

Federal Facility Compliance Act (FFCA Act)

*Approved Site Treatment Plan
Executive Summaries*



October 1995

Ames Laboratory

Executive Summary/Update

As required by the Federal Facility Compliance Act, a Proposed Site Treatment Plan was submitted for Ames Laboratory in March, 1995. Prior to this submittal, Ames Laboratory completed the Conceptual Site Treatment Plan and Draft Site Treatment Plan in October, 1993 and August, 1994, respectively. The Proposed Site Treatment Plan was submitted to the cognizant regulatory agency, which is the Region VII, EPA.

Since the submission of the Plan, the very small amount of mixed waste at the Laboratory has been treated in accordance with the regulations and no mixed waste is now at the site. As a result, Ames Laboratory is now in compliance with the applicable Resource Conservation and Recovery Act (RCRA) Land Disposal Restrictions for mixed waste. It is expected that any future mixed waste will be treated and disposed in compliance with RCRA Land Disposal Regulations.

The following identifies the two waste streams that may be generated but will be treated in compliance with the regulations.

Waste Name	Treatment	Inventory
Acidic Aqueous Liquids	Neutralization/Stabilization	0.0
Contaminated Lead	Decontamination	0.0

Future action regarding a Consent Order is being discussed with EPA.

ARGONNE NATIONAL LABORATORY-EAST

Executive Summary/Update

The Federal Facility Compliance Act requires the Department of Energy (DOE) to prepare Site Treatment Plans for how mixed waste, waste containing both hazardous and radioactive components, will be treated. More specifically, the FFCAct requires each individual DOE site that stores or generates mixed waste to develop a Site Treatment Plan. Each site's Plan must provide a list or inventory of mixed waste, treatment technology required and the approach or treatment facility that will be used to treat the waste. After completed, the site's plan is then submitted to the cognizant state agency or Regional EPA office for review and approval, approval with modification or disapproval. For Argonne National Laboratory-East the Plan was submitted to the Illinois Department of Nuclear Safety and the Illinois Environmental Protection Agency for their review and approval in March 1995.

This Plan is the result of a three part planning process consisting of Conceptual, Draft and this Proposed Plan. The Conceptual Plan was completed in October 1993. In general, that document provided a mixed waste inventory, identified potential treatment technologies and a range of treatment options. The Draft Plan, completed in August 1994, represented the second stage of the process in which the treatment options identified in the Conceptual Plan were narrowed down to a few or only one preferred option for each waste stream. The Proposed Plan is the final stage of the planning process and provides the preferred option and treatment schedule for each waste stream.

Currently, DOE is working with the State agencies to finalize an Implementing Agreement for this Plan. In a letter to DOE, the State has recognized that DOE is working in good faith to finalize this agreement. DOE is working with the state agencies involved to finalize the Implementing Agreement as soon as possible.

The Proposed Plan, like the Draft Plan consists of two major sections or volumes: Background Volume and Plan Volume. The Background Volume provides a more extensive discussion while the Plan Volume is a much shorter and focused document.

The Background Volume consists of the following eight sections:

- Section 1 Introduction. This discusses the Purpose and Scope, Site History and Mission, Framework for Developing the Site Treatment Plans, The Proposed Plan Organization and Related Activities.
- Section 2 Methodology. This includes discussions of Assumptions, Preferred Selection Process, Coordination with Regulatory Agencies and Other Stakeholders, Characterization of Mixed Waste and Waste Minimization.

- Section 3 Low-Level Mixed Waste Stream. This provides for each mixed waste stream, a discussion of each mixed waste stream, treatment technology needed and the preferred option.
- Sections 4 and 5 TRU Mixed Waste and High-Level Mixed Waste Stream. If applicable this provides information on these waste streams.
- Section 6 Future Generation of Mixed Waste. Identifies, as possible, mixed waste not discussed in Section 3 that could result from future restoration or site remediation activities.
- Section 7 Storage Report. Discusses the adequacy of the sites mixed waste storage facilities.
- Section 8 Process for Evaluating Disposal Issues in Support of the Site Treatment Plan. This summaries the overall DOE activity in the area of disposal of mixed waste treatment residuals.

The Plan Volume is a shorter and more focused document providing administrative and legal language for implementing the Plan.

The above discussion provided an overview of the FFCAct, planning and Plan review and approval preview and approval process and format of the Proposed Plan. The important feature of the Plan is the discussion of the waste streams and treatment options. The following Table provides a summary matrix which identifies each waste stream, the respective preferred treatment option and inventory.

SITE WASTE/TREATMENT MATRIX

<u>Waste Name</u>	<u>Proposed Treatment</u>	<u>Inventory</u>
Acidic and MLLW Wastewater with Metals	Neutralization/ Precipitation	4.86 m ³
Acidic Wastewater without Metals	Neutralization/ Precipitation	0.66 m ³
MLLW Wastewater with Organics	Neutralization/ Precipitation	0.07 m ³
Organic Solvents	Wet Oxidation	3.00 m ³
Evaporator/ Concentrator Sludges	Vitrification	4.10 m ³
Retention Tank Sludges	Vitrification	1.00 m ³
Soil with Metals	Vitrification	0.86 m ³

Glass with Metals	Vitrification	0.04 m ³
Glass with Organics	Vitrification	0.01 m ³
Paint Chips	Macroencapsulation/ Stabilization	0.00 m ³
Inorganic Solids with Chromium	Macroencapsulation/ Stabilization	0.00 m ³
Combustible Solids with Metals	Macroencapsulation/ Stabilization	0.28 m ³
Metal with RCRA Metals and Stainless Steel with Metals	Surface Decontamination	0.62 m ³
Lead Shielding	Surface Decontamination	7.93 m ³
Stored Lead Waste	Surface Decontamination	10.00 m ³
Reactive Alkali Metals	Alkali Metal Passivation	0.53 m ³
Combustible Solids with Organics	TSCA Incinerator (Oak Ridge)	0.51 m ³

Also as noted above, Chapter 3 of the Background Volume provides more detail on each of the items in this matrix.

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EXECUTIVE SUMMARY

The Federal Facility Compliance Act (FFCA) requires the Department of Energy to prepare Site Treatment Plans for how mixed waste, waste containing both hazardous and radioactive components, will be treated. More specifically, the FFCA requires each individual DOE site that stores or generates mixed waste to develop a Site Treatment Plan. Each site's Plan or activity must provide a list or inventory of mixed waste, treatment technology required and the approach or treatment facility that will be used to treat the waste. The site's Plan is then submitted to the cognizant state agency or Regional EPA office for review and approval, approval with modification, or disapproval. For the Battelle Columbus Laboratories, the Plan is being submitted to the Ohio Environmental Protection Agency for review and approval.

This Plan is a result of a three-part planning process consisting of Conceptual, Draft, and this Proposed Plan. The Conceptual Plan was completed in October 1993. In general, that document provided a mixed waste inventory, identified potential treatment technologies and a range of treatment options. The Draft Plan, completed in August 1994, represented the second stage of the process in which the treatment options identified in the Conceptual Plan were narrowed down to few or only one preferred option for each waste stream. The Proposed Plan is the final stage of the planning process and provides the preferred option and treatment schedule of each waste stream.

The Proposed Plan, like the Draft Plan, consists of two major sections or volumes: Background Volume and Compliance Plan Volume. The Background Volume provides a more extensive discussion while the Compliance Plan Volume is a much shorter and focused document.

The Background Volume consists of the following eight sections:

- **Section 1. Introduction.** This in turn discusses the Purpose and Scope, Site History and Mission, Framework for Developing the Site Treatment Plans, The Proposed Plan Organization, and Related Activities.
- **Section 2. Methodology.** This includes discussions of Assumptions, Preferred Selection Process, Coordination with Regulatory Agencies and Other Stakeholder, Characterization of Mixed Waste and Waste Minimization.
- **Section 3. Low Level Mixed Waste Stream.** This provides, for each mixed waste stream, a description of characteristics and volume, treatment technology needed, and the preferred treatment option.
- **Sections 4 and 5. TRU Mixed Waste and High Level Mixed Waste Stream.** If applicable, this provides information on these waste streams.

- **Section 6. Future Generation of Mixed Waste.** Identifies, as possible, mixed waste not discussed in Section 3 that could result from future restoration or site remediation activities.
- **Section 7. Storage Report.** Discusses the adequacy of the site's mixed waste storage facilities.
- **Section 8. Process for Evaluating Disposal Issues in Support of the STP.** This summarizes the overall DOE activity in the area of disposal of mixed waste treatment residuals.

The Plan Volume is a shorter and more focused document consisting of the following sections:

- **Section 1. Purpose and Scope of the Compliance Plan.**
- **Section 2. Implementation of the Site Treatment Plan.** This provides administrative language for the Plan referencing a Director's Findings and Orders issued by the Ohio Environmental Protection Agency.
- **Section 3. Low Level Mixed Waste Schedules.** For each mixed waste stream and option, identifies milestones and target dates.

The following table provides a summary matrix which identifies each waste stream, the respective preferred treatment option, and inventory.

Site Waste/Treatment Matrix

Waste Name	Preferred Treatment	Total Volume (Actual + Projected) (m ³)
BC-W001 Inorganic Lab Packs	Envirocare of Utah	0.0203
BC-W002 Organic Lab Packs	ORNL TSCA Incinerator	0.017
BC-W003 Elemental Lead	Envirocare of Utah	1.304
BC-W004 Mercury Contaminated Drainlines	Hanford WRAP I	12.000

Also as noted above, Chapter 3 of the Background Volume provides more detail on each of the items in this matrix.

This plan has been reviewed extensively with the staff of Ohio EPA, and has been made available to interested members of the public on request.

EXECUTIVE SUMMARY FOR THE BETTIS PROPOSED SITE TREATMENT PLAN

The Federal Facility Compliance Act of 1992 (FFCA) requires the U.S. Department of Energy (DOE) to prepare Site Treatment Plans (STPs) to address treatment of mixed radioactive and hazardous waste for each DOE site which generates and stores mixed waste. These plans are to be submitted to the states (or the U.S. Environmental Protection Agency (EPA) in cases where the state has not been delegated authority to regulate mixed waste) for approval. Owing to the joint Navy/DOE nature of the Naval Nuclear Propulsion Program (NNPP) and pursuant to the legislative history of the FFCA, NNPP facilities which generate and store mixed waste, including Bettis Atomic Power Laboratory (Bettis), are included in the FFCA process and have prepared STPs. The Bettis Proposed Site Treatment Plan (PSTP) is being provided to EPA Region III for approval in accordance with the FFCA.

Bettis generates very small amounts of mixed waste as a result of design and development of Naval nuclear propulsion plants. On December 31, 1994, Bettis had approximately 11.73 cubic meters of mixed waste in storage, 25.96 cubic meters of mixed waste undergoing on-site processing, and projected to generate approximately 1208.41 cubic meters over the next five years (4.06 cubic meters of the 1208.41 cubic meters was expected to be placed in storage pending availability of treatment following completion of on-site processing). These amounts represent less than 0.48 percent of the total amount of mixed waste stored and generated at DOE facilities.

As outlined in an April 6, 1993 Federal Register notice (58 FR 17875, as modified in 60 FR 10840, February 28, 1995), the STPs were developed in three stages. Conceptual Site Treatment Plans (CSTPs), which identified the range of potentially feasible treatment options for each mixed waste stream, were completed and submitted to state and EPA regulators in October 1993. Draft Site Treatment Plans (DSTPs), completed and submitted to state and EPA regulators in August 1994, discussed the evaluation of treatment options and identified the site's preferred treatment option for each waste stream. PSTPs, which contain DOE's preferred options developed after evaluation and integration with the site specific options in other sites' DSTPs, are being submitted to state and EPA regulators in March 1995. This three step process was intended to facilitate early interaction with the regulators and other stakeholders to maximize the likelihood that the STPs will ultimately be approved by October 1995 as required by the FFCA.

Prior to submittal of the DSTPs in August 1994, Bettis determined preferred treatment options for each waste stream by comparing all feasible treatment options (including on-site treatment, use of mobile treatment systems, commercial treatment, and treatment at other DOE facilities) in several fundamental areas (including regulatory compliance, treatment effectiveness, environment/health/safety concerns, cost, and implementability). This approach was used by all sites. Based on the small volumes of Bettis waste streams requiring treatment following completion of on-site processing, these evaluations indicated that off-site

treatment at other DOE facilities is economically and technically preferable to other options. Bettis identified potentially technically capable DOE facilities for each waste stream based on an evaluation of available treatment facility information, then coordinated with the other DOE sites to confirm treatment capability and select preferred options. Several of the preferred treatment options now identified in the PSTP have been changed from those identified in the DSTP based on further evaluations to resolve technical uncertainties and based on the DOE Options Analysis Team (OAT) evaluations to improve the efficiency of the complex wide treatment configuration.

In addition to identifying the proposed treatment option for each Bettis mixed waste stream, the PSTP also identifies proposed schedules for shipment of each waste stream to the selected treatment facility, and proposed arrangements for pre-treatment storage and post-treatment residual management for each waste stream. A single schedule milestone, for shipment to the treatment facility within 18 or 24 months of the start of facility operations, is proposed for each waste stream. Thus, pre-treatment storage on-site at Bettis until the selected treatment facilities are available is proposed. Projected schedules for the start of operation of selected treatment facilities are identified, except where this information was not available for inclusion in the PSTP. The PSTP also proposes commitments to perform additional evaluations and work with the EPA Region III to determine whether alternative treatment options should be selected in the event completion of a targeted treatment facility is delayed (or in the event the initial projected schedule is not acceptable for cases where a projected schedule is not currently available).

The following table contains a listing of the mixed waste streams and proposed treatment options identified in the Bettis PSTP. The table also identifies the proposed schedule milestones, projected shipping dates, and estimated costs for implementing each proposed treatment option. If the targeted treatment facilities are completed according to currently identified schedules, many of Bettis' mixed waste streams will be treated by 1998, and the total cost for treating all waste streams will be about \$576,000. Bettis and the NNPP believe the Bettis PSTP balances the concerns of expeditious completion of treatment, cost/efficiency, minimizing shipments, and minimizing risk/liability, and represents the best overall plan for achieving compliance with Land Disposal Restriction requirements for Bettis mixed waste.

Waste Stream ID #	Waste Stream Name	Current Inventory (M3)	5 Year Projected Inventory (M3)	Preferred Option	Facility Name	Projected Start Date of Facility Operation	Proposed Milestone	Projected Shipping Date	Estimated Cost
BT-W001	Oil Containing Heavy Metals #1	0.21	0.21	SR-S018	Savannah River CIF	Feb. 1996	Start of ops. + 24 months	Feb. 1998	\$7,748
BT-W002	Spent Solvent Rags	0.21	0.00	SR-S018	Savannah River CIF	Feb. 1996	Start of ops. + 24 months	Feb. 1998	\$7,379
BT-W003	Oil Containing Heavy Metals #2	0.73	0.21	SR-S018	Savannah River CIF	Feb. 1996	Start of ops. + 24 months	Feb. 1998	\$13,557
BT-W005	Lead and Chromium Based Paint Chips	0.10	0.10	IN-S015	INEL IWPF Incinerator	Not Available	Start of ops. + 18 months	Not Available	\$17,723
BT-W007	Solids with Solvents	0.42	0.00	SR-S018	Savannah River CIF	Feb. 1996	Start of ops. + 24 months	Feb. 1998	\$8,806
BT-W008	Mercury Containing Waste	0.00	0.02	IN-S128	INEL WEDF Mercury Retort Facility	Apr. 2000	Start of ops. + 18 months	Oct. 2001	\$17,382
BT-W009	VOC Contaminated Soil	0.63	0.00	IN-S015	INEL IWPF Incinerator	Not Available	Start of ops. + 18 months	Not Available	\$28,849
BT-W010	Waste Oil with Heavy Metals, PCBs and VOCs	0.26	0.00	IN-S015	INEL IWPF Incinerator	Not Available	Start of ops. + 18 months	Not Available	\$19,622
BT-W012	VOC and PCB Contaminated Debris	1.68	0.42	IN-S015	INEL IWPF Incinerator	Not Available	Start of ops. + 18 months	Not Available	\$49,203
BT-W013	VOC and PCB Contaminated Soil	0.84	0.00	IN-S015	INEL IWPF Incinerator	Not Available	Start of ops. + 18 months	Not Available	\$23,062
BT-W017	Ion Exchange Resin	0.001	0.00	IN-S143	INEL IWPF RH Incinerator	Not Available	Start of ops. + 18 months	Not Available	\$24,082
BT-W018	TCLP Extraction Fluid	0.00	0.001	SR-S018	Savannah River CIF	Feb. 1996	Start of ops. + 24 months	Feb. 1998	\$6,972
BT-W019	Elemental Lead	1.16	0.53	IN-S034	INEL NWCF Debris Treatment Facility	Oct. 2000	Start of ops. + 18 months	Apr. 2002	\$80,789
BT-W020	Brass and Bronze	0.00	0.05	IN-S016	INEL IWPF Macroencapsulation Unit	Not Available	Start of ops. + 18 months	Not Available	\$18,103
BT-W028	VOC and PCB Contaminated Water	2.10	0.63	IN-S015	INEL IWPF Incinerator	Not Available	Start of ops. + 18 months	Not Available	\$72,991
BT-W029	VOC Contaminated Sediments/Sludge	0.42	0.63	IN-S015	INEL IWPF Incinerator	Not Available	Start of ops. + 18 months	Not Available	\$41,668
BT-W030	VOC Contaminated Debris	0.21	0.21	IN-S015	INEL IWPF Incinerator	Not Available	Start of ops. + 18 months	Not Available	\$18,018
BT-W031	VOC and PCB Contaminated Sludge	2.73	1.05	IN-S015	INEL IWPF Incinerator	Not Available	Start of ops. + 18 months	Not Available	\$102,819
BT-W033	Ignitable Liquid	0.03	0.00	IN-S005	INEL WERF Incinerator	Jan. 1996	Start of ops. + 18 months	Jul. 1997	\$17,723

Proposed Site Treatment Plan Brookhaven National Laboratory

Executive Summary/Update

The Federal Facility Compliance Act (FFCA) requires the Department of Energy to prepare Site Treatment Plans for how mixed waste, waste containing both hazardous and radioactive components, will be treated. More specifically, the FFCA requires each individual DOE site that stores or generates mixed waste to develop a Site Treatment Plan. Each site's Plan must provide a list or inventory of mixed waste, treatment technology required and the approach or treatment facility that will be used to treat the waste. After completed, the site's plan is then submitted to the cognizant state agency or Regional EPA office for review and approval, approval with modification or disapproval. For Brookhaven National Laboratory (BNL) the Plan was submitted to the New York State Department of Environmental Conservation (NYSDEC) for this review in March 1995.

This Plan is the result of a three part planning process consisting of Conceptual, Draft and this Proposed Plan. The Conceptual Plan was completed in October, 1993. In general, that document provided a mixed waste inventory, identified potential treatment technologies and a range of treatment options. The Draft Plan, completed in August 1994, represented the second stage of the process in which the treatment options identified in the Conceptual Plan were narrowed down to few or only one preferred option for each waste stream. The Proposed Plan is the final stage of the planning process and provides the preferred option and treatment schedule for each waste stream.

Currently, DOE is working with the State of New York Department of Environmental Conservation to finalize a Consent Order for the actions identified in this Plan. This is expected to be completed in October, 1995.

The Proposed Plan, like the Draft Plan consists of two major sections or volumes: Background Volume and Compliance Plan Volume. The Background Volume provides a more extensive discussion while the Plan Volume is a much shorter and focused document.

The Background Volume consists of the following eight sections:

- Section 1, Introduction - This in turn discusses the Purpose and Scope, Site History and Mission, Framework for Developing the Site Treatment Plans, the Proposed Plan Organization and Related Activities.
- Section 2, Methodology - This includes discussions of Assumptions, Preferred Selection Process, Coordination with Regulatory Agencies and Other Stakeholders, Characterization of Mixed Waste and Waste Minimization.
- Section 3, Low Level Mixed Waste Streams - This provides, for each mixed waste stream, a discussion of each mixed waste stream, treatment technology needed and the preferred option.

- Sections 4 and 5, TRU Mixed Waste and High Level Mixed Waste Stream - If applicable this provides information on these waste streams.
- Section 6, Future Generation of Mixed Waste - Identifies, as possible, mixed waste not discussed in Section 3 that could result from future restoration or site remediation activities.
- Section 7, Storage Report - Discusses the adequacy of the sites mixed waste storage facilities.
- Section 8, Process for Evaluating Disposal Issues in Support of the STP - This summarizes the overall DOE activity in the area of disposal of mixed waste treatment residuals.

The Compliance Plan Volume is a shorter and more focused document consisting of the following Sections:

- Section 1, Purpose and Scope of the Compliance Plan.
- Section 2, Implementation of the Site Treatment Plan - This summarizes administrative language for the plan.
- Section 3, Low Level Mixed Waste Schedules - For each mixed waste stream and option identifies milestones and target dates.

The above discussion provided an overview of FFCAct, planning and plan review and approval process and format of the Proposed Plan. The important feature of the Plan is the discussion of the waste streams and treatment options. The following Table provides a summary matrix which identifies each waste stream, the respective preferred treatment option and inventory (as of 8/95).

SITE Waste/Treatment Matrix

Waste Name	Preferred Treatment	Inventory(m ³)
Ignitable Waste (BN-W001)	Commercial Facility; Incineration	1.7
Corrosive Waste (BN-W002)	On-Site Neutralization	0.34
Reactive Waste (BN-W003)	Commercial Facility, Stabilization	0.02
Spent Solvents (BN-W004)	Oak Ridge TSCA Incinerator; Incineration	0.91
Chromium Waste (BN-W005)	Commercial Facility; Stabilization	6.4

Lead Waste (BN-W006)	Commercial Facility, Stabilization	0.6
Mercury Waste (BN-W007)	WROC Amalgamation & Retorting Facilities, INEL	0.65
Acutely Hazardous (BN-W008)	On-Site destruction; Cyanide destruction	<0.001
PCB Waste (BN-W011)	Oak Ridge TSCA Incinerator; Incineration	1.3

Also as noted above, Chapter 3 of the Background Volume provides more detail on each of the items in this matrix.

EXECUTIVE SUMMARY FOR THE CNS PROPOSED SITE TREATMENT PLAN

The Federal Facility Compliance Act of 1992 (FFCAct) requires the U.S. Department of Energy (DOE) to prepare Site Treatment Plans (STPs) to address treatment of mixed radioactive and hazardous waste for each DOE site which generates and stores mixed waste. These plans are to be submitted to the states (or the U.S. Environmental Protection Agency (EPA) in cases where the state has not been delegated authority to regulate mixed waste) for approval. Owing to the joint Navy/DOE nature of the Naval Nuclear Propulsion Program (NNPP) and pursuant to the legislative history of the FFCAct, NNPP facilities which generate and store mixed waste, including Charleston Naval Shipyard (CNS), are included in the FFCAct process and have prepared STPs. The CNS Proposed Site Treatment Plan (PSTP) is being provided to the South Carolina Department of Health and Environmental Control for approval in accordance with the FFCAct.

CNS generates very small amounts of mixed waste as a result of maintenance and repair work performed on Naval nuclear propulsion plants. CNS currently has approximately 1.97 cubic meters of mixed waste in storage, and projects to generate approximately 6.80 cubic meters prior to scheduled shipyard closure in April 1996. These amounts represent less than 0.003 percent of the total amounts of mixed waste stored and generated at DOE facilities.

As outlined in an April 6, 1993 Federal Register notice (58 FR 17875 as modified in 60 FR 10840, February 28, 1995), the STPs were developed in three stages. Conceptual Site Treatment Plans (CSTPs), which identified the range of potentially feasible treatment options for each mixed waste stream, were completed and submitted to state and EPA regulators in October 1993. Draft Site Treatment Plans (DSTPs), completed and submitted to state and EPA regulators in August 1994, discussed the evaluation of treatment options and identified the site's preferred treatment option for each waste stream. PSTPs, which contain DOE's preferred options developed after evaluation and integration with the site-specific options in other sites' DSTPs, are being submitted to state and EPA regulators in March 1995. This three step process was intended to facilitate early interaction with the regulators and other stakeholders to maximize the likelihood that the STPs will ultimately be approved by October 1995 as required by the FFCAct.

Prior to submittal of the DSTPs in August 1994, CNS determined preferred treatment options for each waste stream by comparing all feasible treatment options (including on-site treatment, use of mobile treatment systems, commercial treatment, and treatment at other DOE facilities) in several fundamental areas (including regulatory compliance, treatment effectiveness, environment/health/safety concerns, cost, and implementability). This approach was used by all sites. Based on the very small volumes of CNS's waste streams, these evaluations indicated that off-site treatment at other DOE facilities is economically and technically preferable to other options. CNS identified potentially technically capable DOE facilities for each waste stream based on an evaluation of available treatment facility information, then coordinated with the other DOE sites to confirm treatment capability and select preferred options. Several of the preferred treatment options now identified in the PSTP have been changed from those identified in the DSTP based on further evaluations to

resolve technical uncertainties and based on the DOE Options Analysis Team (OAT) evaluations to improve the efficiency of the complex wide treatment configuration.

In addition to identifying the proposed treatment option for each CNS mixed waste stream, the PSTP also identifies proposed schedules for shipment of each waste stream to the selected treatment facility, and proposed arrangements for pre-treatment storage and post-treatment residual management for each waste stream. To support base closure schedules, a single schedule milestone, for shipment to the treatment facility by January 1996, is proposed for each CNS waste stream. Thus, pre-treatment storage at the selected treatment facility is proposed. CNS and the NNPP consider support of base closure is sufficient justification for having very small volumes of CNS waste stored at treatment sites prior to the availability of the selected treatment facilities. Projected schedules for the start of operation of selected treatment facilities are identified, except where this information was not available for inclusion in the PSTP.

The CNS PSTP proposes that treatment residuals from CNS mixed waste streams be stored at the treatment sites until DOE complex-wide mixed waste disposal arrangements are established. This proposal is based on supporting CNS's base closure schedule, the very small volumes of CNS's mixed waste streams, the desire to minimize shipments, and technical concerns associated with different radionuclides and hazardous constituents in the residues. Given the very small volumes of CNS's mixed waste streams, these streams will likely be blended with other waste streams at the treatment sites to facilitate treatment. Therefore, treatment residuals will likely be a mixture of CNS's and other sites' residuals which may contain different radionuclides and hazardous constituents from the original CNS waste streams. CNS and the NNPP consider this technical justification supports having very small volumes of treatment residuals remain at the treatment sites vice being returned to CNS.

The following table contains a listing of the mixed waste streams and proposed treatment options identified in the CNS PSTP. The table also identifies the proposed schedule milestones, projected shipping dates, and estimated costs for implementing each proposed treatment option. If the PSTP proposals are approved, all of CNS's mixed waste streams will be shipped to treatment sites by January 1996 to support the base closure schedule, and the total cost for treating all waste streams will be about \$ 188,000. CNS and the NNPP believe the CNS PSTP balances the concerns of expeditious completion of treatment, cost/efficiency, minimizing shipments, and minimizing risk/liability, and represents the best overall plan for achieving compliance with Land Disposal Restriction requirements for CNS mixed waste.

Waste Stream ID #	Waste Stream Name	Current Inventory (M3)	5 Year Projected Inventory (M3)	Preferred Option	Facility Name	Projected Start Date of Facility Operation	Proposed Milestone	Projected Shipping Date	Estimated Cost
CN-W001	Solids Containing Potassium Chromate	0.50	0.60	SR-S018	Savannah River CIF	Feb. 1996	Jan. 1996	Jan. 1996	\$6,903
CN-W002	Lead and Lead Bearing Materials	0.32	3.50	IN-S003	INEL WROC Macroencapsulation Unit	Apr. 1998	Jan. 1996	Jan. 1996	\$85,103
CN-W003	Lead and/or Chromium Based Paint Chips	0.07	0.40	IN-S005	INEL WERF Incinerator	Jan. 1996	Jan. 1996	Jan. 1996	\$21,351
CN-W004	Organic Debris Contaminated with Lead and/or Chromium	0.61	0.90	SR-S018	Savannah River CIF	Feb. 1996	Jan. 1996	Jan. 1996	\$6,270
CN-W005	Cadmium-Plated Metals	0.00	0.50	IN-S003	INEL WROC Macroencapsulation Unit	Apr. 1998	Jan. 1996	Jan. 1996	\$24,355
CN-W006	Brass and Bronze	0.47	0.70	IN-S003	INEL WROC Macroencapsulation Unit	Apr. 1998	Jan. 1996	Jan. 1996	\$39,865
CN-W007	Flammable Organic Debris	0.00	0.20	SR-S018	Savannah River CIF	Feb. 1996	Jan. 1996	Jan. 1996	\$4,020

PROPOSED SITE TREATMENT PLAN FOR THE COLONIE INTERIM STORAGE SITE

EXECUTIVE SUMMARY

The Colonie Interim Storage Site (CISS) is a DOE-owned facility located in Colonie, New York. The site is used for interim storage of low-level radioactive waste material generated by former industrial activities. Before the U.S. Department of Energy (DOE) assumed ownership of CISS, waste regulated under the Resource Conservation and Recovery Act (RCRA) was identified and stored at the site under a Part A RCRA Interim Status Permit application filed with the New York State Department of Environmental Conservation (NYSDEC). A RCRA closure plan recently developed by DOE and approved by NYSDEC described methods and schedules for removing all the wastes identified on the Part A permit application and cleaning up the associated RCRA storage areas.

RCRA, Section 3021(b), as amended by Section 105(a) of the Federal Facility Compliance Act (FFCA), requires DOE to develop and submit a plan for identifying and applying technologies and capacities to treat mixed waste generated or stored at DOE facilities. This plan is to be submitted to the appropriate state or the Environmental Protection Agency (EPA). Mixed waste generated at DOE sites must be treated or otherwise managed in accordance with RCRA land disposal restriction standards. After the plan is submitted to NYSDEC, the FFCA requires the recipient regulatory agency to solicit and consider public comments, and approve, approve with modification, or disapprove the plan within six months of receipt. The regulatory agency must then issue an order requiring compliance with the approved plan.

The plan is divided into a background volume and a compliance plan volume. The background volume identifies waste streams for which treatment options are needed, lists the preferred options for treatment, and provides information for the compliance plan volume. The compliance plan volume provides schedules with milestones and target dates for achieving compliance with land disposal restrictions. The compliance plan volume for CISS has not been included at this time because a final remedy for the site has not been selected. After a remedy is selected, the background volume will be amended to reflect any additional waste streams, and the compliance plan volume will be developed for submittal to appropriate regulators. This approach for fulfilling the purposes of the FFCA has been proposed by DOE to NYSDEC, the agency responsible for final approval.

Future waste streams identified as a result of ongoing remedial actions will be characterized for inclusion in the final remedy documentation for the site, expected to be published by September 1995.

SITE TREATMENT PLAN FOR THE ENERGY TECHNOLOGY ENGINEERING CENTER CANOGA PARK, CALIFORNIA

EXECUTIVE SUMMARY

Purpose of the Site Treatment Plan

The Proposed Site Treatment Plan (PSTP) for U.S. Department of Energy Oakland Operations Office (DOE/OAK) mixed wastes at the Energy Technology Engineering Center (ETEC) was written in response to the Federal Facility Compliance Act (FFCA). The FFCA requires that site treatment plans (STPs or plans) be developed for facilities at which the U.S. Department of Energy (DOE) generates or stores mixed waste. Mixed waste is defined by the FFCA as any waste containing both a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA), and source, special nuclear, or by-product material subject to the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.).

On April 6, 1993, DOE published *The Schedule for Submitting Plans for the Treatment of Mixed Waste Generated or Stored at Each Site* in the *Federal Register* (58 FR 17875, DOE, 1993a) describing its proposed process for developing the site treatment plans. The plans would be developed in three phases: conceptual, draft, and proposed. The conceptual plan presented known treatment needs, capabilities, and preliminary options for treating the mixed waste. The purpose of the draft plan was to identify site-specific preferred options for treating the mixed waste, or for developing technologies where technologies do not exist or need modification. The proposed plan reflects DOE's preferred options, developed with State input and based on existing available information. The options reflect a "bottom-up" approach and have been evaluated for their potential effects on other DOE sites and the overall DOE program. Changes in the preferred options and associated schedules were also made between the draft and proposed site treatment plans as a result of evaluations from the DOE-wide perspective. These may change further as a result of discussions with affected states and public comments before the approval of the PSTP and issuance by the California Department of Toxic Substances Control (DTSC) of an Order (FFCA Order) requiring DOE to implement the STP for each site.

The PSTP consists of the Compliance Plan Volume, and the Background Volume and its Appendices. The Compliance Plan Volume contains the enforceable milestones associated with the preferred treatment options. A more detailed discussion of the preferred treatment options, which is provided for informational purposes only, is presented in the Background Volume and its Appendices.

DOE faces increasingly tight budgets throughout the DOE complex and anticipates that funding will continue to be constrained. The schedules in this and other Plans reflect those constraints. DOE has asked regulatory agencies to work with DOE and other interested parties at the site and National level to assist DOE in prioritizing its activities. Through this process, DOE expects that some schedules will be revised before the Site Treatment Plans are approved and FFCAct Orders issued.

Summary of PSTP Proposed Options

Current inventories of DOE/OAK mixed wastes at ETEC are relatively small, with total quantities not exceeding 10 m³. The largest fraction of this waste consists of potentially contaminated but currently uncharacterized high efficiency particulate air (HEPA) filters and miscellaneous debris and components resulting from decontamination and decommissioning (D&D) activities. Treatment options selected for characterized mixed low-level wastes include offsite shipment for treatment at the Idaho National Engineering Laboratory (INEL) (1.23 m³). Several recently identified mixed waste streams are still undergoing characterization. DOE will propose alternate treatment facilities, including commercial facilities, through the submittal of annual and semi-annual reports and future notices to DTSC.

One potentially mixed transuranic (MTRU) waste stream has been identified, consisting of drain line debris. This waste requires further characterization. MTRU waste streams are expected to be shipped to the Waste Isolation Pilot Project (WIPP); although the schedule dates for shipment are dependent upon development of final WIPP Waste Acceptance Criteria (WAC) and approval of the WIPP No-Migration Variance Petition by the EPA and the State of New Mexico.

ETEC does not expect to generate significant quantities of mixed waste due to environmental restoration (ER) and D&D activities. If mixed wastes are generated that do not meet RCRA Land Disposal Restriction requirements, they will be characterized and addressed in future reports.

SITE TREATMENT PLAN FOR DOE/OAK MIXED WASTES AT THE FORMER LABORATORY FOR ENERGY-RELATED HEALTH RESEARCH DAVIS, CALIFORNIA

EXECUTIVE SUMMARY

Purpose of the Site Treatment Plan

The Proposed Site Treatment Plan (PSTP) for U.S. Department of Energy Oakland Operations Office (DOE/OAK) mixed wastes at the former Laboratory for Energy-Related Health Research (LEHR) was written in response to the Federal Facility Compliance Act (FFCA). The FFCA requires that site treatment plans (STPs or plans) be developed for facilities at which the DOE generates or stores mixed waste. Mixed waste is defined by the FFCA as any waste containing both a hazardous waste subject to the Resource Conservation and Recovery Act (RCRA), and source, special nuclear, or by-product material subject to the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.).

On April 6, 1993, DOE published *The Schedule for Submitting Plans for the Treatment of Mixed Waste Generated or Stored at Each Site* in the *Federal Register* (58 FR 17875, DOE, 1993a) describing its proposed process for developing the site treatment plans. The plans would be developed in three phases: conceptual, draft, and proposed. The conceptual plan presented known treatment needs, capabilities, and preliminary options for treating the mixed waste. The purpose of the draft plan was to identify site-specific preferred options for treating the mixed waste, or for developing technologies where technologies do not exist or need modification. At the time this PSTP was developed, no DOE-related mixed waste was present at the former LEHR site. The proposed plan describes DOE's process for managing mixed wastes that may be generated in the future. For DOE Oakland Operations Office (DOE/OAK) mixed wastes located at sites in California, the plans must be submitted to the State of California Department of Toxic Substances Control (DTSC) for approval, approval with modification, or disapproval.

The PSTP consists of the Compliance Plan Volume, and the Background Volume and its Appendices. The Compliance Plan Volume contains the enforceable milestones associated with the preferred

treatment options. A more detailed discussion of the preferred treatment options, which is provided for informational purposes only, is presented in the Background Volume and its Appendices.

Summary of PSTP Proposed Options

There are currently no DOE/OAK mixed wastes at the former LEHR site (all DOE/OAK mixed low-level wastes (MLLW) were shipped offsite by January 1995). Future generation of DOE/OAK mixed wastes at this site may occur due to ongoing environmental restoration and decontamination and decommissioning activities. Future mixed wastes generated that are subject to the FFCAct and do not meet RCRA Land Disposal Restriction requirements will be characterized and addressed in future reports.

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

PROPOSED SITE TREATMENT PLAN

EXECUTIVE SUMMARY

The U.S. Department of Energy (DOE) is required by Section 3021(b) of the Resource Conservation and Recovery Act (RCRA), as amended by the Federal Facility Compliance Act, to prepare Site Treatment Plans describing the development of treatment capacities and technologies for treating mixed waste. Mixed waste is defined by the Federal Facility Compliance Act as waste containing both a hazardous waste subject to RCRA, and source, special nuclear or by-product material subject to the Atomic Energy Act of 1954 (42 U.S.C. 2011 *et seq.*).

On April 6, 1993, DOE published a Federal Register notice (58 FR 17875) describing the proposed process for developing the Site Treatment Plan in three phases, including a Conceptual Site Treatment Plan, a Draft Site Treatment Plan and a Site Treatment Plan. The Fernald Environmental Management Project (FEMP) Conceptual Site Treatment Plan was submitted to the Ohio Environmental Protection Agency (OEPA) in October 1993. The FEMP Draft Site Treatment Plan was submitted to the OEPA in August 1994. The FEMP Proposed Site Treatment Plan (PSTP) was submitted in March 1995 to the OEPA, the public, the U.S. Environmental Protection Agency (USEPA), and others for review and comment. Upon approval by the OEPA, this plan will be the FEMP Approved Site Treatment Plan to be implemented by DOE.

The PSTP is comprised of two parts: the Background Volume and the Plan Volume. The Background Volume identifies the Preferred Options for mixed waste treatment and provides information supporting the selection of those options, while the Plan Volume shows the schedules for activities necessary to implement the Preferred Options.

The FEMP's PSTP focuses on treatment of mixed low level waste currently in storage (2,389.3 m³) and similar waste expected to be generated over the next five years (1227 m³). These quantities are presented by FEMP Preferred Option on the following page. Wastes generated at the FEMP resulted from the facility's original mission to process uranium ore concentrates into high purity uranium metal products. A wide variety of chemical and metallurgical process steps supported manufacturing of uranium metal products for use at other DOE sites. On July 10, 1989, after more than 36 years of manufacturing uranium metal products for U.S. Defense Programs, production operations were suspended to focus site resources on environmental remediation and waste management.

The remediation process is being conducted in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). Additional requirements for mixed waste management which will impact the FEMP's PSTP are established in the Amended Consent Agreement, signed by USEPA and DOE, and the Consent Decree and its Stipulated Amendment, entered into by the State of Ohio and DOE.

The DOE has a Preferred Option for each mixed low level waste stream identified in the FEMP inventory. All of these FEMP mixed low level waste streams can be treated using an existing technology. The Preferred Options include: use of existing on-site equipment and facilities, emphasis on vendor provided mobile treatment, use of an existing DOE facility (for incineration of liquid waste streams only), and use of a commercial disposal facility. Any wastes characterized as mixed low level waste in the future will be subject to the management process established in the Proposed Site Treatment Plan. Management options for remediation wastes to be generated will be incorporated into the Plan Volume after they have been finalized through the CERCLA process and are not reflected in this version of the Proposed Site Treatment Plan. Updates to the Site Treatment Plan will reflect remediation wastes as they are generated.

Battelle Columbus Laboratory had identified one mixed waste stream to be treated at the FEMP using the Ohio Mobile Stabilization System Preferred Option.

Battelle Columbus Laboratory will be changing their PSTP so that the FEMP will not be identified as the preferred option for waste treatment. Battelle is planning to name the FEMP as an alternate treatment option for one waste stream.

Additional mixed waste may be identified for treatment at the FEMP from Nevada Test Site (NTS). Information on this waste stream is preliminary. The FEMP is evaluating the waste stream for treatment in FEMP preferred options. The waste stream from NTS consists of 249 m³ of cotten concentrate with selenium and natural uranium ore.

The Proposed Site Treatment Plan reflects the site-specific preferred options developed with stakeholder input and is based on existing available information. As reflected in the Plan Volume, treatment of mixed wastes streams currently in inventory is scheduled to be completed in 2001. However, DOE faces increasingly tight budgets throughout the DOE complex and anticipates that funding will continue to be constrained. DOE has asked regulatory agencies to work with DOE and other interested parties at the site and National level to assist DOE in prioritizing its activities. Through this process, DOE expects that some schedules will be revised before the Site Treatment Plans are approved and orders issued.

Emerging technologies or new facilities that provide opportunities to manage waste more safely, effectively, and at lower cost will be evaluated as they are identified. Working closely with stakeholders during the implementation of the Plan, DOE will continue to evaluate technologies that offer potential advantages in the areas of public acceptance, risk abatement, performance and life cycle cost. Should better technology options be identified, DOE may request a plan modification in accordance with provisions of the implementing Federal Facility Compliance Act.

FEMP PREFERRED OPTIONS	CURRENT QUANTITY OF WASTE IN m ³	PROJECTED 5 YEAR RATE OF WASTE IN m ³
HF Neutralization System	0.0	0
UNH Treatment System	874.5	0
Thorium Nitrate Treatment System	22.0	0
Wastewater Treatment	36.0	6
Ohio Mobile Stabilization System	237.7	288
Ohio Mobile Chemical Treatment System	649.6	72
TSCA Incinerator	536.9	327
Envirocare*	32.6	534

Please see Appendix C, Supplement for the detail on the revised estimated total of mixed waste to be treated by each Preferred Option.

- * The quantity of mixed low level waste specified for Envirocare does not require treatment prior to disposal. The waste will be shipped from the FEMP to Envirocare for final disposition.

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SITE TREATMENT PLAN FOR DOE MIXED WASTES AT GENERAL ATOMICS SAN DIEGO, CALIFORNIA

EXECUTIVE SUMMARY

Purpose of the Site Treatment Plan

The Proposed Site Treatment Plan (PSTP) for U.S. Department of Energy Oakland Operations Office (DOE/OAK) mixed wastes at General Atomics (GA) was written in response to the Federal Facility Compliance Act (FFCAct). The FFCAct requires that site treatment plans (STPs or plans) be developed for facilities at which DOE generates or stores mixed waste. Mixed waste is defined by the FFCAct as any waste containing both a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA), and source, special nuclear, or by-product material subject to the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.).

On April 6, 1993, DOE published *The Schedule for Submitting Plans for the Treatment of Mixed Waste Generated or Stored at Each Site* in the *Federal Register* (58 FR 17875, DOE, 1993a) describing its proposed process for developing the site treatment plans. The plans would be developed in three phases: conceptual, draft, and proposed. The conceptual plan presented known treatment needs, capabilities, and preliminary options for treating the mixed waste. The purpose of the draft plan was to identify site-specific preferred options for treating the mixed waste, or for developing technologies where technologies do not exist or need modification. The proposed plan reflects DOE's preferred options, developed with State input and based on existing available information. The options reflect a "bottom-up" approach and have been evaluated for their potential affects on other DOE sites and the overall DOE program. Changes in the preferred options and associated schedules were also made between the draft and proposed site treatment plans as a result of evaluations from the DOE-wide perspective. These may change further as a result of discussions with affected states and public comments before the approval of the PSTP and issuance by the California Department of Toxic Substances Control (DTSC) of an Order (FFCAct Order) requiring DOE to implement the STP for each site.

The PSTP consists of the Compliance Plan Volume, and the Background Volume and its Appendices. The Compliance Plan Volume contains the enforceable milestones associated with the preferred treatment

options. A more detailed discussion of the preferred treatment options, which is provided for informational purposes only, is presented in the Background Volume and its Appendices.

DOE faces increasingly tight budgets throughout the DOE complex and anticipates that funding will continue to be constrained. The schedules in this and other Plans reflect those constraints. DOE has asked regulatory agencies to work with DOE and other interested parties at the site and National level to assist DOE in prioritizing its activities. Through this process, DOE expects that some schedules will be revised before the Site Treatment Plans are approved and FFCAct Orders issued.

Summary of PSTP Proposed Options

Current inventories of characterized DOE/OAK mixed wastes to be treated onsite at GA consist of contaminated waste waters (approximately 22 m³) resulting from the New Production Reactor (NPR) program and Hot Cell decontamination and decommissioning (D&D) activities. Current inventories of DOE/OAK mixed wastes to be treated offsite at Hanford are relatively small, with total quantities not exceeding 2.7 m³. Several recently identified mixed waste streams are still undergoing characterization. DOE will propose alternate treatment facilities, including commercial facilities, through the submittal of annual and semi-annual reports and future notices to DTSC.

Future generation of small quantities of DOE/OAK mixed wastes at GA is expected due to continued D&D and research activities. Future mixed wastes generated that do not meet RCRA Land Disposal Restriction requirements will be characterized and addressed in future reports.

IDAHO NATIONAL ENGINEERING LABORATORY

TO BE PROVIDED

EXECUTIVE SUMMARY FOR THE KAPL-KESSELRING PROPOSED SITE TREATMENT PLAN

The Federal Facility Compliance Act of 1992 (FFCA) requires the U.S. Department of Energy (DOE) to prepare Site Treatment Plans (STPs) to address treatment of mixed radioactive and hazardous waste for each DOE site which generates and stores mixed waste. These plans are to be submitted to the states (or the U.S. Environmental Protection Agency (EPA) in cases where the state has not been delegated authority to regulate mixed waste) for approval. Owing to the joint Navy/DOE nature of the Naval Nuclear Propulsion Program (NNPP) and pursuant to the legislative history of the FFCA, NNPP facilities which generate and store mixed waste, including Knolls Atomic Power Laboratory-Kesselring Site (KAPL-Kesselring), are included in the FFCA process and have prepared STPs. The KAPL-Kesselring Proposed Site Treatment Plan (PSTP) is being provided to the New York State Department of Environmental Conservation for approval in accordance with the FFCA.

KAPL-Kesselring generates very small amounts of mixed waste as a result of research and development for the design and operation of Naval nuclear propulsion plants. KAPL-Kesselring currently has approximately 1.82 cubic meters of mixed waste in storage, 0.45 cubic meters of mixed waste undergoing on-site processing and projects to generate approximately 45.45 cubic meters over the next five years (16.73 cubic meters of the 45.45 cubic meters is expected to be placed in storage pending availability of treatment following completion of on-site processing). These amounts represent less than 0.024 percent of the total amount of mixed waste stored and generated at DOE facilities.

As outlined in an April 6, 1993 Federal Register notice (58 FR 17875 as modified in 60 FR 10840, February 28, 1995), the STPs were developed in three stages. Conceptual Site Treatment Plans (CSTPs), which identified the range of potentially feasible treatment options for each mixed waste stream, were completed and submitted to state and EPA regulators in October 1993. Draft Site Treatment Plans (DSTPs), completed and submitted to state and EPA regulators in August 1994, discussed the evaluation of treatment options and identified the site's preferred treatment option for each waste stream. PSTPs, which contain DOE's preferred options developed after evaluation and integration with the site-specific options in other sites' DSTPs, are being submitted to state and EPA regulators in March 1995. This three step process was intended to facilitate early interaction with the regulators and other stakeholders to maximize the likelihood that the STPs will ultimately be approved by October 1995 as required by the FFCA.

Prior to submittal of the DSTPs in August 1994, KAPL-Kesselring determined preferred treatment options for each waste stream by comparing all feasible treatment options (including on-site treatment, use of mobile treatment systems, commercial treatment, and treatment at other DOE facilities) in several fundamental areas (including regulatory compliance, treatment effectiveness, environment/health/safety concerns, cost, and implementability). This approach

was used by all sites. Based on the very small volumes of KAPL-Kesselring waste streams requiring treatment following completion of on-site processing, these evaluations indicated that off-site treatment at other DOE facilities is economically and technically preferable to other options. KAPL-Kesselring identified potentially technically capable DOE facilities for each waste stream based on an evaluation of available treatment facility information, then coordinated with the other DOE sites to confirm treatment capability and select preferred options. Several of the preferred treatment options now identified in the PSTP have been changed from those identified in the DSTP based on further evaluations to resolve technical uncertainties and based on the DOE Options Analysis Team (OAT) evaluations to improve the efficiency of the complex wide treatment configuration.

In addition to identifying the proposed treatment option for each KAPL-Kesselring mixed waste stream, the PSTP also identifies proposed schedules for shipment of each waste stream to the selected treatment facility, and proposed arrangements for pre-treatment storage and post-treatment residual management for each waste stream. A single schedule milestone, for shipment to the treatment facility within 18 or 24 months of the start of facility operations, is proposed for each waste stream. Thus, pre-treatment storage on-site at KAPL-Kesselring until the selected treatment facilities are available is proposed. Projected schedules for the start of operation of selected treatment facilities are identified, except where this information was not available for inclusion in the PSTP. The PSTP also proposes commitments to perform additional evaluations and work with the New York State Department of Environmental Conservation to determine whether alternative treatment options should be selected in the event completion of a targeted treatment facility is delayed (or in the event the initial projected schedule is not acceptable for cases where a projected schedule is not currently available).

The following table contains a listing of the mixed waste streams and proposed treatment options identified in the KAPL-Kesselring PSTP. The table also identifies the proposed schedule milestones, projected shipping dates, and estimated costs for implementing each proposed treatment option. If the targeted treatment facilities are completed according to currently identified schedules, the majority of KAPL-Kesselring's mixed waste streams will be treated by 2001, and the total cost for treating all waste streams will be about \$565,000. KAPL-Kesselring and the NNPP believe the KAPL-Kesselring PSTP balances the concerns of expeditious completion of treatment, cost/efficiency, minimizing shipments, and minimizing risk/liability, and represents the best overall plan for achieving compliance with Land Disposal Restriction requirements for KAPL-Kesselring mixed waste.

Waste Stream ID #	Waste Stream Name	Current Inventory (M3)	5 Year Projected Inventory (M3)	Preferred Option	Facility Name	Projected Start Date of Facility Operation	Proposed Milestone	Projected Shipping Date	Estimated Cost
KK-W002	Cadmium-Plated Solids	0.02	1.00	RL-S007	Hanford WRAP IIA Facility	Sep. 1999	Start of ops. + 18 months	Mar. 2001	\$27,526
KK-W003	Oils	0.00	0.25	SR-S018	Savannah River CIF	Feb. 1996	Start of ops. + 24 months	Feb. 1998	\$16,862
KK-W004	Miscellaneous Laboratory Chemicals without Metals	0.00	0.25	IN-S005	INEL WERF Incinerator	Jan. 1996	Start of ops. + 18 months	Jul. 1997	\$24,918
KK-W005	Organic Debris	1.00	0.60	SR-S018	Savannah River CIF	Feb. 1996	Start of ops. + 24 months	Feb. 1998	\$23,088
KK-W006	Inorganic Debris and Equipment	0.70	1.00	RL-S007	Hanford WRAP IIA Facility	Sep. 1999	Start of ops. + 18 months	Mar. 2001	\$63,626
KK-W007	Inorganic Sludges/Particulates	0.10	0.93	RL-S007	Hanford WRAP IIA Facility	Sep. 1999	Start of ops. + 18 months	Mar. 2001	\$38,028
KK-W008	Organic Sludges/Particulates	0.00	0.75	SR-S018	Savannah River CIF	Feb. 1996	Start of ops. + 24 months	Feb. 1998	\$17,791
KK-W009	Organic Debris without Metals	0.00	0.40	SR-S018	Savannah River CIF	Feb. 1996	Start of ops. + 24 months	Feb. 1998	\$13,584
KK-W010	Elemental Lead (Lead Bricks, Sheets, or Wool)	0.00	1.00	RL-S007	Hanford WRAP IIA Facility	Sep. 1999	Start of ops. + 18 months	Mar. 2001	\$63,760
KK-W011	Cutting Oils and Liquids	0.00	0.40	SR-S018	Savannah River CIF	Feb. 1996	Start of ops. + 24 months	Feb. 1998	\$15,362
KK-W012	Miscellaneous Laboratory Chemicals	0.00	0.25	RL-S007	Hanford WRAP IIA Facility	Sep. 1999	Start of ops. + 18 months	Mar. 2001	\$28,643
KK-W013	Soils	0.00	7.50	IN-S015	INEL IWPF Incinerator	Not Available	Start of ops. + 18 months	Not Available	\$90,846
KK-W014	Mercury Contaminated Organics	0.00	0.20	IN-S128	INEL WEDF Mercury Retort Facility	Apr. 2000	Start of ops. + 18 months	Oct. 2001	\$23,130
KK-W015	Mercury Contaminated Inorganics	0.00	0.20	IN-S128	INEL WEDF Mercury Retort Facility	Apr. 2000	Start of ops. + 18 months	Oct. 2001	\$23,873
KK-W016	Elemental Mercury	0.00	0.001	IN-S010	INEL WROC Amalgamation Unit	Apr. 1999	Start of ops. + 18 months	Oct. 2000	\$21,645
KK-W017	PCB Contaminated Waste	0.00	2.00	IN-S015	INEL IWPF Incinerator	Not Available	Start of ops. + 18 months	Not Available	\$72,135

EXECUTIVE SUMMARY FOR THE KAPL - WINDSOR PROPOSED SITE TREATMENT PLAN

The Federal Facility Compliance Act of 1992 (FFCA) requires the U.S. Department of Energy (DOE) to prepare Site Treatment Plans (STPs) to address treatment of mixed radioactive and hazardous waste for each DOE site which generates and stores mixed waste. These plans are to be submitted to the states (or the U.S. Environmental Protection Agency (EPA) in cases where the state has not been delegated authority to regulate mixed waste) for approval. Owing to the joint Navy/DOE nature of the Naval Nuclear Propulsion Program (NNPP) and pursuant to the legislative history of the FFCA, NNPP facilities which generate and store mixed waste, including Knolls Atomic Power Laboratory-Windsor Site (KAPL-Windsor), are included in the FFCA process and have prepared STPs. The KAPL-Windsor Proposed Site Treatment Plan is being provided to EPA Region I for approval in accordance with the FFCA.

KAPL-Windsor generates very small amounts of mixed waste as a result of research and development for the design and operation of Naval nuclear propulsion plants. KAPL-Windsor currently has 0.0 cubic meters of mixed waste in storage, 0.30 cubic meters of mixed waste undergoing on-site processing and projects to generate approximately 60.60 cubic meters over the next five years (14.87 cubic meters of the 60.90 cubic meters is expected to be placed in storage pending availability of treatment following completion of on-site processing). These amounts represent less than 0.03 percent of the total amount of mixed waste stored and generated at DOE facilities.

As outlined in an April 6, 1993 Federal Register notice (58 FR 17875 as modified in 60 FR 10840, February 28, 1995), the STPs were developed in three stages. Conceptual Site Treatment Plans (CSTPs), which identified the range of potentially feasible treatment options for each mixed waste stream, were completed and submitted to state and EPA regulators in October 1993. Draft Site Treatment Plans (DSTPs), completed and submitted to state and EPA regulators in August 1994, discussed the evaluation of treatment options and identified the site's preferred treatment option for each waste stream. PSTPs, which contain DOE's preferred options developed after evaluation and integration with the site-specific options in other sites' DSTPs, are being submitted to state and EPA regulators in March 1995. This three step process was intended to facilitate early interaction with the regulators and other stakeholders to maximize the likelihood that the STPs will ultimately be approved by October 1995 as required by the FFCA.

Prior to submittal of the DSTPs in August 1994, KAPL-Windsor determined preferred treatment options for each waste stream by comparing all feasible treatment options (including on-site treatment, use of mobile treatment systems, commercial treatment, and treatment at other DOE facilities) in several fundamental areas (including regulatory compliance, treatment effectiveness, environment/health/safety concerns, cost, and implementability). This approach was used by all sites. Based on the very small volumes of KAPL-Windsor waste streams requiring treatment following completion of on-site processing, these evaluations indicated

that off-site treatment at other DOE facilities is economically and technically preferable to other options. KAPL-Windsor identified potentially technically capable DOE facilities for each waste stream based on an evaluation of available treatment facility information, then coordinated with the other DOE sites to confirm treatment capability and select preferred options. Several of the preferred treatment options now identified in the PSTP have been changed from those identified in the DSTP based on further evaluations to resolve technical uncertainties and based on the DOE Options Analysis Team (OAT) evaluations to improve the efficiency of the complex wide treatment configuration.

In addition to identifying the proposed treatment option for each KAPL-Windsor mixed waste stream, the PSTP also identifies proposed schedules for shipment of each waste stream to the selected treatment facility, and proposed arrangements for pre-treatment storage and post-treatment residual management for each waste stream. A single schedule milestone, for shipment to the treatment facility within 18 or 24 months of the start of facility operations, is proposed for each waste stream. Thus, pre-treatment storage on-site at KAPL-Windsor until the selected treatment facilities are available is proposed. Projected schedules for the start of operation of selected treatment facilities are identified, except where this information was not available for inclusion in the PSTP. The PSTP also proposes commitments to perform additional evaluations and work with EPA Region I to determine whether alternative treatment options should be selected in the event completion of a targeted treatment facility is delayed (or in the event the initial projected schedule is not acceptable for cases where a projected schedule is not currently available).

The following table contains a listing of the mixed waste streams and proposed treatment options identified in the KAPL-Windsor PSTP. The table also identifies the proposed schedule milestones, projected shipping dates, and estimated costs for implementing each proposed treatment option. If the targeted treatment facilities are completed according to currently identified schedules, the majority of KAPL-Windsor's mixed waste streams will be treated by 2001, and the total cost for treating all waste streams will be about \$400,000. KAPL-Windsor and the NNPP believe the KAPL-Windsor PSTP balances the concerns of expeditious completion of treatment, cost/efficiency, minimizing shipments, and minimizing risk/liability, and represents the best overall plan for achieving compliance with Land Disposal Restriction requirements for KAPL-Windsor mixed waste.

Waste Stream ID #	Waste Stream Name	Current Inventory (M3)	5 Year Projected Inventory (M3)	Preferred Option	Facility Name	Projected Start Date of Facility Operation	Proposed Milestone	Projected Shipping Date	Estimated Cost
KW-W001	Oils	0.00	0.45	SR-S018	Savannah River CIF	Feb. 1996	Start of ops. + 24 months	Feb. 1998	\$15,766
KW-W002	Miscellaneous Laboratory Chemicals	0.00	0.02	RL-S007	Hanford WRAP IIA Facility	Sep. 1999	Start of ops. + 18 months	Mar. 2001	\$21,334
KW-W003	Organic Debris	0.00	1.50	SR-S018	Savannah River CIF	Feb. 1996	Start of ops. + 24 months	Feb. 1998	\$24,562
KW-W004	Inorganic Debris and Equipment	0.00	2.38	RL-S007	Hanford WRAP IIA Facility	Sep. 1999	Start of ops. + 18 months	Mar. 2001	\$29,223
KW-W005	Inorganic Sludges/Particulates	0.00	0.20	RL-S007	Hanford WRAP IIA Facility	Sep. 1999	Start of ops. + 18 months	Mar. 2001	\$30,310
KW-W006	Organic Sludges/Particulates	0.00	1.60	SR-S018	Savannah River CIF	Feb. 1996	Start of ops. + 24 months	Feb. 1998	\$24,080
KW-W007	Elemental Lead (Lead bricks, sheets or wool)	0.00	1.67	RL-S007	Hanford WRAP IIA Facility	Sep. 1999	Start of ops. + 18 months	Mar. 2001	\$89,255
KW-W008	Miscellaneous Laboratory Chemicals Without Metals	0.00	0.30	IN-S005	INEL WERF Incinerator	Jan. 1996	Start of ops. + 18 months	Jul. 1997	\$26,570
KW-W009	Soils	0.00	4.20	IN-S015	INEL IWPF Incinerator	Not Available	Start of ops. + 18 months	Not Available	\$60,544
KW-W010	Mercury Contaminated Organics	0.00	0.05	IN-S128	INEL WEDF Mercury Retort Facility	Apr. 2000	Start of ops. + 18 months	Oct. 2001	\$22,016
KW-W011	Mercury Contaminated Inorganics	0.00	0.50	IN-S128	INEL WEDF Mercury Retort Facility	Apr. 2000	Start of ops. + 18 months	Oct. 2001	\$34,160
KW-W012	Elemental Mercury	0.00	0.001	IN-S010	INEL WROC Amalgamation Unit	Apr. 1999	Start of ops. + 18 months	Oct. 2000	\$22,445
KW-W014	PCB Contaminated Waste	0.00	2.00	IN-S015	INEL IWPF Incinerator	Not Available	Start of ops. + 18 months	Not Available	\$72,935

EXECUTIVE SUMMARY FOR THE KAPL-KNOLLS PROPOSED SITE TREATMENT PLAN

The Federal Facility Compliance Act of 1992 (FFCA) requires the U.S. Department of Energy (DOE) to prepare Site Treatment Plans (STPs) to address treatment of mixed radioactive and hazardous waste for each DOE site which generates and stores mixed waste. These plans are to be submitted to the states (or the U.S. Environmental Protection Agency (EPA) in cases where the state has not been delegated authority to regulate mixed waste) for approval. Owing to the joint Navy/DOE nature of the Naval Nuclear Propulsion Program (NNPP) and pursuant to the legislative history of the FFCA, NNPP facilities which generate and store mixed waste, including Knolls Atomic Power Laboratory (KAPL-Knolls), are included in the FFCA process and have prepared STPs. The KAPL-Knolls Proposed Site Treatment Plan (PSTP) is being provided to New York State Department of Environmental Conservation (NYSDEC) for approval in accordance with the FFCA.

KAPL-Knolls generates very small amounts of mixed waste as a result of research and development for the design and operation of Naval nuclear propulsion plants. KAPL-Knolls currently has approximately 1.57 cubic meters of mixed waste in storage and 7.58 cubic meters of mixed waste undergoing on-site processing, and projects to generate approximately 38.34 cubic meters over the next five years (28.81 cubic meters of the 38.34 cubic meters is expected to be placed in storage pending availability of treatment following completion of on-site processing.) These amounts represent less than 0.029 percent of the total amount of mixed waste stored and generated at DOE facilities.

As outlined in an April 6, 1993 Federal Register notice (58 FR 17875 as modified in 60 FR 10840, February 28, 1995), the STPs were developed in three stages. Conceptual Site Treatment Plans (CSTPs), which identified the range of potentially feasible treatment options for each mixed waste stream, were completed and submitted to state and EPA regulators in October 1993. Draft Site Treatment Plans (DSTPs), completed and submitted to state and EPA regulators in August 1994, discussed the evaluation of treatment options and identified the site's preferred treatment option for each waste stream. PSTPs, which contain DOE's preferred options developed after evaluation and integration with the site-specific options in other sites' DSTPs, are being submitted to state and EPA regulators in March 1995. This three step process was intended to facilitate early interaction with the regulators and other stakeholders to maximize the likelihood that the STPs will ultimately be approved by October 1995 as required by the FFCA.

Prior to submittal of the DSTPs in August 1994, KAPL-Knolls determined preferred treatment options for each waste stream by comparing all feasible treatment options (including on-site treatment, use of mobile treatment systems, commercial treatment, and treatment at other DOE facilities) in several fundamental areas (including regulatory compliance, treatment effectiveness, environment/health/safety concerns, cost, and implementability). This approach was used by all sites. Based on the very small volumes of KAPL-Knolls waste streams requiring treatment following completion of on-site processing, these evaluations indicated

that off-site treatment at other DOE facilities is economically and technically preferable to other options. KAPL-Knolls identified potentially technically capable DOE facilities for each waste stream based on an evaluation of available treatment facility information, then coordinated with the other DOE sites to confirm treatment capability and select preferred options. Several of the preferred treatment options now identified in the PSTP have been changed from those identified in the DSTP based on further evaluations to resolve technical uncertainties and based on the DOE Options Analysis Team (OAT) evaluations to improve the efficiency of the complex wide treatment configuration.

In addition to identifying the proposed treatment option for each KAPL-Knolls mixed waste stream, the PSTP also identifies proposed schedules for shipment of each waste stream to the selected treatment facility, and proposed arrangements for pre-treatment storage and post-treatment residual management for each waste stream. A single schedule milestone, for shipment to the treatment facility within 18 or 24 months of the start of facility operations, is proposed for each waste stream. Thus, pre-treatment storage on-site at KAPL-Knolls until the selected treatment facilities are available is proposed. Projected schedules for the start of operation of selected treatment facilities are identified, except where this information was not available for inclusion in the PSTP. The PSTP also proposes commitments to perform additional evaluations and work with NYSDEC to determine whether alternative treatment options should be selected in the event completion of a targeted treatment facility is delayed (or in the event the initial projected schedule is not acceptable for cases where a projected schedule is not currently available).

The following table contains a listing of the mixed waste streams and proposed treatment options identified in the KAPL-Knolls PSTP. The table also identifies the proposed schedule milestones, projected shipping dates, and estimated costs for implementing each proposed treatment option. If the targeted treatment facilities are completed according to currently identified schedules, the majority of KAPL-Knolls' mixed waste streams will be treated by 2001, and the total cost for treating all waste streams will be about \$770,000. KAPL-Knolls and the NNPP believe the KAPL-Knolls PSTP balances the concerns of expeditious completion of treatment, cost/efficiency, minimizing shipments, and minimizing risk/liability, and represents the best overall plan for achieving compliance with Land Disposal Restriction requirements for KAPL-Knolls mixed waste.

Waste Stream ID #	Waste Stream Name	Current Inventory (M3)	5 Year Projected Inventory (M3)	Preferred Option	Facility Name	Projected Start Date of Facility Operation	Proposed Milestone	Projected Shipping Date	Estimated Cost
KA-W001	Miscellaneous Laboratory Chemicals without Metals	0.00	2.00	IN-S015	INEL IWPF Incinerator	Not Available	Start of ops. + 18 months	Not Available	\$36,825
KA-W002	Cutting Oils and Liquids	0.00	0.10	SR-S018	Savannah River CIF	Feb. 1996	Start of ops. + 24 months	Feb. 1998	\$10,812
KA-W003	Trichloroethylene	0.20	0.10	SR-S018	Savannah River CIF	Feb. 1996	Start of ops. + 24 months	Feb. 1998	\$9,792
KA-W005	Asbestos Contaminated with Mercury	0.20	0.00	RL-S007	Hanford WRAP IIA Facility	Sep. 1999	Start of ops. + 18 months	Mar. 2001	\$24,477
KA-W006	Freon 113 on Rags	0.40	0.00	SR-S018	Savannah River CIF	Feb. 1996	Start of ops. + 24 months	Feb. 1998	\$9,983
KA-W007	Oils	0.23	2.00	SR-S018	Savannah River CIF	Feb. 1996	Start of ops. + 24 months	Feb. 1998	\$45,490
KA-W008	Miscellaneous Laboratory Chemicals	0.00	0.60	RL-S007	Hanford WRAP IIA Facility	Sep. 1999	Start of ops. + 18 months	Mar. 2001	\$30,051
KA-W009	Organic Debris	0.05	2.00	SR-S018	Savannah River CIF	Feb. 1996	Start of ops. + 24 months	Feb. 1998	\$11,795
KA-W010	Inorganic Debris and Equipment	0.021	0.90	RL-S007	Hanford WRAP IIA Facility	Sep. 1999	Start of ops. + 18 months	Mar. 2001	\$40,694
KA-W011	Elemental Lead (Lead in Bricks, Sheets or Wool)	0.35	1.20	RL-S007	Hanford WRAP IIA Facility	Sep. 1999	Start of ops. + 18 months	Mar. 2001	\$134,712
KA-W012	Inorganic Sludges and Particulates	0.00	0.60	RL-S007	Hanford WRAP IIA Facility	Sep. 1999	Start of ops. + 18 months	Mar. 2001	\$31,038
KA-W013	Organic Debris without Metals	0.00	0.40	SR-S018	Savannah River CIF	Feb. 1996	Start of ops. + 24 months	Feb. 1998	\$13,663
KA-W014	Organic Sludges and Particulates	0.00	0.40	SR-S018	Savannah River CIF	Feb. 1996	Start of ops. + 24 months	Feb. 1998	\$16,983
KA-W015	Soils	0.00	16.80	IN-S015	INEL IWPF Incinerator	Not Available	Start of ops. + 18 months	Not Available	\$218,817
KA-W016	Transuranic Debris	0.00	0.18	WP-S001	Waste Isolation Pilot Project	Dec. 1997	Jun. 1999	Jun. 1999	\$51,267
KA-W018	Mercury Contaminated Organics	0.00	1.00	IN-S128	INEL WEDF Mercury Retort Facility	Apr. 2000	Start of ops. + 18 months	Oct. 2001	\$46,560
KA-W019	Mercury Contaminated Inorganics	0.10	0.30	IN-S128	INEL WEDF Mercury Retort Facility	Apr. 2000	Start of ops. + 18 months	Oct. 2001	\$25,440
KA-W020	Elemental Mercury	0.02	0.08	IN-S010	INEL WROC Amalgamation Unit	Apr. 1999	Start of ops. + 18 months	Oct. 2000	\$39,960
KA-W021	PCB Contaminated Waste	0.00	0.15	IN-S015	INEL IWPF Incinerator	Not Available	Start of ops. + 18 months	Not Available	\$22,471

LAWRENCE LIVERMORE NATIONAL LABORATORY

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SITE TREATMENT PLAN FOR THE LAWRENCE BERKELEY NATIONAL LABORATORY BERKELEY, CALIFORNIA

EXECUTIVE SUMMARY

Purpose of the Site Treatment Plan

The Proposed Site Treatment Plan (PSTP) for the Lawrence Berkeley National Laboratory (LBNL) was written in response to the Federal Facility Compliance Act (FFCA). The FFCA requires that site treatment plans (STPs or plans) be developed for facilities at which the U.S. Department of Energy (DOE) generates or stores mixed waste. Mixed waste is defined by the FFCA as any waste containing both a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) and source, special nuclear, or by-product material subject to the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.).

On April 6, 1993, DOE published *The Schedule for Submitting Plans for the Treatment of Mixed Waste Generated or Stored at Each Site* in the *Federal Register* (58 FR 17875) describing its proposed process for developing the site treatment plans. The plans would be developed in three phases: conceptual, draft, and proposed. The conceptual plan presented known treatment needs, capabilities, and preliminary options for treating the mixed waste. The purpose of the draft plan was to identify site-specific preferred options for treating the mixed waste, or for developing technologies where technologies do not exist or need modification. The proposed plan reflects DOE's preferred options, developed with State input and based on existing available information. The options reflect a "bottom-up" approach and have been evaluated for their potential effects on other DOE sites and the overall DOE program. Changes in the preferred options and associated schedules were also made between the draft and proposed site treatment plans as a result of evaluations from the DOE-wide perspective. These may change further as a result of discussions with affected states and public comments before the approval of the PSTP and issuance by the California Department of Toxic Substances Control (DTSC) of an Order (FFCA Order) requiring DOE to implement the STP for each site.

The PSTP consists of the Compliance Plan Volume, and the Background Volume and its Appendices. The Compliance Plan Volume contains the enforceable milestones associated with the preferred treatment

options. A more detailed discussion of the preferred treatment options, which is provided for informational purposes only, is presented in the Background Volume and its Appendices.

DOE faces increasingly tight budgets throughout the DOE complex and anticipates that funding will continue to be constrained. The schedules in this and other Plans reflect those constraints. DOE has asked regulatory agencies to work with DOE and other interested parties at the site and National level to assist DOE in prioritizing its activities. Through this process, DOE expects that some schedules will be revised before the Site Treatment Plans are approved and FFCAct Orders issued.

Summary of PSTP Proposed Options for LBNL

Current inventories of mixed low-level wastes at LBNL are relatively small, with total known quantities not exceeding 6.25 m³. All mixed waste is proposed to either be characterized, undergo additional technology assessment, or to be shipped offsite for treatment at: the Idaho National Engineering Laboratory (INEL) in Idaho (5.83 m³) or the Oak Ridge National Laboratory in Tennessee (0.42 m³). Some wastes will be neutralized at LBNL before being shipped offsite to the INEL (1.74 m³). Schedules for these activities vary by waste stream. DOE will propose alternate treatment facilities, including commercial facilities, through the submittal of annual and semi-annual reports and future notices to DTSC.

Future generation of small quantities of mixed wastes at LBNL is expected due to continued laboratory operations. Future mixed wastes generated that do not meet RCRA Land Disposal Restriction requirements will be characterized and addressed in future reports.

EXECUTIVE SUMMARY

The Los Alamos National Laboratory (LANL) is a research and development facility owned by the Department of Energy (DOE) and operated for DOE by the University of California pursuant to a contract. The Federal Facility Compliance Act (FFCA) of October 6, 1992, required DOE to prepare a plan to treat mixed waste to the standards of the Land Disposal Restrictions (LDR) for each DOE facility that generates or stores mixed waste. This Proposed Site Treatment Plan (PSTP) was presented to the regulator, the New Mexico Environment Department (NMED), on March 30, 1995, who issued it for public comment. NMED revised it and issued the final Site Treatment Plan (STP) as part of a Federal Facility Compliance Order (Order), requiring compliance with the approved plan, on October 4, 1995.

On March 15, 1994, DOE signed a Federal Facility Compliance Agreement (FFCAgreement) with the Environmental Protection Agency (EPA), Region 6, to treat mixed waste and achieve compliance with LDRs. The State of New Mexico was not a signatory to that agreement. The FFCA Order and STP replace the FFCAgreement which, by its terms, terminated upon issuance of NMED's Order.

This STP is an attachment to the Order and comprises two volumes: the Background Volume (BV) which contains detailed discussions of the waste streams and preferred options and is provided for informational purposes only; and the Compliance Plan Volume (CPV) which contains overall schedules for activities, and dates by which LANL's existing mixed wastes must achieve compliance with LDRs.

LANL generates two types of mixed waste, Low-Level Mixed Waste (LLMW) and Mixed Transuranic Waste (MTRU). These two wastes are distinguished by the level of radioactive contamination. The quantity and diversity of these wastes represent the diversity of activities expected at a national research facility.

LANL has approximately 600 cubic meters (m^3) (equal to some 3000 drum equivalents) of LLMW in storage. The waste is made up of approximately 5000 separate items, individual containers of waste that have been combined into 31 treatability groups, each with preferred treatment options identified as shown in Table ES-1. LANL just completed recharacterizing the LLMW as required by the FFCAgreement. LANL's recent recharacterization work resulted in a significant decrease in the volumes reported in previous documentation. Additional characterization activities, such as a Sorting, Surveying, and Decontamination project, are required by the STP and are ongoing.

The plan for treating LLMW relies on off-site commercial treatment, and on-site treatment using mobile skid-mount treatment units shared with other DOE sites.

The DOE Albuquerque Operations Office (AL) prepared the AL Mixed Waste Treatment Plan (ALMWTP) that uses the resources of the sites reporting to AL to treat the LLMW at those sites. Under the plan, each site is responsible for providing different mobile treatment technologies for waste streams where no off-site capability exists; these are designed to be moved to different sites providing on-site treatment capacity. The Grand Junction Project Office (GJPO) manages the overall program and maintains a schedule of mobile treatment availability to the sites. Schedules given in the CPV for treating LANL's LLMW using mobile treatment units are based on the GJPO schedule.

Over 1200 items (14m³) in LANL's inventory currently managed as LLMW are suspected of having radioactive contamination. A field Sorting, Surveying, and Decontamination operation will determine whether these wastes are contaminated with radioactivity. If not, they will be treated as nonradioactive hazardous wastes at commercial off-site facilities. If they are contaminated, the wastes fall into the defined treatability groups and will be treated using the preferred treatment option identified for that treatability group.

LANL has identified approximately 3800m³ (equivalent to 20,000 drums) of MTRU in storage. MTRU has been stored since 1971, before hazardous waste regulations were in place. The hazardous components of the TRU are, therefore, not well defined. Activities to improve characterization of MTRU waste were included in the revised waste analysis plan submitted to NMED in March 1995. Activities to improve storage of these waste were the subject of a separate compliance order. While the DOE national policy on MTRU presumes its shipment to the Waste Isolation Pilot Plant (WIPP) beginning in 1998, the Order presently requires development of MTRU treatment technologies and on-site treatment of LANL's MTRU.

EXECUTIVE SUMMARY FOR THE MINS PROPOSED SITE TREATMENT PLAN

The Federal Facility Compliance Act of 1992 (FFCA) requires the U.S. Department of Energy (DOE) to prepare Site Treatment Plans (STPs) to address treatment of mixed radioactive and hazardous waste for each DOE site which generates and stores mixed waste. These plans are to be submitted to the states (or the U.S. Environmental Protection Agency (EPA) in cases where the state has not been delegated authority to regulate mixed waste) for approval. Owing to the joint Navy/DOE nature of the Naval Nuclear Propulsion Program (NNPP) and pursuant to the legislative history of the FFCA, NNPP facilities which generate and store mixed waste, including Mare Island Naval Shipyard (MINS), are included in the FFCA process and have prepared STPs. The MINS Proposed Site Treatment Plan (PSTP) is being provided to the California Department of Toxic Substances Control for approval in accordance with the FFCA.

MINS generates very small amounts of mixed waste as a result of maintenance and repair work performed on Naval nuclear propulsion plants. MINS currently has approximately 25.45 cubic meters of mixed waste in storage, 1.32 cubic meters of mixed waste undergoing on-site processing, and projects to generate approximately 44.88 cubic meters prior to scheduled shipyard closure in April 1996 (14.73 cubic meters of the 44.88 cubic meters is expected to be placed in storage pending availability of treatment following completion of on-site processing). These amounts represent less than 0.034 percent of the total amount of mixed waste stored and generated at DOE facilities.

As outlined in an April 6, 1993 Federal Register notice (58 FR 17875 as modified in 60 FR 10840, February 28, 1995), the STPs were developed in three stages. Conceptual Site Treatment Plans (CSTPs), which identified the range of potentially feasible treatment options for each mixed waste stream, were completed and submitted to state and EPA regulators in October 1993. Draft Site Treatment Plans (DSTPs), completed and submitted to state and EPA regulators in August 1994, discussed the evaluation of treatment options and identified the site's preferred treatment option for each waste stream. PSTPs, which contain DOE's preferred options developed after evaluation and integration with the site-specific options in other sites' DSTPs, are being submitted to state and EPA regulators in March 1995. This three step process was intended to facilitate early interaction with the regulators and other stakeholders to maximize the likelihood that the STPs will ultimately be approved by October 1995 as required by the FFCA.

Prior to submittal of the DSTPs in August 1994, MINS determined preferred treatment options for each waste stream by comparing all feasible treatment options (including on-site treatment, use of mobile treatment systems, commercial treatment, and treatment at other DOE facilities) in several fundamental areas (including regulatory compliance, treatment effectiveness, environment/health/safety concerns, cost, and implementability). This approach was used by all sites. Based on the very small volumes of MINS's waste streams requiring treatment following completion of on-site processing, these evaluations indicated that off-site treatment at other DOE facilities is economically and technically preferable to other options. MINS identified potentially technically capable DOE facilities for each waste stream based on

an evaluation of available treatment facility information, then coordinated with the other DOE sites to confirm treatment capability and select preferred options. Several of the preferred treatment options now identified in the PSTP have been changed from those identified in the DSTP based on further evaluations to resolve technical uncertainties and based on the DOE Options Analysis Team (OAT) evaluations to improve the efficiency of the complex wide treatment configuration.

In addition to identifying the proposed treatment option for each MINS mixed waste stream, the PSTP also identifies proposed schedules for shipment of each waste stream to the selected treatment facility, and proposed arrangements for pre-treatment storage and post-treatment residual management for each waste stream. To support base closure schedules, a single schedule milestone, for shipment to the treatment facility by January 1996, is proposed for each MINS waste stream. Thus, pre-treatment storage at the selected treatment facility is proposed. MINS and the NNPP consider support of base closure is sufficient justification for having very small volumes of MINS waste stored at treatment sites prior to the availability of the selected treatment facilities. Projected schedules for the start of operation of selected treatment facilities are identified, except where this information was not available for inclusion in the PSTP.

The MINS PSTP proposes that treatment residuals from MINS mixed waste streams be stored at the treatment sites until DOE complex-wide mixed waste disposal arrangements are established. This proposal is based on supporting MINS's base closure schedule, the very small volumes of MINS's mixed waste streams, the desire to minimize shipments, and technical concerns associated with different radionuclides and hazardous constituents in the residues. Given the very small volumes of MINS's mixed waste streams, these streams will likely be blended with other waste streams at the treatment sites to facilitate treatment. Therefore, treatment residuals will likely be a mixture of MINS's and other sites' residuals which may contain different radionuclides and hazardous constituents from the original MINS waste streams. MINS and the NNPP consider this technical justification supports having very small volumes of treatment residuals remain at the treatment sites vice being returned to MINS.

The following table contains a listing of the mixed waste streams and proposed treatment options identified in the MINS PSTP. The table also identifies the proposed schedule milestones, projected shipping dates, and estimated costs for implementing each proposed treatment option. If the PSTP proposals are approved, all of MINS's mixed waste streams will be shipped to the treatment site by January 1996 to support the base closure schedule, and the total cost for treating all waste streams will be about \$ 428,000. MINS and the NNPP believe the MINS PSTP balances the concerns of expeditious completion of treatment, cost/efficiency, minimizing shipments, and minimizing risk/liability, and represents the best overall plan for achieving compliance with Land Disposal Restriction requirements for MINS mixed waste.

Waste Stream ID #	Waste Stream Name	Current Inventory (M3)	5 Year Projected Inventory (M3)	Preferred Option	Facility Name	Projected Start Date of Facility Operation	Proposed Milestone	Projected Shipping Date	Estimated Cost
MI-W001	Solid Waste with Heavy Metals	5.31	1.81	IN-S005	INEL WERF Incinerator	Jan. 1996	Jan. 1996	Jan. 1996	\$38,471
MI-W002	Solidified Solution with Heavy Metals	0.85	0.00	IN-S004	INEL WERF Stabilization Unit	Jan. 1996	Jan. 1996	Jan. 1996	\$27,207
MI-W003	Paint Chips Containing Heavy Metals	0.47	1.32	IN-S005	INEL WERF Incinerator	Jan. 1996	Jan. 1996	Jan. 1996	\$9,529
MI-W004	Equipment Containing Thallium	0.40	0.00	IN-S034	INEL NWCF Debris Treatment Facility	Oct. 2000	Jan. 1996	Jan. 1996	\$10,458
MI-W005	Solid Waste with Petroleum Products	10.20	2.08	IN-S005	INEL WERF Incinerator	Jan. 1996	Jan. 1996	Jan. 1996	\$137,061
MI-W006	Materials Containing Asbestos	1.74	4.44	NONE	None	Not Applicable	Not Applicable	Not Applicable	TBD
MI-W007	Lead Bricks, Sheets, Wool, Scrapings	2.76	0.58	IN-S034	INEL NWCF Debris Treatment Facility	Oct. 2000	Jan. 1996	Jan. 1996	\$62,674
MI-W008	Brass and Bronze	2.83	2.33	IN-S003	INEL WROC Macroencapsulation Unit	Apr. 1998	Jan. 1996	Jan. 1996	\$77,327
MI-W009	Solid Waste with Corrosives	0.14	0.00	IN-S005	INEL WERF Incinerator	Jan. 1996	Jan. 1996	Jan. 1996	\$9,010
MI-W010	Batteries and Film Packs with Mercury	0.19	0.045	IN-S004	INEL WERF Stabilization Unit	Jan. 1996	Jan. 1996	Jan. 1996	\$9,264
MI-W011	Materials Containing PCBs	0.11	0.62	IN-S015	INEL IWPF Incinerator	Not Available	Jan. 1996	Jan. 1996	\$10,502
MI-W012	Combustible Debris	0.21	0.42	IN-S005	INEL WERF Incinerator	Jan. 1996	Jan. 1996	Jan. 1996	\$10,207
MI-W013	Organic Process Residues	0.00	1.06	IN-S015	INEL IWPF Incinerator	Not Available	Jan. 1996	Jan. 1996	\$17,173
MI-W014	Inorganic Debris with Heavy Metals without Mercury	0.24	0.02	IN-S003	INEL WROC Macroencapsulation Unit	Apr. 1998	Jan. 1996	Jan. 1996	\$9,505

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SITE TREATMENT PLAN FOR DOE MIXED WASTES AT THE MISSOURI UNIVERSITY RESEARCH REACTOR COLUMBIA, MISSOURI

EXECUTIVE SUMMARY

Purpose of the Site Treatment Plan

The Proposed Site Treatment Plan (PSTP) for U.S. Department of Energy (DOE) mixed wastes at the Missouri University Research Reactor (MURR) was written in response to the Federal Facility Compliance Act (FFCA). The FFCA requires that site treatment plans (STP's or plans) be developed for facilities at which the DOE generates or stores mixed waste. Mixed waste is defined by the FFCA as any waste containing both a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA), and source, special nuclear, or by-product material subject to the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.).

On April 6, 1993, DOE published *The Schedule for Submitting Plans for the Treatment of Mixed Waste Generated or Stored at Each Site* in the *Federal Register* (58 FR 17875, DOE, 1993a) describing its proposed process for developing the site treatment plans. The plans would be developed in three phases: conceptual, draft, and proposed. The conceptual plan presented known treatment needs, capabilities, and preliminary options for treating the mixed waste. The purpose of the draft plan was to identify site-specific preferred options for treating the mixed waste, or for developing technologies where technologies do not exist or need modification. The proposed plan reflects DOE's preferred options, developed with state input and based on existing available information. The options reflect a "bottom-up" approach and have been evaluated for their potential effects on other DOE sites and the overall DOE program. Changes in the preferred options and associated schedules were also made between the draft and proposed site treatment plans as a result of evaluations from the DOE-wide perspective. These may change further as a result of discussions with affected states and public comments before the approval of the PSTP and issuance by the Missouri Department of Natural Resources (MDNR) of an Order (FFCA Order) requiring DOE to implement the STP for each site.

The PSTP consists of the Compliance Plan Volume, and the Background Volume and its Appendices. The Compliance Plan Volume contains the enforceable milestones associated with the preferred treatment options. A more detailed discussion of the preferred treatment options, which is provided for informational purposes only, is presented in the Background Volume and its Appendices.

DOE faces increasingly tight budgets throughout the DOE complex and anticipates that funding will continue to be constrained. The schedules in this and other Plans reflect those constraints. DOE has asked regulatory agencies to work with DOE and other interested parties at the site and National level to assist DOE in prioritizing its activities. Through this process, DOE expects that some schedules will be revised before the Site Treatment Plans are approved and FFCAct Orders issued.

Summary of PSTP Proposed Options

Current inventories of DOE/OAK mixed wastes at MURR are relatively small, consisting of about 1.0 m³ of mixed low-level waste (MLLW, 5 drums), comprised of debris and contaminated equipment, and 0.1 m³ of mixed transuranic (MTRU) waste (0.5 drum), consisting of solid residues from analytical samples, spent reagents, and experimental apparatus components. Future generation of these two types of waste (until project completion in 1998) is expected to bring the total quantity of waste produced to 5.0 m³ (24 drums) of MLLW and 1.0 m³ of MTRU waste. If generation of these mixed wastes do not meet RCRA Land Disposal Restriction requirements, they will be characterized and addressed in updates to this plan as required.

The MLLW is expected to be shipped to the Idaho National Engineering Laboratory (INEL) Waste Experimental Reduction Facility (WERF). The MTRU waste streams are expected to be shipped to the Waste Isolation Pilot Plant (WIPP); although the schedule dates for shipment are dependent upon development of final WIPP Waste Acceptance Criteria (WAC) and approval of the WIPP No-Migration Variance Petition by the EPA and the State of New Mexico.

EXECUTIVE SUMMARY

for the

MOUND FACILITY, MIAMISBURG, OHIO

SITE TREATMENT PLAN

Site Treatment Plans (STPs) are required for facilities at which DOE generates or stores mixed waste; mixed waste contains both a hazardous waste subject to the Resource Conservation and Recovery Act, and a source, special nuclear or by-product material subject to the Atomic Energy Act of 1954. On April 6, 1993, DOE published a Federal Register notice (58 FR 17875) describing its proposed process for developing the STP in three phases, including a Conceptual STP, a Draft STP, and a Final STP. The purpose of these Plans is to identify the preferred options for treating the mixed waste at Mound Facility or for developing treatment technologies where technologies do not exist or need modification. The PSTP is DOE's proposal to manage these wastes. The preferred options have been reviewed for DOE-wide impacts and were evaluated by the Options Analysis Team (OAT) to formulate the "wise" configuration for treatment for the overall DOE program. The preferred options could change between the Proposed STP and approval of the final STP by the Ohio EPA, based on continuing discussions with regulators and continuing analysis of DOE-wide impacts.

Since 1947, Mound Facility's mission has been the development of processes for the nuclear weapons program, production of non-nuclear components for nuclear weapons, and diagnostic testing of explosive and nuclear components. With the DOE consolidation of non-nuclear manufacturing, the current mission assignment for Mound is changing to include clean-up of contaminated buildings and land, along with commercial economic development of the site.

The treatment ranking hierarchy preferred by the Ohio EPA is (1) modify or build on-site treatment, (2) on-site portable/mobile units, (3) Ohio option (off-site, in state), and last (4) off-site out-of-state. Treatment technology evaluation consisted of listing feasible alternatives, screening the selected technologies, and performing an evaluation of the remaining technologies. The evaluation is based on the Treatment Selection Guides developed by the DOE FFCAct Task Force. The scores were based on the available information at this time. This procedure could produce different preferred options if redone in the future, particularly as new technologies mature. As technologies are developed and system efficiencies are sought to reduce costs and expedite treatment, a new preferred option may surface. When changes are determined to be appropriate, DOE will consult with the state to request approval.

The waste streams with DOE preferred options along with volume in storage and estimated treatment residual volume are summarized in the table below. Two waste stream volumes, W007 lead-acid batteries and W002 TRU corrosives, have been adjusted to zero. TRU corrosives were found to not meet the definition of corrosives. The lead-acid batteries were disassembled. The lead in the batteries was found to be not contaminated and awaits recycle.

Summary of Mound Facility Mixed Waste Streams and Preferred Treatment Options

MWIR#	WASTE STREAM	VOL.(m ³)	PREFERRED OPTION	EST. RESIDUAL VOL. (m ³)
W001	Scintillation Cocktail	43.3	Commercial Treatment	6.8
W013	Waste Oils	26.8	Commercial Treatment	0.196
		0.6	TSCA Incinerator	0.004
W008	Kerosene, PCB's	1.1	TSCA Incinerator	0.1
W012	Lead Loaded Gloves	0.0204	Encapsulation	0.11
W007	Lead-Acid Batteries	0.0	Survey/Decon	0.0
W004	Lead Shapes	5.0	Surface Decon	2.0
W009	Absorbed Oil PCB's	0.227	Thermal Desorb/TSCA	1.2
W005	Liquid Mercury	0.018	Amalgamation	0.025
W010/11	Lab Packs	0.16	Sort/Survey/Analyze	0.3
W014	Newly Discovered Waste	19.9	Sort/Survey/Analyze	2.5
W002	TRU Corrosives	0.0	WIPP	0.0
W003	TRU Lead Gloves	1.6	WIPP	1.6
TOTAL		98.73 m ³		14.84 m ³

1 EXECUTIVE SUMMARY
2

3 Site Treatment Plans (STPs) are required for facilities at which the U.S. Department of Energy (DOE)
4 generates or stores mixed waste, which is defined by the Federal Facility Compliance Act (FFCAct) as
5 waste containing both a hazardous waste subject to the Resource Conservation and Recovery Act and
6 a radioactive material, subject to the Atomic Energy Act. On April 6, 1993, DOE published a *Federal*
7 *Register* notice (58 FR 17875) describing its proposed process for developing the STPs in three
8 phases including a Conceptual, a Draft, and a Final Site Treatment Plan. The Final Site Treatment
9 Plan has been renamed to the Proposed Site Treatment Plan (PSTP) for the purposes of scoping and
10 clarity. Similar to the Draft Site Treatment Plan (DSTP), the PSTP reflects more refined DOE
11 preferred options and schedules that are based on the most accurate existing information. All of the
12 DOE Nevada Operations Office STP iterations have been developed with the state of Nevada's input.
13 The options and schedules reflect a "bottoms-up" approach and have been evaluated for impacts on
14 other DOE sites, as well as impacts to the overall DOE program. Changes may have occurred in the
15 preferred option and associated schedules between the DSTP, submitted to the state of Nevada and
16 U.S. Environmental Protection Agency August 1994, and the PSTP as evaluation progresses from the
17 DOE-wide perspective. Changes may have also occurred as a result of state-to-state discussion prior
18 to the submission and approval of the PSTP and issuance of the Consent Order (CO).

19
20 To the extent practicable, the PSTP identifies specific treatment facilities for treating the mixed waste
21 and proposes schedules as set forth in the FFCAct. When treatment options are not possible due to
22 the lack of characterization data, plans and schedules for characterizing wastes, undertaking
23 technology assessments, and providing the required plans and schedules for developing capacity are
24 provided as appropriate. All schedule information presented is subject to change depending on CO
25 negotiations between the DOE and the state of Nevada. For new facilities, the schedule is dependent
26 upon decisions made during the design phase and is contingent on funding availability. Assumptions
27 and professional judgments related to the type of treatment technology, location of the treatment
28 facility, contracting mechanism, project approval process, and cost were used to develop the
29 schedules. Any variation of the assumptions will impact the schedules. Cost data used in developing
30 options and schedules are planning estimates only.

31
32 The schedules in this PSTP have not yet been integrated with those of other DOE sites from a
33 technical, complex-wide perspective. Moreover, DOE faces increasingly tight budgets throughout the
34 DOE complex and anticipates that funding will continue to be constrained. The schedules in this and
35 other STPs reflect those constraints. DOE has asked regulatory agencies to work with DOE and other
36 interested parties at the site and national level to assist DOE in prioritizing its activities. Through this
37 process, DOE expects that some schedules will be revised before the STPs are approved and COs
38 issued.

1 Emerging or new technologies not yet considered that provide opportunities to manage waste more
2 safely and effectively and at a lower cost than current technologies identified in the PSTP may be
3 developed in the future. Working closely with regulators and others during the implementation of
4 the STP process, DOE shall continue to evaluate and develop technologies that offer potential
5 advantages in the areas of public acceptance, risk abatement, performance, and life cycle cost.
6 Impacts caused by changes to compliance documents and/or improved technologies shall be
7 evaluated for possible modification to this PSTP. Changes, revisions, and modifications to this PSTP
8 shall be in accordance with the provisions outlined in the CO.

9
10 The Background Volume (BV), in conjunction with the Plan Volume (PV), comprises the PSTP. The
11 PV provides overall schedules with milestones and target dates for achieving compliance with Land
12 Disposal Restrictions, and a general framework for the establishment and review of milestones and
13 target dates. Additional discussion contained in the BV is provided for informational purposes only.

EXECUTIVE SUMMARY FOR THE NNS PROPOSED SITE TREATMENT PLAN

The Federal Facility Compliance Act of 1992 (FFCA) requires the U.S. Department of Energy (DOE) to prepare Site Treatment Plans (STPs) to address treatment of mixed radioactive and hazardous waste for each DOE site which generates and stores mixed waste. These plans are to be submitted to the States (or the U.S. Environmental Protection Agency (EPA) in cases where the state has not been delegated authority to regulate mixed waste) for approval. Owing to the joint Navy/DOE nature of the Naval Nuclear Propulsion Program (NNPP) and pursuant to the legislative history of the FFCA, NNPP facilities which generate and store mixed waste, including Norfolk Naval Shipyard (NNS), are included in the FFCA process and have prepared STPs. The NNS Proposed Site Treatment Plan (PSTP) is being provided to EPA Region III for approval in accordance with the FFCA.

NNS generates very small amounts of mixed waste as a result of maintenance and repair work performed on Naval nuclear propulsion plants. NNS currently has 0.0 cubic meters of mixed waste in storage, 5.07 cubic meters of mixed waste undergoing processing and projects to generate approximately 62.75 cubic meters over the next five years (11.8 cubic meters of the 62.75 cubic meters is expected to be placed in storage pending availability of treatment following completion of on-site processing). These amounts represent less than .03 percent of the total amounts of mixed waste stored and generated at DOE facilities.

As outlined in an April 6, 1993 Federal Register notice (58 FR 17875 as modified in 60 FR 10840, February 28, 1995), the STPs were developed in three stages. Conceptual Site Treatment Plans (CSTPs), which identified the range of potentially feasible treatment options for each mixed waste stream, were completed and submitted to state and EPA regulators in October 1993. Draft Site Treatment Plans (DSTPs), completed and submitted to state and EPA regulators in August 1994, discussed the evaluation of treatment options and identified the site's preferred treatment option for each waste stream. PSTPs, which contain DOE's preferred options developed after evaluation and integration with the site-specific options in other site's DSTPs, are being submitted to state and EPA regulators in March 1995. This three step process was intended to facilitate early interaction with the regulators and other stakeholders to maximize the likelihood that the plans will ultimately be approved by October 1995 as required by the FFCA.

Prior to submittal of the DSTPs in August 1994, NNS determined preferred treatment options for each waste stream by comparing all feasible treatment options (including on-site treatment, use of mobile treatment systems, commercial treatment, and treatment at other DOE facilities) in several fundamental areas (including regulatory compliance, treatment effectiveness, environment/health/safety concerns, cost, and implementability). This approach was used by all sites. Based on the very small volumes of NNS's waste streams requiring treatment following completion of on-site processing, these evaluations indicated that off-site treatment at other DOE facilities is economically and technically preferable to other options. NNS identified potentially technically capable DOE facilities for each waste stream based on an

evaluation of available treatment facility information, then coordinated with the other DOE sites to confirm treatment capability and select preferred options. Several of the preferred treatment options now identified in the PSTP have been changed from those identified in the DSTP based on further evaluations to resolve technical uncertainties and based on the DOE Options Analysis Team (OAT) evaluations to improve the efficiency of the complex wide treatment configuration.

In addition to identifying the proposed treatment option for each NNS mixed waste stream, the PSTP also identifies proposed schedules for shipment of each waste stream to the selected treatment facility, and proposed arrangements for pre-treatment storage and post-treatment residual management for each waste stream. A single schedule milestone, for shipment to the treatment facility within 18 or 24 months of the start of facility operations, is proposed for each waste stream. Thus, pre-treatment storage on-site at NNS until the selected treatment facilities are available is proposed. Projected schedules for the start of operation of selected treatment facilities are identified, except where this information was not available for inclusion in the PSTP. The PSTP also proposes commitments to perform additional evaluations and work with EPA Region III to determine whether alternative treatment options should be selected in the event completion of a targeted treatment facility is delayed (or in the event the initial projected schedule is not acceptable for cases where a projected schedule is not currently available).

The following table contains a listing of the mixed waste streams and proposed treatment options identified in the NNS PSTP. The table also identifies the proposed schedule milestones, projected shipping dates, and estimated costs for implementing each proposed treatment option. If the targeted treatment facilities are completed according to currently identified schedules, the majority of NNS's mixed waste streams will be treated by 1998, and the total cost for treating all waste streams will be approximately \$271,000. NNS and the NNPP believe the NNS PSTP balances the concerns of expeditious completion of treatment, cost/efficiency, minimizing shipments, and minimizing risk/liability, and represents the best overall plan for achieving compliance with Land Disposal Restriction requirements for NNS mixed waste.

Waste Stream ID #	Waste Stream Name	Current Inventory (M3)	5 Year Projected Inventory (M3)	Preferred Option	Facility Name	Projected Start Date of Facility Operation	Proposed Milestone	Projected Shipping Date	Estimated Cost
NN-W001	Lead/Chromium Based Paint Chips	0.00	2.15	IN-S005	INEL WERF Incinerator	Jan. 1996	Start of ops. + 18 months	Jul. 1997	\$64,786
NN-W002	Solid Waste Contaminated with Potassium Chromate Solution	0.00	2.05	SR-S018	Savannah River CIF	Feb. 1996	Start of ops. + 24 months	Feb. 1998	\$18,890
NN-W003	Debris with Heavy Metals	0.00	7.60	IN-S003	INEL WROC Macroencapsulation Unit	Apr. 1998	Start of ops. + 18 months	Oct. 1999	\$187,593

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Executive Summary

Oak Ridge Reservation

Modified Site Treatment Plan

U.S. Department of Energy

October 2, 1995

Site treatment plans are required for facilities at which the U.S. Department of Energy (DOE) generates or stores mixed waste, defined by the Federal Facility Compliance Act (FFCA) as waste containing both a hazardous waste subject to the Resource Conservation and Recovery Act (RCRA) and a source, special nuclear, or by-product material subject to the Atomic Energy Act of 1954 (42 USC 2011, et seq.). On October 1, 1995, a Tennessee Department of Environment and Conservation Commissioner's Order became effective requiring DOE Oak Ridge Operations to comply with a modified site treatment plan for treatment of Oak Ridge Reservation mixed waste. The modified site treatment plan identifies specific facilities or approaches and schedules for treatment of mixed wastes on the Oak Ridge Reservation. Activities include continued waste characterization; use of existing waste treatment facilities; development and/or modification of treatment technologies to provide needed capacity; and use of private sector treatment.

The amount of mixed waste currently on the Oak Ridge Reservation addressed by the modified site treatment plan is 33.4 million kg. The plan proposes to defer treatment decisions for approximately 7.3 million kg (5 streams) of mixed waste that is subject to the provisions of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) to the Record of Decision (ROD) that will be developed for each stream. Treatment methods, facilities, and schedules (or activities leading to treatment) for the 31.5 million kg of mixed low-level waste and 1.9 million kg of mixed transuranic waste are presented in the modified site treatment plan. The untreated inventory addressed by the modified site treatment plan includes some 143 waste streams (137 low-level and 6 transuranic), with an annual generation rate of less than 1 million kg (virtually all low-level).

The treatment strategies reflected in the modified treatment plan are as follows.

1. Existing and modified on-site facilities (wastewater treatment plants and the TSCA Incinerator) will be used to treat mixed waste when possible. Some 2.1 million kg of mixed waste are targeted for treatment using existing capacity. Although mixed waste treatment capability on the reservation is limited, significant progress has been made in treating aqueous and organic liquid mixed waste since the promulgation of the FFCA using these systems. Over 2.5 million kg of mixed waste was treated on the Oak Ridge Reservation in FY 1994 alone.
2. Commercial treatment will be pursued for several waste types, including large-volume sludges and soils. The plan identifies 21.8 million kg of mixed low-level waste to be treated through private sector capabilities. Proof-of-process treatment contracts have been awarded for waste streams that comprise approximately half of the untreated inventory addressed by the plan.
3. Some 1.9 million kg of contact and remotely handled mixed transuranic wastes will be treated only as necessary to meet the waste acceptance criteria of the Waste Isolation Pilot Plant. The plan proposes construction of a new Transuranic Processing Facility (TPF) to provide the needed treatment capability. In addition, 1.3 million kg of remote-handled liquid low level waste will also be treated at the TPF.
4. Approximately 6.3 million kg of mixed low-level waste requires further characterization and/or technology assessment to support disposal or treatment through the private sector.

Resources for implementing the schedules presented in the modified site treatment plan are included in the existing FY 1996 budget. Funding to implement the modified site treatment plan beyond FY 1997 will be requested by DOE-OR. In response to the budget reductions faced by DOE, activities to identify alternate treatment strategies that can be implemented on a much shorter schedule and lower cost than those currently projected in the modified site treatment plan are continuing. Particular emphasis is being placed on evaluating use of existing facilities for treating and repackaging mixed transuranic wastes. Modification of existing facilities may offer significant cost and schedule advantages over constructing new facilities. Also, new or

developing waste management technologies may be discovered that are safer, more effective, and more cost-efficient than the current technologies considered in this modified site treatment plan. Working closely with regulators and others during the implementation of modified site treatment plan, DOE will continue to evaluate near-term deployment alternatives and technologies that offer potential advantages in the areas of public acceptance, risk abatement, performance, and life-cycle cost. Should better technologies or implementation alternatives be discovered, DOE may request additional modification of the modified site treatment plan in accordance with provisions of the Commissioner's Order.

Definitions

Mixed Waste: Mixed waste is waste that contains both hazardous waste and radioactive material (source, special nuclear, or by-product material as regulated by the Atomic Energy Act of 1954 [42 U.S.C. 2011 et seq.]). Mixed waste is classified by DOE according to the type of radioactive waste that it contains as either mixed low-level waste (MLLW), or mixed transuranic waste (MTRU). DOE's high-level waste (HLW) is assumed to be mixed waste because it contains hazardous components or exhibits the characteristic of corrosivity.

Low-level Waste: Low-level waste (LLW) is radioactive material that is not classified as high-level waste, TRU waste, spent fuel, or uranium or thorium mill tailings.

Transuranic Waste: Transuranic waste (TRU) refers to radioactive materials contaminated with greater than 100 nanocuries per gram of alpha-emitting radionuclides with half-lives greater than 20 years.

Site Treatment Plan
for the
Paducah Gaseous Diffusion Plant

The Paducah Gaseous Diffusion Plant (PGDP) is owned by the United States Department of Energy (DOE) and is located in western Kentucky in rural McCracken County. The principal site process is the separation of uranium isotopes through gaseous diffusion. In October 1992, congressional passage of the Energy Policy Act of 1992 established the United States Enrichment Corporation (USEC). The DOE-PGDP and the USEC each have separate and defined roles and responsibilities. In accordance with the Energy Policy Act, the USEC leases and operates the uranium enrichment facility at the PGDP. The primary mission of the DOE-PGDP is environmental restoration and waste management.

The DOE is required by Section 3021(b) of the Resource Conservation and Recovery Act (RCRA), and amended by the Federal Facility Compliance Act (FFCA), to prepare Site Treatment Plans (STPs) describing the development of treatment capacities and technologies for treating mixed waste, defined by the FFCA as waste containing both a hazardous waste subject to RCRA, and a source special nuclear or by-product material subject to the Atomic Energy Act of 1954 (42 U.S.C 2011 *et seq.*) On April 6, 1993, the DOE published a notice 58 *Federal Register* 17875, describing the proposed process for developing the STPs in three phases, including a Conceptual Site Treatment Plan (CSTP), a Draft Site Treatment Plan (DSTP), and a Proposed Site Treatment Plan (PSTP). The DOE-PGDP is also submitting this document to the United States Environmental Protection Agency (EPA) Region IV to satisfy the Land Disposal Restrictions (LDR) Federal Facility Compliance Agreement (FFCA) by developing a final plan setting forth treatment technologies for wastes without existing treatment technologies.

To the extent possible, this STP identifies specific treatment facilities for treating the DOE-PGDP mixed waste and proposed schedules as set forth in the FFCA. Otherwise, to the extent possible, schedules for alternative activities such as waste characterization and technology assessment are provided. All schedule information presented is subject to change and funding availability. Assumptions and professional judgments related to the types of treatment technology, location of the treatment facility, contracting mechanism, project approval process, cost, and other factors were used to develop the estimated schedule.

Alternative, emerging, or new technologies not yet considered may be identified in the future and provide opportunities to manage waste more safely, effectively, and at lower cost than the current technologies in the PSTP. Working with regulators and others during the implementation of the STP, the DOE will continue to evaluate and develop risk abatement, performance, and life-cycle cost. If better options are identified, the DOE may request a modification of its STP in accordance with provisions of the STP.

A total of 167 mixed wastestreams have been identified as being generated or stored at the DOE-PGDP. The DOE-PGDP wastestreams were organized into treatment groups. Technologies were screened and treatment options were identified for each of these treatment groups. Options were then evaluated on the basis of ability to meet the criteria of regulatory compliance, environmental, health and safety, treatment effectiveness, ease of implementation, stakeholder concerns, life-cycle cost, and technology development. A treatment option was selected as a result of this evaluation process. These options were then blended along with the options of the other DOE sites, into a sensible national configuration of treatment systems. This STP reflects the "blending" as it affects the DOE-PGDP.

The options selected in the STPs may involve activities that are not currently funded in the approved site or project baselines and may not be incorporated into the project funding profiles. The DOE Headquarter's February 13, 1995, memorandum "Guidelines for Developing fiscal year 1997 Environmental Management Program" was followed in preparation of the STP. Implementation of the final treatment options will require consideration of available site or project funding which is subject to congressional appropriations.

The DOE-PGDP has approximately 1033.74 m³ of mixed waste. The following are the treatment options for the DOE-PGDP's wastestreams. All volumes are considered estimates based on the currently available information. The amount of organic containing liquids targeted for treatment at the TSCA Incinerator in Oak Ridge, Tennessee is 225.74 m³. The amount of combustible solids targeted for treatment at the TSCA Incinerator is 93.97 m³. The amount of cyanide bearing waste targeted for the Cyanide Treatment Facility in Oak Ridge, Tennessee is 0.78 m³. The amount of waste consisting of either solid or liquid inorganic chemicals that contain metal contaminants and/or considered to be corrosive targeted for treatment at the DGE-PGDP's C-400-D facility is 8.4 m³. The amount of sludge and debris waste targeted for commercial stabilization is 112.13 m³. The amount of Mixed Transuranic (TRU) waste targeted for the disposal at Waste Isolation Pilot Plant is 1.52 m³. Also, 588,24 m³ of waste requires further characterization to determine a proper treatment method.

The state issued an Unilateral Order on October 5, 1995 changing the wording and treatment dates proposed in the PSTP. As of October 16, the DOE has not determined whether to accept or appeal.

**PANTEX PLANT
FEDERAL FACILITY COMPLIANCE ACT
SITE TREATMENT PLAN/COMPLIANCE PLAN**

EXECUTIVE SUMMARY

The Pantex Plant, located in the panhandle of Texas near Amarillo, has had the primary mission of nuclear weapons production, evaluation, modification, surveillance, and dismantlement since the mid-late 1950's. These activities have generated a variety of low-level mixed wastes at the Pantex Plant. The Federal Facility Compliance Act (FFCA), enacted October 6, 1992, required federal facilities which generate or store mixed wastes to develop a treatment plan for these wastes. The FFCA provided for a three year period of sovereign immunity for RCRA storage requirements to allow for the development and implementation of the plan.

The U.S. Department of Energy (DOE) and the management and operating contractor, Mason & Hanger, Silas-Mason Co., Inc. have developed the Pantex Plant Site Treatment Plan/Compliance Plan (STP) to meet the requirements of the FFCA. The STP is the final step of a three-phase development process, which was designed by the DOE to facilitate public and state participation. The first phase, the Conceptual Site Treatment Plan, was submitted to the state in October 1993. The second phase, the Draft Site Treatment Plan, was submitted to the state in October 1994. The Proposed STP was submitted to the Texas Natural Resources Conservation Commission (TNRCC) on March 31, 1995. The plan was approved on September 27, 1995.

The STP presents DOE's preferred options for the treatment of mixed waste generated at Pantex, along with proposed schedules for development of these options. The preferred options consist of existing onsite treatment, development of mobile treatment units (MTUs) in accordance with the DOE Albuquerque Operations Office (AL) Mixed Waste Treatment Plan, and offsite commercial treatment.

The existing onsite treatment options are the burning ground and separating, surveying, and decontaminating. The MTU technologies and the DOE-AL sites responsible for development are macroencapsulation, stabilization, and barium sulfate precipitation (Pantex), packed bed reactor/silent discharge plasma (Sandia National Laboratory, New Mexico/Los Alamos National Laboratory), hydrothermal oxidation and plating waste skid (Los Alamos National Laboratory), thermal desorption and evaporative oxidation (Grand Junction Project Office), and amalgamation (Pinellas Plant). The MTUs will be operated in the Hazardous Waste Treatment and Processing Facility which is planned to be operational by the year 2001.

EXECUTIVE SUMMARY FOR THE PHNS PROPOSED SITE TREATMENT PLAN

The Federal Facility Compliance Act of 1992 (FFCA) requires the U.S. Department of Energy (DOE) to prepare Site Treatment Plans (STPs) to address treatment of mixed radioactive and hazardous waste for each DOE site which generates and stores mixed waste. These plans are to be submitted to the states (or the U.S. Environmental Protection Agency (EPA) in cases where the state has not been delegated authority to regulate mixed waste) for approval. Owing to the joint Navy/DOE nature of the Naval Nuclear Propulsion Program (NNPP) and pursuant to the legislative history of the FFCA, NNPP facilities which generate and store mixed waste, including Pearl Harbor Naval Shipyard (PHNS), are included in the FFCA process and have prepared STPs. The PHNS Proposed Site Treatment Plan (PSTP) is being provided to EPA Region IX for approval in accordance with the FFCA.

PHNS generates very small amounts of mixed waste as a result of maintenance and repair work performed on Naval nuclear propulsion plants. PHNS currently has approximately 3.60 cubic meters of mixed waste in storage, 5.76 cubic meters of mixed waste undergoing on-site processing, and projects to generate approximately 17.07 cubic meters over the next five years (17.02 cubic meters is expected to be placed in storage pending availability of treatment following completion of on-site processing). These amounts represent less than 0.016 percent of the total amount of mixed waste stored and generated at DOE facilities.

As outlined in an April 6, 1993 Federal Register notice (58 FR 17875 as modified in 60 FR 10840, February 28, 1995), the STPs were developed in three stages. Conceptual Site Treatment Plans (CSTPs), which identified the range of potentially feasible treatment options for each mixed waste stream, were completed and submitted to state and EPA regulators in October 1993. Draft Site Treatment Plans (DSTPs), completed and submitted to state and EPA regulators in August 1994, discussed the evaluation of treatment options and identified the site's preferred treatment option for each waste stream. PSTPs, which contain DOE's preferred options developed after evaluation and integration with the site-specific options in other sites' DSTPs, are being submitted to state and EPA regulators in March 1995. This three step process was intended to facilitate early interaction with the regulators and other stakeholders to maximize the likelihood that the STPs will ultimately be approved by October 1995 as required by the FFCA.

Prior to submittal of the DSTPs in August 1994, PHNS determined preferred treatment options for each waste stream by comparing all feasible treatment options (including on-site treatment, use of mobile treatment systems, commercial treatment, and treatment at other DOE facilities) in several fundamental areas (including regulatory compliance, treatment effectiveness, environment/health/safety concerns, cost, and implementability). This approach was used by all sites. Based on the very small volumes of PHNS's waste streams requiring treatment following completion of on-site processing, these evaluations indicated that off-site treatment at other facilities is economically and technically preferable to other options. PHNS identified potentially technically capable facilities for each waste stream based on an evaluation of available treatment facility information, then coordinated with the other sites to confirm treatment capability and select preferred options. Several of the preferred treatment

options now identified in the PSTP have been changed from those identified in the DSTP based on further evaluations to resolve technical uncertainties and based on the DOE Options Analysis Team (OAT) evaluations to improve the efficiency of the complex wide treatment configuration.

In addition to identifying the proposed treatment option for each PHNS mixed waste stream, the PSTP also identifies proposed schedules for shipment of each waste stream to the selected treatment facility, and proposed arrangements for pre-treatment storage and post-treatment residual management for each waste stream. A single schedule milestone, for shipment to the treatment facility within 18 months of the start of facility operations, is proposed for each waste stream. Thus, pre-treatment storage on-site at PHNS until the selected treatment facilities are available is proposed. Projected schedules for the start of operation of selected treatment facilities are identified. The PSTP also proposes commitments to perform additional evaluations and work with EPA Region IX to determine whether alternative treatment options should be selected in the event completion of a targeted treatment facility is delayed.

The following table contains a listing of the mixed waste streams and proposed treatment options identified in the PHNS PSTP. The table also identifies the proposed schedule milestones, projected shipping dates, and estimated costs for implementing each proposed treatment option. If the targeted treatment facilities are completed according to currently identified schedules, all of PHNS's mixed waste streams will be treated by 2001, and the total cost for treating all waste streams will be about \$470,000. PHNS and the NNPP believe the PHNS PSTP balances the concerns of expeditious completion of treatment, cost/efficiency, minimizing shipments, and minimizing risk/liability, and represents the best overall plan for achieving compliance with Land Disposal Restriction requirements for PHNS mixed waste.

Waste Stream ID #	Waste Stream Name	Current Inventory (M3)	5 Year Projected Inventory (M3)	Preferred Option	Facility Name	Projected Start Date of Facility Operation	Proposed Milestone	Projected Shipping Date	Estimated Cost
PH-W001	Chromate Resin	2.14	0.00	RL-S007	Hanford WRAP IIA Facility	Sep. 1999	Start of ops. + 18 months	Mar. 2001	\$85,426
PH-W002	Liquid Containing 1,1,1 Trichloroethane	0.02	0.00	IN-S005	INEL WERF Incinerator	Jan. 1996	Start of ops. + 18 months	Jul. 1997	\$33,323
PH-W003	Chromium and Lead Based Paint Chips	0.002	0.50	RL-S007	Hanford WRAP IIA Facility	Sep. 1999	Start of ops. + 18 months	Mar. 2001	\$38,086
PH-W004	Solid Waste Contaminated with Chromate	0.05	0.05	IN-S005	INEL WERF Incinerator	Jan. 1996	Start of ops. + 18 months	Jul. 1997	\$33,620
PH-W006	Elemental Lead	0.08	0.17	RL-S007	Hanford WRAP IIA Facility	Sep. 1999	Start of ops. + 18 months	Mar. 2001	\$33,755
PH-W007	Lead Contaminated Debris	0.04	0.10	RL-S007	Hanford WRAP IIA Facility	Sep. 1999	Start of ops. + 18 months	Mar. 2001	\$28,173
PH-W008	Brass and Bronze	0.60	0.90	RL-S007	Hanford WRAP IIA Facility	Sep. 1999	Start of ops. + 18 months	Mar. 2001	\$38,873
PH-W013	Filter Media with Dioctyl Phthalate	0.67	15.30	SE-S005	Scientific Ecology Group Inc.	Operational	PSTP scheduled approval + 12 months	Oct. 1996	\$179,085

EXECUTIVE SUMMARY

The Portsmouth Gaseous Diffusion Plant (PORTS) is owned by the U.S. Department of Energy (DOE) and is located in the south-central portion of Ohio in rural Pike County. The site's principal process is the separation of uranium isotopes through gaseous diffusion for uranium enrichment. In October 1992, Congressional passage of the Energy Policy Act of 1992 established the United States Enrichment Corporation (USEC). In accordance with the Act, USEC leases and operates the uranium enrichment facilities at PORTS. DOE's primary role at PORTS is in the areas of environmental restoration and waste management. USEC, as owner of the currently generated wastes, is responsible for treatment of these wastes.

DOE is required by Sect. 3021(b) of RCRA, as amended by the Federal Facilities Compliance Act (FFCA), to prepare site treatment plans for mixed waste (i.e., waste containing both radioactive and RCRA hazardous constituents). The PORTS Proposed Site Treatment Plan (PSTP) is being provided to the state of Ohio and others for review.

The DOE Portsmouth Site Office prepared this PSTP for mixed waste at PORTS. DOE is providing this PSTP for public and regulatory review in accordance with the April 6, 1993, Federal Register notice that requires DOE to submit site treatment plans for facilities at which DOE generates or stores mixed waste (58 FR 17875) according to the schedule published by DOE. The purpose of this PSTP is to identify the preferred options for treating the facility's mixed waste. To the extent feasible, this PSTP identifies specific treatment facilities for treating the mixed waste, including the location of the treatment facilities and proposed schedules as required in the FFCA.

A total of 79 mixed waste streams have been identified as being generated or in storage at PORTS. All the current and future mixed waste streams are potentially contaminated with low-level radioactive components; no transuranic or high-level waste streams are generated during PORTS operations and are not expected to be generated or stored at PORTS in the future. All current waste streams are believed to be sufficiently characterized to allow evaluation of treatment options. In the draft site treatment plan, these 79 waste streams were divided into 20 treatability groupings on the basis of waste characteristics; technologies were screened and treatment options established for each of these treatability groupings; and options were then evaluated on the basis of their ability to meet the requirements of regulatory compliance, environmental health and safety, treatment effectiveness, implementability, life cycle cost, and technology development. In this PSTP, options were further reevaluated such that consideration was also given to the Ohio Environmental Protection Agency comments, option refinements, and findings of the Options Analysis Team concerning the overall DOE waste management program. An additional evaluation criterion, stakeholder concerns, will be

considered after public and regulatory comments are available. A preferred option was selected for each treatability grouping as a result of this evaluation.

Section 3 of this Background Volume summarizes the evaluation process and presents the preferred treatment option as well as other options considered; details of the evaluation are given in Appendix A. Other significant portions of this volume include Sect. 1, which discusses the purpose and scope, presents details of the site, describes the mixed waste categories, and presents information concerning organization of the PSTP, framework for developing the DSTP, and a discussion of related documents and compliance agreements; Sect. 2, a summary of the technology development methodology used; Sect. 6, a discussion of the approach to addressing wastes to be generated in the future; Sect. 7, a description of RCRA storage facilities; and Sect. 8, an approach to disposal of treatment residuals. Appendix B is a summary of the Ohio Option; Appendix C is a summary of available analytical data; Appendix D is the public participation plan; and Appendix E provides detailed cost estimates for the preferred option and for other alternatives that were evaluated. Sections 4 and 5 are relatively minor since no TRU or high-level mixed wastes are generated or stored at PORTS and are not expected to be generated or stored at PORTS in the future.

The Background Volume (Volume I) of the PSTP is a comprehensive background and analysis document that addresses the technical requirements of the FFCAct. It includes a discussion of each alternative considered for each waste stream or group of waste streams. It also includes a discussion of the proposed options' implementation as considered by the DOE Options Analysis Team. This includes the use of vendor supplied and operated mobile treatment units and the location of all treatment. In Appendix A to Volume I, the evaluation process itself and the selection of the preferred option are presented. Included here is the numerical scoring of alternatives considered and the logic for scoring.

The Compliance Plan (Volume II) of the PSTP for PORTS, is the document by which treatment of mixed waste at PORTS will be conducted. It specifically addresses those items required by the FFCAct and is formatted to accept revisions on an annual basis. The preferred option for each waste stream or group of waste streams (grouped by treatability) is presented here, along with a proposed schedule for each preferred option selected. The target schedules as defined in this document are based on the most recent prioritization of estimated 5-year target budgets.

Treatment schedules in the final PSTP are not the same as those presented in the December 1994 draft PSTP. The DOE budget cuts in late December resulted in revised target dates and thus required changes in the treatment schedules. Aqueous wastes, which were projected in the draft plan to be completed by 2001, are now scheduled to be completed in 2009. Likewise, soils contaminated with VOCs were originally scheduled to be treated by fourth quarter 2008 but are now scheduled to be completed by the second quarter, 2011.

The schedules in this Proposed Plan have not yet been integrated with those of other DOE sites from a technical, complex-wide perspective. Moreover, DOE faces increasingly tight budgets throughout the DOE complex and anticipates that funding will continue to be constrained. The schedules in this and other Plans reflect those constraints. DOE has asked regulatory agencies to work with DOE and other interested parties at the site and National level to assist DOE in prioritizing its activities.

EXECUTIVE SUMMARY FOR THE PNS PROPOSED SITE TREATMENT PLAN

The Federal Facility Compliance Act of 1992 (FFCA) requires the U.S. Department of Energy (DOE) to prepare Site Treatment Plans (STPs) to address treatment of mixed radioactive and hazardous waste for each DOE site which generates and stores mixed waste. These plans are to be submitted to the states (or the U.S. Environmental Protection Agency (EPA) in cases where the state has not been delegated authority to regulate mixed waste) for approval. Owing to the joint Navy/DOE nature of the Naval Nuclear Propulsion Program (NNPP) and pursuant to the legislative history of the FFCA, NNPP facilities which generate and store mixed waste, including Portsmouth Naval Shipyard (PNS), are included in the FFCA process and have prepared STPs. The PNS Proposed Site Treatment Plan (PSTP) is being provided to EPA Region I for approval in accordance with the FFCA.

PNS generates very small amounts of mixed waste as a result of maintenance and repair work performed on Naval nuclear propulsion plants. PNS currently has approximately 0.77 cubic meters of mixed waste in storage, 0.0 cubic meters of mixed waste undergoing on-site processing and projects to generate approximately 2.99 cubic meters over the next five years (0.55 cubic meters of the 2.99 cubic meters is expected to be placed in storage pending availability of treatment following completion of on-site processing). These amounts represent less than 0.002 percent of the total amount of mixed waste stored and generated at DOE facilities.

As outlined in an April 6, 1993 Federal Register notice (58 FR 17875 as modified in 60 FR 10840, February 28, 1995), the STPs were developed in three stages. Conceptual Site Treatment Plans (CSTPs), which identified the range of potentially feasible treatment options for each mixed waste stream, were completed and submitted to state and EPA regulators in October 1993. Draft Site Treatment Plans (DSTPs), completed and submitted to state and EPA regulators in August 1994, discussed the evaluation of treatment options and identified the site's preferred treatment option for each waste stream. PSTPs, which contain DOE's preferred options developed after evaluation and integration with the site-specific options in other site's DSTPs, are being submitted to state and EPA regulators in March 1995. This three step process was intended to facilitate early interaction with the regulators and other stakeholders to maximize the likelihood that the STPs will ultimately be approved by October 1995 as required by the FFCA.

Prior to submittal of the DSTPs in August 1994, PNS determined preferred treatment options for each waste stream by comparing all feasible treatment options (including on-site treatment, use of mobile treatment systems, commercial treatment, and treatment at other DOE facilities) in several fundamental areas (including regulatory compliance, treatment effectiveness, environment/health/safety concerns, cost, and implementability). This approach was used by all sites. Based on the very small volumes of PNS waste streams requiring treatment following completion of on-site processing, these evaluations indicated that off-site treatment

at other DOE facilities is economically and technically preferable to other options. PNS identified potentially technically capable DOE facilities for each waste stream based on an evaluation of available treatment facility information, then coordinated with the other DOE sites to confirm treatment capability and select preferred options. Several of the preferred treatment options now identified in the PSTP have been changed from those identified in the DSTP based on further evaluations to resolve technical uncertainties and based on the DOE Options Analysis Team (OAT) evaluations to improve the efficiency of the complex wide treatment configuration.

In addition to identifying the proposed treatment option for each PNS mixed waste stream, the PSTP also identifies proposed schedules for shipment of each waste stream to the selected treatment facility, and proposed arrangements for pre-treatment storage and post-treatment residual management for each waste stream. A single schedule milestone, for shipment to the treatment facility within 18 or 24 months of the start of facility operations, is proposed for each waste stream. Thus, pre-treatment storage on-site at PNS until the selected treatment facilities are available is proposed. Projected schedules for the start of operation of selected treatment facilities are identified. The PSTP also proposes commitments to perform additional evaluations and work with EPA Region I to determine whether alternative treatment options should be selected in the event completion of a targeted treatment facility is delayed.

The following table contains a listing of the mixed waste streams and proposed treatment options identified in the PNS PSTP. The table also identifies the proposed schedule milestones, projected shipping dates, and estimated costs for implementing each proposed treatment option. If the targeted treatment facilities are completed according to currently identified schedules, all of PNS's mixed waste streams will be treated by 2001, and the total cost for treating all waste streams will be approximately \$153,000. PNS and the NNPP believe the PNS PSTP balances the concerns of expeditious completion of treatment, cost/efficiency, minimizing shipments, and minimizing risk/liability, and represents the best overall plan for achieving compliance with Land Disposal Restriction requirements for PNS mixed waste.

Waste Stream ID #	Waste Stream Name	Current Inventory (M3)	5 Year Projected Inventory (M3)	Preferred Option	Facility Name	Projected Start Date of Facility Operation	Proposed Milestone	Projected Shipping Date	Estimated Cost
PN-W001	Lead Contaminated Debris	0.142	0.00	RL-S007	Hanford WRAP IIA Facility	Sep. 1999	Start of ops. + 18 months	Mar. 2001	\$25,936
PN-W002	Paint Chips Containing Lead and Chromium	0.00	0.20	RL-S007	Hanford WRAP IIA Facility	Sep. 1999	Start of ops. + 18 months	Mar. 2001	\$25,614
PN-W003	Solidified Resin with Chromium	0.21	0.00	RL-S007	Hanford WRAP IIA Facility	Sep. 1999	Start of ops. + 18 months	Mar. 2001	\$30,889
PN-W004	Brass and Bronze	0.42	0.13	RL-S007	Hanford WRAP IIA Facility	Sep. 1999	Start of ops. + 18 months	Mar. 2001	\$27,629
PN-W005	Air Filters Containing Lead	0.00	0.185	RL-S007	Hanford WRAP IIA Facility	Sep. 1999	Start of ops. + 18 months	Mar. 2001	\$28,660
PN-W015	Solids Containing Potassium Chromate	0.00	0.03	SR-S018	Savannah River CIF	Feb. 1996	Start of ops. + 24 months	Feb. 1998	\$10,200

EXECUTIVE SUMMARY FOR THE PSNS PROPOSED SITE TREATMENT PLAN

The Federal Facility Compliance Act of 1992 (FFCA) requires the U.S. Department of Energy (DOE) to prepare Site Treatment Plans (STPs) to address treatment of mixed radioactive and hazardous waste for each DOE site which generates and stores mixed waste. These plans are to be submitted to the states (or the U.S. Environmental Protection Agency (EPA) in cases where the state has not been delegated authority to regulate mixed waste) for approval. Owing to the joint Navy/DOE nature of the Naval Nuclear Propulsion Program (NNPP) and pursuant to the legislative history of the FFCA, NNPP facilities which generate and store mixed waste, including Puget Sound Naval Shipyard (PSNS), are included in the FFCA process and have prepared STPs. The PSNS Proposed Site Treatment Plan (PSTP) is being submitted to Washington Department of Ecology for approval in accordance with the FFCA.

PSNS generates very small amounts of mixed waste as a result of maintenance and repair work performed on Naval nuclear propulsion plants. PSNS currently has approximately 45.07 cubic meters of mixed waste in storage, 60.77 cubic meters of mixed waste undergoing on-site processing, and projects to generate approximately 734.98 cubic meters over the next five years (of this 734.98 cubic meters, 36.43 cubic meters is expected to be placed in storage pending availability of treatment following completion of on-site processing). These amounts represent less than 0.25 percent of the total amount of mixed waste stored and generated at DOE facilities.

PSNS also generates defueled decommissioned reactor compartment disposal packages for burial at Hanford. These reactor compartments are mixed waste because they contain lead; however, treatment of this mixed waste is not required because the macroencapsulation treatment standard for lead is already met as the packages are originally constructed. PSNS projects that over the next 5 years reactor compartment disposal packages totaling 37,000 cubic meters will be shipped to Hanford.

As outlined in an April 6, 1993 Federal Register notice (58 FR 17875 as modified in 60 FR 10840, February 28, 1995), the STPs were developed in three stages. Conceptual Site Treatment Plans (CSTPs), which identified the range of potentially feasible treatment options for each mixed waste stream, were completed and submitted to state and EPA regulators in October 1993. Draft Site Treatment Plans (DSTPs), completed and submitted to state and EPA regulators in August 1994, discussed the evaluation of treatment options and identified the site's preferred treatment option for each waste stream. PSTPs, which contain DOE's preferred options developed after evaluation and integration with the site-specific options in other sites' DSTPs, are being submitted to state and EPA regulators in March 1995. This three step process was intended to facilitate early interaction with the regulators and other stakeholders to maximize the likelihood that the STPs will ultimately be approved by October 1995 as required by the FFCA.

Prior to submittal of the DSTPs in August 1994, PSNS determined preferred treatment options for each waste stream by comparing all feasible treatment options (including on-site treatment, use of mobile treatment systems, commercial treatment, and treatment at other DOE facilities) in several fundamental areas (including regulatory compliance, treatment effectiveness, environment/health/safety concerns, cost, and implementability). This approach was used by all sites. Based on the very small volumes of PSNS waste streams requiring treatment following completion of on-site processing, these evaluations indicated that off-site treatment at other facilities is economically and technically preferable to other options. PSNS identified potentially technically capable facilities for each waste stream based on an evaluation of available treatment facility information, then coordinated with the other sites to confirm treatment capability and select preferred options. Several of the preferred treatment options now identified in the PSTP have been changed from those identified in the DSTP based on further evaluations to resolve technical uncertainties and based on the DOE Options Analysis Team (OAT) evaluations to improve the efficiency of the complex wide treatment configuration.

In addition to identifying the proposed treatment option for each PSNS mixed waste stream, the PSTP also identifies proposed schedules for shipment of each waste stream to the selected treatment facility, and proposed arrangements for pre-treatment storage and post-treatment residual management for each waste stream. A single schedule milestone, for shipment to the treatment facility within 18 months of the start of facility operations, is proposed for each waste stream. Thus, pre-treatment storage on-site at PSNS until the selected treatment facilities are available is proposed. Projected schedules for the start of operation of selected treatment facilities are identified. The PSTP also proposes commitments to perform additional evaluations and work with the Washington Department of Ecology to determine whether alternative treatment options should be selected in the event completion of a targeted treatment facility is delayed.

The following table contains a listing of the mixed waste streams and proposed treatment options identified in the PSNS PSTP. The table also identifies the proposed schedule milestones, projected shipping dates, and estimated costs for implementing each proposed treatment option. If the targeted treatment facilities are completed according to currently identified schedules, the majority of PSNS's mixed waste streams will be treated by 2001, and the total cost for treating all waste streams will be about \$809,000. PSNS and the NNPP believe the PSNS PSTP balances the concerns of expeditious completion of treatment, cost/efficiency, minimizing shipments, and minimizing risk/liability, and represents the best overall plan for achieving compliance with Land Disposal Restriction requirements for PSNS mixed waste.

Waste Stream ID #	Waste Stream Name	Current Inventory (M3)	5 Year Projected Inventory (M3)	Preferred Option	Facility Name	Projected Start Date of Facility Operation	Proposed Milestone	Projected Shipping Date	Estimated Cost
PS-W001	Organic Debris with Heavy Metals	4.54	2.14	RL-S007	Hanford WRAP IIA Facility	Sep. 1999	Start of ops. + 18 months	Mar. 2001	\$40,000
PS-W002	Paint Chips with Heavy Metals	0.53	1.05	RL-S007	Hanford WRAP IIA Facility	Sep. 1999	Start of ops. + 18 months	Mar. 2001	\$15,726
PS-W004	Liquid with F-Listed Solvents	0.25	0.00	IN-S005	INEL WERF Incinerator	Jan. 1996	Start of ops. + 18 months	Jul. 1997	\$9,120
PS-W005	Debris with F-Listed Solvents	6.72	0.00	IN-S005	INEL WERF Incinerator	Jan. 1996	Start of ops. + 18 months	Jul. 1997	\$67,948
PS-W006	Solidified Liquid with F-Listed Solvents	0.84	0.00	IN-S005	INEL WERF Incinerator	Jan. 1996	Start of ops. + 18 months	Jul. 1997	\$28,831
PS-W007	Debris with Heavy Metals and PCBs	3.11	0.50	IN-S015	INEL IWPF Incinerator	Not Available	Start of ops. + 18 months	Not Available	\$31,595
PS-W009	Paint Thinner with Butyl Alcohol	0.02	0.00	IN-S005	INEL WERF Incinerator	Jan. 1996	Start of ops. + 18 months	Jul. 1997	\$8,967
PS-W010	Non-Compressed Filter Media with Dioctyl Phthalate	16.33	19.62	SE-S005	Scientific Ecology Group Inc.	Operational	PSTP scheduled approval + 12 months	Oct. 1996	\$354,443
PS-W011	Debris with heavy Metals and F-Listed Solvents	0.19	0.00	IN-S005	INEL WERF Incinerator	Jan. 1996	Start of ops. + 18 months	Jul. 1997	\$9,841
PS-W012	Paint Chips with Heavy Metals and PCBs	0.03	0.23	IN-S015	INEL IWPF Incinerator	Not Available	Start of ops. + 18 months	Not Available	\$10,064
PS-W013	Elemental Lead	0.17	1.10	RL-S007	Hanford WRAP IIA Facility	Sep. 1999	Start of ops. + 18 months	Mar. 2001	\$46,843
PS-W014	Particulates with Heavy Metals	0.05	0.33	RL-S007	Hanford WRAP IIA Facility	Sep. 1999	Start of ops. + 18 months	Mar. 2001	\$7,242
PS-W017	Inorganic Debris with Heavy Metals	7.11	9.28	RL-S007	Hanford WRAP IIA Facility	Sep. 1999	Start of ops. + 18 months	Mar. 2001	\$128,945
PS-W018	Acidic Liquids with Heavy Metals and Toxic Inorganics	0.30	0.00	RL-S007	Hanford WRAP IIA Facility	Sep. 1999	Start of ops. + 18 months	Mar. 2001	\$4,717
PS-W019	Filters with Asbestos and Dioctyl Phthalate	2.18	2.18	IN-S005	INEL WERF Incinerator	Jan. 1996	Start of ops. + 18 months	Jul. 1997	\$13,924
PS-W020	Compressed Filter Media with Dioctyl Phthalate	2.70	0.00	IN-S005	INEL WERF Incinerator	Jan. 1996	Start of ops. + 18 months	Jul. 1997	\$30,790

SITE TREATMENT PLAN
FOR
THE RMI TITANIUM COMPANY
EXTRUSION PLANT

EXECUTIVE SUMMARY

October 6, 1995

SITE TREATMENT PLAN
FOR
THE RMI TITANIUM COMPANY
EXTRUSION PLANT

EXECUTIVE SUMMARY

On October 6, 1992, the Federal Facility Compliance Act (FFCAct) was signed into law. The Act directs the U. S. Department of Energy (DOE) to prepare a Site Treatment Plan (STP) for each DOE Site generating or storing mixed waste (A mixed waste is a waste material that contains both radioactive and hazardous constituents). The STP's provide details on the planned treatment of these DOE mixed wastes. Each site's plan must provide a list or inventory of the mixed waste, treatment technology required and the approach or treatment facility that will be used to treat the waste.

This Plan is a result of a three phase development process. A Conceptual Site Treatment Plan (CSTP) which included a mixed waste inventory with potential treatment technologies and a range of treatment options was developed in October of 1993. This was followed in August of 1994 by a Draft Site Treatment Plan in which the treatment options identified in the CSTP were narrowed down to a few or only one preferred option for each waste stream. The Site Treatment Plan contains the preferred option and the treatment schedule for each waste stream. This is the final stage of the STP process. The Site Treatment Plan is subject to approval by the Ohio EPA (OEPA) for the RMI Extrusion Plant Decommissioning Project (RMIDP). The Compliance Plan, along with the Ohio EPA Director's Findings and Orders was approved October 4, 1995.

The PSTP, like the DSTP consisted of two major sections or volumes: the Background Volume and the Plan Volume. The Background Volume provided an extensive discussion of the waste streams and proposed options. The Plan Volume is a shorter, more focused description of the plans and schedules for disposition of the wastes.

The Background Volume consists of the following six sections:

- Section 1. Introduction. This section discusses the Purpose and Scope, Site History and Mission, Framework for Developing the STP, The Plan Organization and Related Activities.
- Section 2. Methodology. This includes discussions of Assumptions, Preferred Selection Process, Coordination with Regulatory Agencies and Stakeholders, Characterization of Mixed Waste and Waste Minimization.
- Section 3. Low Level Mixed Waste Stream. For each mixed waste stream this section provides a discussion of the waste stream, treatment technology needed and the preferred option.
- Section 4. Future Generation of Mixed Wastes. This section identifies, as much as possible, mixed wastes not identified in Section 3 that could result from future restoration or site remediation activities.
- Section 5. Storage Report. This section discusses the adequacy of the Site's waste storage facilities.

- Section 6. Process for Evaluating Disposal Issues in Support of the STP. This summarizes the overall DOE activity in the area of disposal of mixed waste treatment residuals.

The Plan Volume is a shorter, more focused document consisting of the following sections:

- Section 1. Purpose and Scope of the Compliance Plan
- Section 2. Low Level Mixed Waste Schedules. This section identifies milestones and target dates for disposition of each mixed waste stream and option. Table 2-1 illustrates the schedule and milestones for treatment.

The following is a summary matrix of the RMI Waste Streams, Preferred Treatment Options and Inventory.

Waste Type	Preferred Treatment	Current Inventory	5 yr. Projected Inventory
Aqueous Liquids	Incineration	1480 kg.	3590 kg.
Organic Liquids	Incineration	1110 kg.	430 kg.
Inorganic Debris	Precipitation and Stabilization	6598 kg.	506 kg.
Organic Debris	Incineration	1879 kg.	366 kg.
Inorganic Sludge	Precipitation and Stabilization	0 kg.	468 kg.

As discussed above, Chapter 3 of the Background Volume provides more detail on each of the items in this matrix

The schedules in RMI Site Treatment Plan have not yet been integrated with those of other DOE sites from a technical, complex-wide perspective. Moreover, DOE faces increasingly tight budgets throughout the DOE complex and anticipates that funding will continue to be constrained. The schedules in this and other Plans reflect those constraints. DOE has asked regulatory agencies to work with DOE and other interested parties at the national level to assist DOE in prioritizing its activities.

Table 2-1

RMI MIXED WASTE STREAM TREATMENT SCHEDULE

Waste Stream	Treatment Option	Scheduled Activity	Target	Milestone
TCE Contaminated Bail Water	ORO TSCA Incinerator	Negotiate with treatment facility	-----	JUN 1996
		Characterize for Treatment	-----	SEPT 1996
		Package for Shipment	-----	JUN 1997
		Ship to ORO TSCA Incinerator	-----	AUG 1997
Lathe Oil Coolant Waste	ORO TSCA Incinerator	Negotiate with treatment facility	-----	JUN 1996
		Characterize for Treatment	-----	SEPT 1996
		Package for Shipment	-----	JUN 1997
		Ship to ORO TSCA Incinerator	-----	AUG 1997
Pump Station Accumulator Oil	ORO TSCA Incinerator	Negotiate with treatment facility	-----	JUN 1996
		Characterize for Treatment	-----	SEPT 1996
		Package for Shipment	-----	JUN 1997
		Ship to ORO TSCA Incinerator	-----	AUG 1997
Chlorinated Stoddard Solvents	ORO TSCA Incinerator	Negotiate with treatment facility	-----	JUN 1996
		Characterize for Treatment	-----	SEPT 1996
		Package for Shipment	-----	JUN 1997
		Ship to ORO TSCA Incinerator	-----	AUG 1997
Floor Stripper Chlorinated Solvent	ORO TSCA Incinerator	Negotiate with treatment facility	-----	JUN 1997
		Characterize for Treatment	-----	SEPT 1997
		Package for Shipment	-----	JUN 1998
		Ship to ORO TSCA Incinerator	-----	AUG 1998
Salt Bath Brick	Commercial Facility	Contract with treatment facility	-----	JUN 1997
		Characterize for Treatment	-----	SEPT 1997
		Package for Shipment	-----	JUN 1998
		Ship to Commercial Facility	-----	AUG 1998
Salt Bath Floor Sweepings	Commercial Facility	Contract with treatment facility	-----	JUN 1997
		Characterize for Treatment	-----	SEPT 1997
		Package for Shipment	-----	JUN 1998
		Ship to Commercial Facility	-----	AUG 1998
Salt Bath Pads and Gloves	Commercial Facility	Contract with treatment facility	-----	JUN 1997
		Characterize for Treatment	-----	SEPT 1997
		Package for Shipment	-----	JUN 1998
		Ship to Commercial Facility	-----	AUG 1998
Solid Die Head Residue	Commercial Facility	Contract with treatment facility	-----	JUN 1997
		Characterize for Treatment	-----	SEPT 1997
		Package for Shipment	-----	JUN 1998
		Ship to Commercial Facility	-----	AUG 1998
Solid Lathe Oil Coolant Waste	Commercial Facility	Contract with treatment facility	-----	JUN 1997
		Characterize for Treatment	-----	SEPT 1997
		Package for Shipment	-----	JUN 1998
		Ship to Commercial Facility	-----	AUG 1998
Solid Pump Station Accumulator Oil	Commercial Facility	Contract with treatment facility	-----	JUN 1997
		Characterize for Treatment	-----	SEPT 1997
		Package for Shipment	-----	JUN 1998
		Ship to Commercial Facility	-----	AUG 1998
Chlorinated/Stoddard Solvent (solid)	Commercial Facility	Contract with treatment facility	-----	JUN 1997
		Characterize for Treatment	-----	SEPT 1997
		Package for Shipment	-----	JUN 1998
		Ship to Commercial Facility	-----	AUG 1998

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Executive Summary

This Proposed Site Treatment Plan has been prepared pursuant to Section 3021(b) of the Resource Conservation and Recovery Act, as amended by the Federal Facility Compliance Act of 1992. The plan describes the development of treatment technologies and capacities for treating mixed radioactive and hazardous waste that is subject to the Resource Conservation and Recovery Act Land Disposal Restriction regulations. The plan will be submitted to the Colorado Department of Public Health and Environment for approval, approval with modification, or disapproval. Upon approval of the plan, the Colorado Department of Public Health and Environment will issue a Compliance Order requiring implementation of the plan.

This Proposed Site Treatment Plan consists of a Background Volume and a Compliance Plan Volume. The Background Volume provides information on the process by which the plan was prepared and technical information on the treatment technologies considered during the preparation of the plan. The Compliance Plan Volume describes implementing procedures and provides schedules proposed to be used in the Compliance Order which will be issued by the Colorado Department of Public Health and Environment.

The schedules in this Proposed Site Treatment Plan have not yet been integrated with those of other Department of Energy sites from a technical, complex-wide perspective. Moreover, the Department of Energy faces increasingly tight budgets throughout the complex and anticipates that funding will continue to be constrained. The schedules in this and other sites' plans reflect those constraints. The Department of Energy has asked regulatory agencies to work with the Department and other interested parties at the site and national level to assist the Department in prioritizing its environmental activities. Through this process, the Department of Energy expects that some schedules will be revised before the Site Treatment Plans are approved and orders issued.

This Proposed Site Treatment Plan addresses the treatment of approximately 3,800 cubic meters of solid and liquid mixed low-level waste and 300 cubic meters of solid and liquid transuranic wastes in storage at the site. An additional 5,708 cubic meters of stored mixed low-level waste referred to as Pondcrete and 1,086 cubic meters of Solar Pond Sludge may require treatment as mixed low-level waste, depending on the final Operable Unit 4 closure decision. The projected waste generation rates for the next five years are estimated in the Background Volume as 4,000 cubic meters of mixed low-level waste and 186 cubic meters of mixed transuranic waste requiring treatment.

Mixed low-level wastes are identified for treatment to meet the Land Disposal Restriction treatment standards. Mixed transuranic wastes are proposed for disposal at the Waste Isolation Pilot Plant after any treatment required to ensure these waste are acceptable for transportation to, and disposal at, the Waste Isolation Pilot Plant.

Specific inventory summary information is included for those mixed low-level wastes and mixed transuranic wastes requiring treatment under this plan. It also includes an identification, by waste form, of those wastes for which treatment capacity currently exists, as well as an identification of those wastes for which treatment technologies exist but require adaptation for treatment of mixed wastes.

This plan provides for the characterization of the wastes stored at the Rocky Flats Environmental Technology Site to determine which, if any, waste forms already meet the Land Disposal Restriction standards. Characterization will also gather information necessary to support development of treatment technologies and treatment capacity necessary to treat mixed wastes that do not currently meet the land disposal restriction treatment standards.

This plan identifies technologies suitable for treating mixed wastes from the Rocky Flats Environmental Technology Site so that they comply with the applicable land disposal criteria and can be disposed of when appropriate disposal sites are identified. The plan proposes that onsite microencapsulation, macroencapsulation, and solvent removal treatment systems be designed and installed to treat mixed wastes generated and stored at the Rocky Flats Environmental Technology Site.

This plan describes the development and construction of treatment systems for the onsite treatment of the mixed wastes presently stored at the Rocky Flats Environmental Technology Site. Three treatment systems are planned for treatment of mixed low-level wastes and a fourth system, if required, is planned for treatment of mixed transuranic wastes. The plan also contains the Rocky Flats Environmental Technology Site proposed schedules for developing technologies and treatment capacities for treatment of mixed low-level and mixed transuranic wastes. At any time during the planning and development of these onsite treatment systems, new information may be received that indicates that an offsite treatment alternative is more advantageous to the government. In this circumstance the offsite alternative may be selected and the development of onsite capability may be terminated.

This Proposed Site Treatment Plan also proposes shipping a small volume of mixed low-level wastes to existing or planned offsite facilities for treatment. The plan provides for the use of offsite treatment at commercial and Department of Energy facilities for eight mixed low-level waste forms presently stored at the Rocky Flats Environmental Technology Site.

Upon completion of the treatment of the stored wastes and development of the capacity to treat newly generated wastes in a timely fashion, the Site Treatment Plan will be deemed completed and the Compliance Order terminated.

**Compliance Order
and
Site Treatment Plan
for
Mixed Waste**

Executive Summary

**Sandia National Laboratories/
New Mexico**

October 6, 1995

EXECUTIVE SUMMARY

Sandia National Laboratories, New Mexico (SNL/NM) is a research and development facility managed and operated for the U.S. Department of Energy (DOE) by Sandia Corporation, a Lockheed Martin Company. For each DOE facility that generates or stores mixed waste, the Federal Facility Compliance Act (FFCAct) of October 6, 1992, requires DOE to prepare a plan to treat mixed waste to the standards of the Land Disposal Restrictions (LDRs). This Compliance Order (Order), which includes the Site Treatment Plan (STP), was approved and issued by the New Mexico Environment Department (NMED). The Order requires the treatment of the existing mixed waste (as of September 30, 1994) by the treatment technologies presented as preferred treatment options according to the schedules in the Compliance Plan Volume of the STP and the provisions of the Order.

This STP comprises two volumes: the Compliance Plan Volume (Exhibit A of the Order) proposes overall schedules for achieving compliance with the LDRs; the Background Volume (Exhibit B of the Order) contains detailed discussion of the waste streams and the preferred treatment options, which is provided for informational purposes only. A Proposed STP was submitted to the State on March 31, 1995 and was the basis for discussions prior to the issuance of the Order by the NMED. The Background Volume was issued as proposed and the Compliance Plan Volume was revised by the NMED and issued with the Order on October 6, 1995.

Unique tests and experimental programs at SNL/NM and SNL/CA have generated low volumes of a broad variety of mixed wastes. Approximately 150 waste streams have been accumulated since 1989 with a volume of approximately 70 cubic meters of existing waste. The waste has been combined into 16 treatability groups, each with a preferred treatment option, as shown in Table ES-1. (Note that there is no inventory at SNL/NM for Treatability Group 15, Soils with <50% Debris. However, this treatability group name has been retained for purposes of addressing future generated in this treatability group.) Exhibit A of the Order (Compliance Plan Volume) provides compliance schedules for these treatability groups in addition to schedules for treatment of mixed TRU waste, if necessary.

The mixed waste treatment plan at SNL/NM is heavily integrated with the work at other DOE sites that are tasked with developing mobile treatment units for use at multiple sites. This development involves proving-in new applications of technologies that are currently available but will require testing through treatability studies, as allowed by the RCRA regulations. The treatability studies are performed to assure that the treatments are appropriate for the specific waste streams and to assist in development of operating procedures and health and safety plans that protect the workers and the environment.

Other waste is being studied for on-site treatment by SNL/NM methods because of the material's unique nature or handling requirements, such as for explosives, or for development of treatment procedures that will facilitate eventual disposal, such as those required by the Nevada Operations Office for disposal of low-level waste at the Nevada Test Site. Off-site commercial treatment and disposal is an option for a small volume of scintillation cocktails and for waste that may not be treatable to meet the waste acceptance criteria of the Nevada Test Site.

Enforceable compliance dates and specified treatment technologies and related activities are included in the Compliance Plan Volume, based on the activities specified in the FFCAct for which schedules are required. Dates for activities required for treatment of waste at SNL reflect the integrated approach of the DOE sites of the Albuquerque Operations Office complex. The management of the integrated mixed waste treatment program is assigned to the Grand Junction Projects Office, Colorado, for coordination of development and deployment of the mobile treatment units. Permitting of the mobile units is being addressed by the DOE in coordination with the National Governors Association and the Western Governors Association.

Table ES-1 Summary of SNL/NM Mixed Waste, Preferred Options, and Compliance Schedules

Treatability Group # and Volume	TG Description	Preferred Treatment Option	Treatment Site and Facility	Begin Treating Mixed Waste	Complete Treatment of Existing Mixed Waste
TG 1 2.7 m ³ Neutron Generators are 2.54 m ³ of the 2.7 m ³	Inorganic Debris w/Explosive	Deactivation Radionuclide Separation for the Neutron Generators	On-site Treatability Study On-site Disassembly	December 31, 1997 Complete volume estimate comparing with and without radionuclide separation by December 31, 1995.	December 31, 1998 Complete cost estimate comparing with and without radionuclide separation by March 31, 1996.
TG 2 0.04 m ³	Inorganic Debris w/Water Reactive	Deactivation	On-site Treatability Study	December 31, 1997	December 31, 1998
TG 3 0.02 m ³	Reactive Metals	Deactivation	On-site Treatability Study	December 31, 1997	December 31, 1998
TG 4 0.04 m ³	Elemental Lead	Macro-encapsulation	On-site using Pantex Mobile Treatment Unit	February 15, 2002	May 10, 2002
TG 5 0.02 m ³	Aqueous Liquids (Corrosives)	Neutralization fb Stabilization	On-site Treatability Study	December 31, 1997	December 31, 1998
TG 6 67 ml	Elemental Mercury	Amalgamation	On-site using Pinellas Mobile Treatment Unit	May 27, 1998	July 7, 1998
TG 7 0.2 m ³	Organic Liquids I	Incineration	Off-site Commercial Facility	Ship off-site by September 30, 1996	Provide waste receipt to NMED within 45 days.
TG 8 28 m ³	Organic Debris w/Organic Contaminant	Thermal Desorption	On-site using GJPO Mobile Treatment Unit	August 11, 1999	July 27, 2000
TG 9 7 m ³	Inorganic Debris w/TCLP Metals	Macro-encapsulation	On-site using Pantex Mobile Treatment Unit	February 15, 2002	May 10, 2002
TG 10 29 m ³	Heterogeneous Debris	Sort/Reclassify	On-site	Begin sorting on or before June 30, 1995	No end date identified
TG 11 2.7 m ³	Organic Liquids II	Hydrothermal Processing (Technology to be developed)	On-site using LANL Mobile Treatment Unit	Treatment Schedules to NMED for approval by November 30, 1998.	NA
TG 12 0.6 m ³	Organic Debris w/TCLP Metals	Macro-encapsulation	On-site using Pantex Mobile Treatment Unit	February 15, 2002	May 10, 2002
TG 13 0.01 m ³	Oxidizers	Deactivation fb Stabilization	On-site Treatability Study	December 31, 1997	December 31, 1998
TG 14 0.01 m ³	Aqueous Liquids with Organic Contaminant	Evaporative Oxidation	Treatability Study at GJPO	October 23, 2000	January 26, 2001
TG 15 0.0 m ³	Soils with < 50% Debris	NA (not in inventory at SNL/NM)	NA (not in inventory at SNL/NM)	NA	NA
TG 16 0.001 m ³	Cyanide	Oxidation	Treatability Study at LANL	August 15, 2001	September 1, 2001
Mixed TRU Waste	Mixed TRU Waste	To Be Determined	To Be Determined	6 months after NMED permit issuance.	December 31, 2010



Department of Energy

Oak Ridge Operations

Weldon Spring Site

Remedial Action Project Office

7295 Highway 94 South

St. Charles, Missouri 63304

EXECUTIVE SUMMARY

WELDON SPRING SITE TREATMENT PLAN AND CONSENT ORDER

The Weldon Spring Site (WSS) is located in St. Charles County, Missouri, about 30 miles west of St. Louis. The site consists of two geographically distinct areas: the 217-acre chemical plant area and a 9-acre limestone quarry, which is about 4 miles south-southwest of the chemical plant area.

The U.S. Environmental Protection Agency (EPA) listed the quarry on the National Priorities List (NPL) in 1987, and the chemical plant area was added to this listing in 1989. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Record of Decision (ROD) for the quarry was signed by the EPA in September 1990 and by the DOE in March 1991. The ROD for remediation of the chemical plant area was signed in September 1993.

The inventory of mixed low-level waste (MLLW) at the Weldon Spring site is composed almost entirely of containerized materials resulting from consolidation and containerization of waste chemicals abandoned at the facility and from hazardous debris generated during building dismantlement. Mixed waste is waste that contains both radioactive and hazardous components. Wastes in this current inventory have been characterized by a combination of process knowledge and sampling and analysis. Additional mixed waste may be generated over the next 5 years from various cleanup and consolidation activities.

The Federal Facility Compliance Act (FFCA) requires DOE sites to prepare site treatment plans describing the development of treatment capacities and technologies for treating mixed waste. The plan was developed in three phases: (1) a "Conceptual Site Treatment Plan" - completed in October 1993, (2) a "Draft Site Treatment Plan" - completed in August 1994, and (3) a "Proposed Final Site Treatment Plan" - completed in March 1995. The FFCA requires the State to approve, approve with modification, or disapprove the Weldon Spring site's final plan after considering public comments and consulting with affected states and the EPA. The State and DOE have signed an Abatement Order on Consent which finalizes the treatment methods and schedules for the mixed waste at Weldon Spring.

The Weldon Spring site's mixed waste inventory is categorized into the following treatability groupings:

- o Aqueous Liquids
- o Inorganic Sludges/Particulates
- o Inorganic Debris/Metal/Batteries
- o Contaminated Debris
- o Reactives/Oxidizers
- o Organic Liquids
- o Organic Sludges
- o Liquid Mercury

The Chemical Plant Record of Decision addresses remedial action of the chemical plant wastes. A major component of this remedy includes on-site treatment of contaminated sludge in a chemical stabilization/solidification (CSS) facility on site. Treated waste will be disposed in an engineered disposal cell facility on site.

A large quantity of the mixed wastes included in the WSS mixed waste inventory are amenable to treatment by the CSS process. Several mixed waste streams are amenable to treatment in the site water treatment plant with pretreatment by a batch process. The remainder of the mixed wastes are either organics requiring thermal destruction or miscellaneous wastes requiring other types of treatment. The following table summarizes the mixed waste treatability groupings and quantities with the proposed treatment option(s):

Water Treatment Plant	Chemical Stabilization/Solidification	Oxidation On-site or Incineration Offsite	Other
Aqueous Liquids (7.5 m ³)	Inorganic Sludges/Particulates (75.2 m ³)	Organic Liquids (57.5 m ³)	Liquid Mercury (Amalgamation) (.4 m ³)
	Inorganic Debris/Metal/Batteries (1840.9 m ³)	Organic Sludges (3.7 m ³)	Reactives/Oxidizers (Deactivation) (20.9 m ³)
	Contaminated Debris (15.2 m ³)		

Most of the waste streams will be treated on-site with the major exception being the organic liquids/organic sludges. The consent order indicates these organic mixed wastes will be treated at the Oak Ridge incinerator. One listed alternative option for these waste streams is to treat them on-site by the Delphi Research, Inc. wet oxidation process called DETOX.

The schedules for waste treatment are based upon current projected funding levels. Treatment of one waste stream is complete and several other treatment activities are underway with most of the rest commencing in 1996. All mixed waste treatment should be complete by the end of the year 2000. Budget reductions have been identified in the consent order as having the potential to impact waste treatment schedules.

Savannah River Site
Proposed Site Treatment Plan
Executive Summary

September 27, 1995

SAVANNAH RIVER SITE MIXED WASTE PROPOSED SITE TREATMENT PLAN EXECUTIVE SUMMARY

INTRODUCTION

The Federal Facility Compliance Act requires the Department of Energy to undertake a national effort to develop Site Treatment Plans for each of its sites generating or storing mixed waste. Mixed waste contains both a hazardous waste subject to the Resource Conservation and Recovery Act and radioactive material subject to the Atomic Energy Act of 1954.

The Site Treatment Plan for the Savannah River Site proposes how SRS will treat mixed waste that is now stored on the site and mixed waste that will be generated in the future. Also, the Site Treatment Plan identifies Savannah River Site mixed wastes that other Department of Energy facilities could treat and mixed waste from other facilities that the Savannah River Site could treat. The Site Treatment Plan has been approved by the State of South Carolina. The Department of Energy will enter into a consent order with the State of South Carolina by October 6, 1995. The consent order will contain enforceable commitments to treat mixed waste.

PAST AND PRESENT MIXED WASTE REGULATIONS

The history of the Federal Facility Compliance Act began with the Resource Conservation and Recovery Act, enacted by Congress in 1976, and amended in 1980 and 1984. The Hazardous and Solid Waste Amendments of 1984 discouraged placing untreated hazardous waste in or on the land, banned long-term storage without treatment for most hazardous waste generated after the effective date of the restrictions, and established treatment standards. The Department of Energy was storing mixed waste, when the 1984 amendments became effective. Consequently, the Savannah River Site negotiated the Land Disposal Restrictions - Federal Facility Compliance Agreement with the Environmental Protection Agency Region IV. The Agreement allowed continuation of storage while the Savannah River Site developed new treatment capabilities. Because the State of South Carolina did not participate in the Land Disposal Restrictions - Federal Facility Compliance Agreement, the Federal Facilities Compliance Act required the Department of Energy and the Savannah River Site to develop a Site Treatment Plan.

Requirements of the Federal Facility Compliance Act

The Resource Conservation and Recovery Act, as amended by the Federal Facility Compliance Act of 1992, requires the Department of Energy to:

- Prepare Site Treatment Plans describing existing treatment capacities and technologies for treating mixed waste; and,
- Provide schedules for developing more treatment capacity and new waste treatment technologies.

Each Site Treatment Plan will be reviewed either by the state where the facility is located, or by the Environmental Protection Agency. The State of South Carolina will review the Site Treatment Plan for the Savannah River Site. The State of South Carolina will also consult with all other states that might be impacted (for example, by treating a mixed waste shipped from the Savannah River Site) by the Site Treatment Plan. The State of South Carolina has the option to:

- Approve the Site Treatment Plan presented by the Department of Energy;
- Approve the Site Treatment Plan with modification; or,
- Disapprove the Site Treatment Plan.

When the State of South Carolina issues a compliance order based on the approved Site Treatment Plan for the Savannah River Site, the Department of Energy will not be subject to fines and penalties for violations of the Land Disposal Restrictions prohibition of storing mixed waste, as long as it remains in compliance with the approved Site Treatment Plan and the compliance order.

DEVELOPMENT OF THE SAVANNAH RIVER SITE TREATMENT PLAN

The Site Treatment Plan for the Savannah River Site was developed in three stages:

1. Conceptual Site Treatment Plan, issued in October 1993;
2. Draft Site Treatment Plan, issued in August 1994; and,
3. Proposed Site Treatment Plan, issued in March 1995.

The Conceptual Site Treatment Plan and the Draft Site Treatment were reviewed by the State of South Carolina, the Environmental Protection Agency, and members of the public. Their comments have been considered in the development of the Proposed Site Treatment Plan.

Conceptual Site Treatment Plan

The Savannah River Site Conceptual Site Treatment Plan described three strategies to treat mixed wastes:

1. Onsite treatment;
2. Offsite treatment at other Department of Energy facilities; and,
3. Vendor treatment either onsite or at the vendor's site.

Draft Site Treatment Plan

The Draft Site Treatment Plan narrowed the treatment strategies identified in the Conceptual Site Treatment Plan to one preferred waste treatment option for each mixed waste stream. Also, the Draft Site Treatment Plan identified those streams for which a treatment option would have to be developed. Treatment at the Savannah River Site of waste streams proposed by other Department of Energy and Department of Defense facilities was addressed, as well.

Proposed Site Treatment Plan

The Proposed Site Treatment Plan identifies schedules for implementation of preferred treatment options for the mixed waste streams. If a preferred option cannot be identified, the Proposed Site Treatment Plan presents a schedule for identifying an option. If technology does not exist to treat the mixed waste, a research program to develop a treatment is proposed. If a waste stream is not sufficiently characterized to select a preferred treatment option, the Proposed Site Treatment Plan offers a schedule for characterizing the waste and developing a treatment plan.

HIGHLIGHTS OF THE PROPOSED SITE TREATMENT PLAN

Selecting the Preferred Waste Treatment Option

The Savannah River Site's method to select a preferred waste treatment option used a three-step approach:

1. Initial screening;
2. In-depth options analysis; and,
3. Engineering assessment.

Initial Screening

Process experts identified waste treatments for the Savannah River Site mixed waste streams during initial screening. Many different treatment methods were considered. The process experts usually screened out treatment methods that were still in the experimental stage. Nevertheless, new and innovative treatment methods are just now coming into existence. These new treatment technologies will be followed closely as they mature. (See **Emerging Technologies.**)

In-Depth Options Analysis

Promising treatment options identified in initial screening were next subjected to a rigorous In-Depth Options Analysis. Process experts defined requirements and used a numerical rating system to make the assessments thorough, consistent, and comparable. Scores were assigned based on how well the waste treatment option satisfied requirements for:

- Environment,
- Health and safety,
- Engineering, and
- Public acceptance.

Project cost was also considered. The numerical score from the in-depth analysis for each waste treatment option was one of the important factors used in the final engineering assessment.

Engineering Assessment

Experienced engineers and scientists chose the preferred option. They applied their expertise and knowledge to the in-depth analysis scores. They made sure the choice of the preferred waste treatment option was considered from many perspectives. Particular attention was paid to waste treatment options with in-depth options analysis scores that ranked close together. These engineers and scientists provided vital input to the selection of preferred options. They added the knowledge and experience that cannot be found in a mathematical model.

Options Analysis Team Waste Treatment Method Selection

The Department of Energy formed an Options Analysis Team composed of DOE experts from across the complex, who are well versed in all the many and complicated facets of mixed waste management. The Options Analysis Team reviewed the Site Treatment Plans for all the sites in the Department of Energy complex. They identified certain treatments that several sites could use together to avoid expensive duplication of facilities. The Options Analysis Team developed a configuration of treatment facilities for the Department of Energy complex that is cost effective, maximizes use of existing facilities, and minimizes the volume of waste transported across state lines.

Mixed Waste Volume and Preferred Treatment Option

Table 1 summarizes the volume of the mixed waste at the Savannah River Site. This volume includes mixed waste now in storage and mixed waste projected to be generated during the next five years.

Table 1 – Savannah River Site Total Mixed Waste Streams

	Low-Level Mixed Waste	Transuranic Mixed Waste	Low-Level Mixed Waste (Managed as transuranic)	High-Level Mixed Waste	Total Onsite Mixed Waste	Proposed Mixed Waste from Naval Reactors Program
Volume (m ³)	12,973.2	5,181.3	3,060.8	142,474	160,630.6	19,711
Volume Percent of Total	8	3	2	87	100	<1 (of onsite waste)

The high-level waste streams listed in Table 1 will be treated at the Defense Waste Processing Facility. The Defense Waste Processing Facility turns the waste into leach-resistant glass. Transuranic mixed waste listed in Table 1 will be characterized, treated, and repackaged to meet the Waste Acceptance Criteria for disposal at the Waste Isolation Pilot Plant in Carlsbad, New Mexico.

Table 2 summarizes the preferred waste treatment options for the Savannah River Site's low-level mixed waste streams and mixed waste from the Department of Defense Naval Reactors program. (See Offsite Waste for information about the Naval Reactors program waste.)

Table 2 – Proposed Site Treatment Plan Preferred Treatment Options for Low-Level Mixed Waste Streams

Facility	Recommended Treatment	Volume (m ³)	Volume Percent
Consolidated Incineration Facility (Existing)	Incinerate and stabilize treatment residuals with cement.	4,516.2	35
M Area Vendor (Proposed)	Fuse into a leach-resistant glass-like material.	2,479.5	19
Savannah River Technology Center (Existing)	Bind the constituents of concern in a leach-resistant resin by ion exchange.	880.8	7
Containment Building - SRS(Proposed)	Macroencapsulate in stainless steel boxes, or with polymer.	1,444.8	11
D Area - SRS (Existing)	Bind the constituents of concern in a leach-resistant resin by ion exchange.	9.6	<1
Effluent Treatment Facility - SRS (Existing)	Bind the constituents of concern in a leach-resistant resin by ion exchange.	0.3	<1
In-Tank Precipitation Facility (Existing)	Wash with acid to remove constituents of concern, which are themselves fused into glass in the Defense Waste Processing Facility.	32.6	<1
Offsite Vendor (Existing)	Remove of the constituents of concern and recycling the decontaminated material.	112.2	1
On-site DOE Mobile Treatment Facility (Proposed)	Thermal oxidation	19.4	<1
Offsite DOE Facilities(Proposed)	Amalgamation, deactivation, and stabilization.	2.8	<1
10-100 nCi/g wastes	To be further characterized	3060.8	24
Treatment to be determined		17.4	2
TOTAL		12,576.4	100%

* Does not include mixed low-level waste meeting treatment standard.

Uncertainties and Areas for Additional Review

Mixed wastes containing transuranic elements need to be characterized. Characterization will tell what waste is to be sent to the Waste Isolation Pilot Plant for final disposal. The equipment and facilities for characterization have to be developed.

Job Control Waste with Enriched Uranium and Solvent Applicators (identified as waste stream SR-W056) has no treatment process currently identified. The waste contains a large amount of uranium. A research program is proposed to find out what treatment options may exist for this waste.

Waste streams containing mercury, identified in Table 2 for treatment in an "offsite DOE facility," are presumed to be treated in the amalgamation facility at Idaho National Engineering Laboratory. Only the conceptual design of this facility has been completed. It is tentatively scheduled to begin construction in the first quarter of 1997.

Tritiated Oil with Mercury (identified as waste stream SR-W036) was selected for treatment by a Department of Energy mobile packed bed reactor. The Savannah River Site will work with the designers to make sure the particular needs for treatment of this waste are met.

Uranium/Chromium Solution (identified as waste stream SR-W031) and Soils from Spill Remediation (identified as waste stream SR-W048) will require identification of a preferred treatment option. Lack of funding prevented treatment by an on-site vendor, as originally planned.

Offsite Waste

Waste generators at other DOE and DOD sites proposed mixed wastes to be treated at Savannah River Site facilities. Technical experts compared the wastes' characteristics to the waste acceptance criteria of specific Savannah River Site treatment facilities. The Savannah River Site has tentatively agreed to treat only 19.7 cubic meters of waste from offsite. This material comes from the Naval Reactors Program. The Consolidated Incineration Facility has the technical ability to treat the Naval Reactors liquid and solid waste streams.

Future Waste Generation

Production operations will contribute little to the future generation of mixed waste at the Savannah River Site. Most future waste generation will come from environmental restoration projects, waste management, and decontamination and decommissioning activities.

Emerging Technologies

The Proposed Site Treatment Plan presents a comprehensive package of preferred treatment options and implementation schedules. Nevertheless, the Department of Energy and the Savannah River Site continue to look for new and emerging technologies. If technologies to treat the mixed waste more safely, more efficiently, or more cost-effectively are discovered, modification of the Site Treatment Plan and compliance order may be requested.

Treatment Schedules

The Proposed Site Treatment Plan contains schedules for DOE's plan for treating the Site's mixed waste. The schedules include construction of new facilities, refurbishment of existing facilities, and contracting with vendors. Changes to these schedules require SCDHEC approval. Each year during the annual budget planning process, DOE-SR will seek funding through the submission of a target budget request and the identification of any additional funding required to accomplish the activities identified for the next two fiscal years. DOE-SR will evaluate schedule activities, not only in the upcoming three fiscal years, but also beyond to identify required funding and possible shortfalls. If DOE finds shortfalls, they will notify SCDHEC and immediately attempt resolution of the shortfall by obtaining additional funds, modifying priorities, or implementing operating efficiencies.

Storage

The Savannah River Site operates several mixed waste storage facilities. Needs for future storage of mixed low-level waste and mixed transuranic waste are being defined by studies in progress.

GLOSSARY

AMALGAMATION	A chemical process in which mercury, a liquid metal, reacts with another material to form a solid. The mercury cannot escape the solid into the environment.
ATOM	The smallest particle into which any material can be cut and still maintain its particular chemical characteristics.
ATOMIC NUMBER	The number of protons an element has in its nucleus. Atomic numbers now go from 1 to 110.
CHARACTERIZATION	Determination of physical, chemical, and radiological components of a waste.
COMPLIANCE ORDER	Legal, binding agreement issued by the State of South Carolina requiring a person, group, or organization to accomplish a specified course of action successfully.
COST EFFECTIVE	The best buy for the taxpayer.
CURIE	Disintegration of 37 billion unstable atomic nuclei in one second, which produces rays or particles.
DECONTAMINATION AND DECOMMISSIONING	The process in which an old facility at the Savannah River Site is safely torn down and the hazardous and radioactive material disposed.
DEFENSE WASTE PROCESSING FACILITY	A waste treatment facility now under construction that will be able to turn high level waste into leach-resistant glass.
DOE COMPLEX	All the locations where DOE has operating and administrative facilities.
EFFLUENT TREATMENT FACILITY	A Savannah River Site waste water treatment facility.
EMERGING TECHNOLOGIES	New methods for waste treatment that are still in the experimental or laboratory stage of development.
ENRICHED URANIUM	Uranium that has more of the isotope U-235 than occurs in nature.
ENVIRONMENTAL PROTECTION AGENCY	Federal Agency tasked with developing regulations to support environmental legislation and enforcing environmental laws and regulations.
HAZARDOUS WASTE	Waste that the Resource Conservation and Recovery Act defines as hazardous.

HIGH-LEVEL MIXED WASTE	Waste produced from reprocessing nuclear reactor fuel elements.
INCINERATION	Breaking the waste into carbon dioxide, water, and small amounts of acid through burning with oxygen.
ION	A atom or combination of atoms that has an electrical charge.
ION EXCHANGE	Replacing one ion (usually an undesirable one) with another ion (usually a desirable one).
ISOTOPE	Any of two or more elements with the same number of protons in the nucleus, but different number of neutrons.
JOB CONTROL WASTE	Discarded materials such as laboratory coats, paper, plastic, and towels used in operations and preventative maintenance activities.
MATHEMATICAL MODEL	A computer program that adds up and summarizes the results of an analysis.
MILESTONES	Enforceable deadlines that can be established for near-term activities, because there is greater fiscal and technical certainty about these activities.
MIXED WASTE	Waste that contains RCRA hazardous and radioactive components.
NANOCURIE (nCi)	One-billionth of a Curie.
NEUTRON	A particle in the nucleus of an atom with no electrical charge.
NUCLEUS	The heavy core of an atom, composed of protons and neutron.
OPTIONS ANALYSIS TEAM	DOE experts from across the complex, who are well versed in all the many and complicated facets of mixed waste management.
PRECIPITATION	A chemical reaction that causes a solid to form in a mixture of liquids.
PROCESS EXPERTS	Scientist and engineers who through training and experience are very familiar with chemical and mechanical methods for treating waste and are knowledgeable about the capabilities of existing facilities and the Savannah River Site.
PROTON	A particle in the nucleus of an atom with a positive electrical charge.

RADIOACTIVE	The property of some unstable elements to emit rays or particles from their nuclei.
RESOURCE CONSERVATION AND RECOVERY ACT (RCRA)	A Federal law that controls management of hazardous waste.
SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL (SCDHEC)	State Agency tasked with developing regulations to support environmental legislation and enforcing environmental laws and regulations in the State of South Carolina.
TRANSURANIC ELEMENTS	Man-made radioactive elements that have an atomic number higher than uranium (92). There are now about eighteen transuranic elements. Plutonium (atomic number 94) is a transuranic element.
TRANSURANIC MIXED WASTE	Waste that contains hazardous materials and transuranic elements.
TREATMENT RESIDUALS	Solid, or liquid materials left over from a waste after it has been treated.
TREATMENT TECHNOLOGY	The chemical or mechanical method of making waste meet environmental regulations.
TRITIATED OIL	Waste lubricating oil that has been contaminated with tritium.
TRITIUM	An isotope of hydrogen with two neutrons in the nucleus. Tritium is radioactive.
VENDOR	A private company in business to sell goods and services to individuals, companies, and the government

EXECUTIVE SUMMARY PROPOSED SITE TREATMENT PLAN (PSTP)

REGULATORY BACKGROUND

On October 6, 1992 the Federal Facilities Compliance Act (FFCA) was enacted as an amendment to the Resource Conservation and Recovery Act (RCRA). The FFCA requires Department of Energy (DOE) facilities that are generating or storing mixed waste to develop plans for treating their mixed waste inventories. Treatment plans can include on-site treatment at the generating facility, off-site treatment at a commercial facility, or off-site treatment at another DOE facility. The purpose of the Plan is to describe the development of treatment capacities and technologies for treating mixed waste.

To meet the Site Treatment Plan (STP) requirement of the FFCA, the DOE developed a three-step approach. First, the WVDP prepared a Conceptual Site Treatment Plan (CSTP) that identified the technology needs, treatment capabilities, and existing plans and options for treating its mixed waste. The WVDP CSTP was submitted to New York State in October 1993 for review. Second, a Draft Site Treatment Plan (DSTP) was prepared which incorporated NYSDEC's comments on the CSTP, provided an analysis of the treatment options identified in the CSTP, and identified the preferred method of treatment for each waste stream. The DSTP was submitted to NYSDEC in August 1994. Third, following modification to address input on the DSTP by New York State Department of Environmental Conservation (NYSDEC) and other stakeholders, this Proposed Site Treatment Plan (PSTP) has been prepared for final review. (The PSTP addresses wastes in inventory at the WVDP through September 1, 1994 and will be updated annually to include wastes which will be generated in the future).

Following approval by NYSDEC, the Plan Volume of the PSTP will be incorporated into a Consent Order.

PSTP STRUCTURE

The PSTP is divided into two volumes: the Background Volume and the Plan Volume. The Background Volume provides a detailed discussion of the preferred option or options, identifies the waste stream(s), and addresses and gives explanatory information for the Plan Volume. The Plan Volume provides specific plans and schedules for treating waste streams.

SUMMARY TABLES

The preferred treatment options that have been identified for the WVDP waste streams are presented in tables ES-1, ES-2, ES-3, and ES-4. For the purpose of providing a summary of the preferred treatment options, the tables have been categorized as on-site treatment (table ES-1), off-site commercial treatment (table ES-2), off-site DOE treatment (table ES-3), and wastes that need further characterization/evaluation (table ES-4). Information on the current volume of waste, treatment type, preferred treatment option, and alternative options are provided in the tables.

If further information is needed you may contact:

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TABLE ES-1

PREFERRED OPTION - ON-SITE TREATMENT*				
TREATABILITY GROUP	VOLUME M ³ 9/1/94	TREATMENT TYPE	PREFERRED OPTIONS	PSTP BACKGROUND/PLAN VOLUME SECTION NUMBER
-Aqueous Liq's, Toxic Metals w/o Merc.	0.0976	Evaporation and Stabilization	IRTS	3.1.4
-Aqueous Liq's, Toxic Organics	0.0218			
-Aqueous Liq's, Ignitable	0.0019			
-Inorganic Sludges, Toxic Metals w/o Mercury	0.0024			
-TRU Elem. Lead, Toxic Metals w/o Mercury	0.0723	Decontamination	CSRF**	4.2.1
-Elem. Lead, Toxic Metals w/o Mercury	1.2608			
-Batteries, Lead-acid, Toxic Metals w/o Mercury	0.0573			
-Uncategorized Metal Debris, Toxic Metals w/o Mercury	0.0001			
-Inorg. Sludges & Particulates, Toxic Metals w/Mercury	30***	Stabilization - HLW	Vit. Facility	5.1.2/5.1
-Aqueous Liq's, Toxic Metals w/o Mercury	45.42***			
-Inorg. Particulates, Toxic Metals w/o Mercury	0.4413	Deactivation and Stabilization	IRTS	3.1.6
-Aqueous Liq's, Ignitable, Corrosive, or Reactive Only	0.596	Aqueous - Neutralization	IWSF	3.1.1
-Org. Liq's, Ignitable, Corrosive, or Reactive Only	0.0018			

* WVDP cannot accept off-site waste for treatment (see Background Volume, section 1.2)

** Pretreatment only - see table ES-2 for treatment options

*** These volumes represent the actual high level waste volumes and do not include fluctuations due to additions of caustic water for "washing and filtering." As of September 1, 1994, the total volume of the caustic solution was 461 m³.

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TABLE ES-2

PREFERRED OPTION - OFF-SITE COMMERCIAL			
TREATABILITY GROUP	VOLUME M ³ 9/1/94	TREATMENT TYPE	PSTP BACKGROUND/PLAN VOLUME SECTION NUMBER
-Org. Liq's, Toxic Org's	0.163	Organic Destruction Non-aqueous	3.1.3
-Org. Liq's, Toxic Org's, and Metals w/o Mercury	4.3916		
-Org. Liq's, Toxic Metals w/Mercury	0.0001		
-Org. Liq's, Ignitable, Corrosive, or Reac.	0.0649		
-Org. Liq's Toxic Metals w/o Mercury	0.0307		
-Org. Liq's, React. Only	0.0004		
-Org. Liq's, Toxic Organics, Ignitable	0.0183		
-Glass Debris, Toxic Metals w/Mercury**	0.0408	Roast/Retort	3.1.5
-Heterogeneous Debris, Toxic Metals w/Mercury**	1.6047		
-Elemental Mercury, Toxic Metals w/Mercury**	0.0004	Amalgamation	3.1.9
-TRU Elem. Lead Toxic Metals w/o Mercury	td*	Macroencapsulation of Lead	3.1.8
-Elem. Lead Toxic Metals w/o Metals	td*		
Uncategorized Metal Debris, Toxic Metals w/o Mercury	0.0001	Reclamation of Non-radioactive Fusible Links	3.1.2
Batteries, Lead-acid, Toxic Metals w/o Metals	0.0573	Reclamation of Non-radioactive Battery	3.1.2

* Lead waste will be decontaminated on site and recycled/reused if possible. Until the lead has been decontaminated, the volume of fixed contaminated lead requiring macroencapsulation is undetermined.

** INEL's WEDF Facility is an alternate option in the event off-site the commercial facility cannot accept DOE waste.

TABLE ES-3

PREFERRED OPTION - OFF-SITE DOE				
TREATABILITY GROUP	VOLUME M ³ 9/1/94	TREATMENT TYPE	PREFERRED OPTION	PSTP BACKGROUND/PLAN VOLUME SECTION NUMBER
-PCB-contaminated Material	1.7155	Org. Destruction	TSCA Incin. ORNL	3.1.7

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TABLE ES-4

NEEDS FURTHER CHARACTERIZATION OR EVALUATION			
WASTE STREAM DESCRIPTION	VOLUME M ³ 09/01/94	PSTP BACKGROUND VOLUME SECTION NUMBER	PSTP PLAN VOLUME SECTION NUMBER
Organic Liquids, Toxic Organics	0.0105	3.3.3	3.3
Aqueous Liquids, Corrosive	0.0881	3.3.1	3.3
Unknown Solid, Toxic Metals w/o Mercury	0.0196	3.3.4	3.3
Solid Process Residues, Toxic Metals w/o Mercury	6.6173	3.3.5	3.3
TRU Solid Process Residues, Toxic Metals w/o Mercury	0.0417	3.3.7	3.3
Aqueous Liquids, Toxic Organics	0.0318	3.3.2	3.3
Unknown, Toxic Metals w/o Mercury	0.0260	3.3.6	3.3
Predominantly Combustible Debris	.0674	3.3.8	3.3
Uncategorized Heterogeneous Debris, Toxic Metals w/Mercury	66.81	3.3.9	3.3
Organic Sludges, Toxic Metals w/o Mercury, Ignitable, Corrosive, or Reactive Only	0.0652	3.3.10	3.3

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