DOE/NTP-96-1204
Revision 3

National TRU Waste Management Plan

Corporate Board Annual Report

U.S. Department of Energy
Carlsbad Field Office

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Carlsbad, New Mexico

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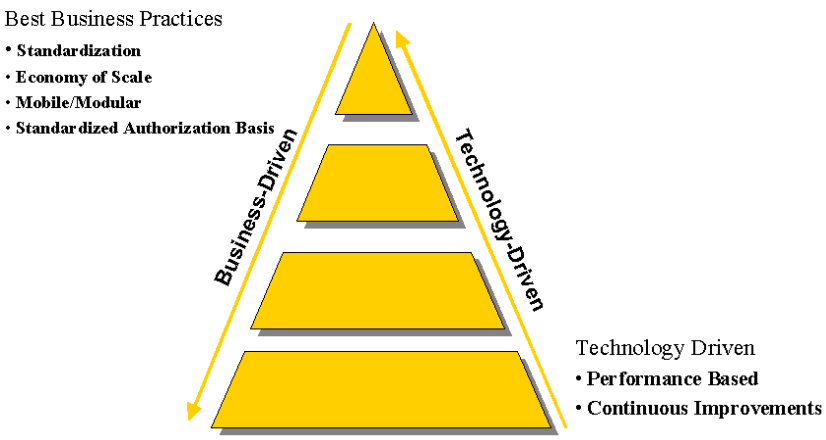
ACRONYMS AND ABBREVIATIONS

AEC	Atomic Energy Commission
ACL	Analytical Chemistry Laboratory (INEEL)
Am-241	americium-241
AMWTF	Advanced Mixed Waste Treatment Facility
ANL-E	Argonne National Laboratory-East, Argonne, IL
ANL-W	Argonne National Laboratory-West, Idaho Falls, ID
ARCO	ARCO Medical Products Company, West Chester, PA
B&W-NES	Babcock & Wilcox – Nuclear Engineering Services, Lynchburg, VA
BAPL	Bettis Atomic Power Laboratory, West Mifflin, PA
BCL	Battelle Columbus Laboratories, Columbus, OH
CAO	U.S. Department of Energy Carlsbad Area Office (now the Carlsbad Field Office)
CABE	Center for Acquisition and Business Excellence
CBFO	U.S. Department of Energy Carlsbad Field Office
CCA	WIPP Compliance Certification Application
CCF	central confirmation facility
CCP	Centralized Characterization Project
CEMRC	Carlsbad Environmental Monitoring & Research Center (New Mexico State University)
CFR	*Code of Federal Regulations*
CH	contact-handled
CID	Central Internet Database
CNS	Chem-Nuclear Systems (now Duratek, Inc.)
CRA	Compliance Recertification Application
DOE	U.S. Department of Energy
DOE/EM	U.S. Department of Energy/Environmental Management
DOE-HQ	U.S. Department of Energy – Headquarters
DOT	U.S. Department of Transportation
DR/CT	Digital radiography/computed tomography
ECL	Environmental Chemistry Laboratory (INEEL)
EEG	Environmental Evaluation Group
EPA	U.S. Environmental Protection Agency
ETEC	Energy Technology Engineering Center, Santa Susana, CA
FR	*Federal Register*
FY	fiscal year

GE-VNC	General Electric – Vallecitos Nuclear Center, Pleasanton, CA
GFS/I	Government Furnished Services/Items
Hanford	Hanford Reservation, Richland, WA
HLW	high-level waste
HWFP	WIPP Hazardous Waste Facility Permit
ICV	Inner Containment Vessel
INEEL	Idaho National Engineering and Environmental Laboratory, Idaho Falls, ID
IPABS	Integrated Planning, Accountability, and Budgeting System
KAPL	Knolls Atomic Power Laboratory, Niskayuna, NY
KAPL-NFS	Knolls Atomic Power Laboratory-Nuclear Fuel Services, Inc., Erwin, TN
LANL	Los Alamos National Laboratory, Los Alamos, NM
LBNL	Lawrence Berkeley National Laboratory, Berkeley, CA
LLNL	Lawrence Livermore National Laboratory, Livermore, CA
LLW	low-level waste
LRRI	Lovelace Respiratory Research Institute, Albuquerque, NM
LWA	WIPP Land Withdrawal Act
m^3	cubic meters
MEMP	Miamisburg Environmental Management Project (Mound), Miamisburg, OH
MOC	Management and Operating Contractor
MURR	Missouri (University of) Research Reactor, Columbia, MO
NCT	National Certification Team
NMED	New Mexico Environment Department
NRC	Nuclear Regulatory Commission
NTP Office	Office of National TRU Program, Carlsbad Field Office
NTS	Nevada Test Site, Mercury, NV
ORNL	Oak Ridge National Laboratory, Oak Ridge, TN
PGDP	Paducah Gaseous Diffusion Plant, Paducah, KY
ppm	parts per million
Pu-239	plutonium-239
QA	Quality Assurance
RCRA	Resource Conservation and Recovery Act

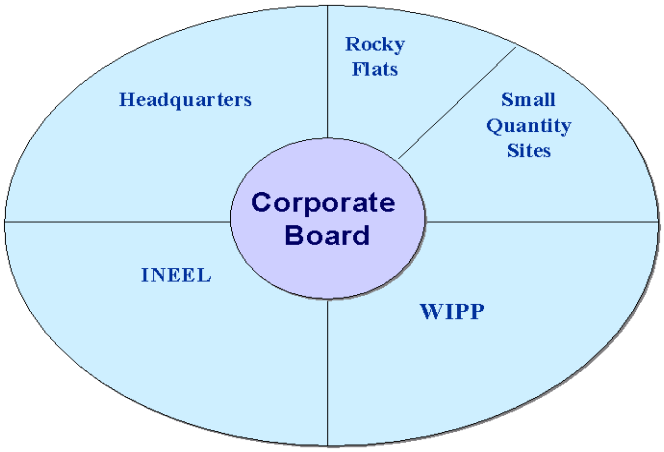
RFETS	Rocky Flats Environmental Technology Site, Golden, CO
RH	remote-handled (waste)
RTF	Remote Treatment Facility
SARP	Safety Analysis Report for Packaging (for the TRUPACT-II Shipping Package)
SCDHEC	South Carolina Department of Health and Environmental Control
SEIS	Supplemental Environmental Impact Statement
SNL-NM	Sandia National Laboratories, Albuquerque, NM
SPRU	Separations Process Research Unit, Schenectady, NY
SRS	Savannah River Site, Aiken, SC
SWB	standard waste box
TDOP	ten-drum overpack
TRAMPAC	TRUPACT-II authorized methods for payload control
TRU	transuranic
TRUPACT-II	Transuranic Package Transporter, Model II
TSCA	Toxic Substances Control Act
TSD	treatment, storage, and disposal (facility)
TWBIR	TRU Waste Baseline Inventory Report
TWRF	TRU Waste Remediation Facility
USAMC	U.S. Army Material Command, Rock Island, IL
WAC	Waste Acceptance Criteria
WAP	Waste Analysis Plan
WIPP	Waste Isolation Pilot Plant, Carlsbad, NM
WRAP	Waste Receiving and Processing (Facility)
WVDP	West Valley Demonstration Project, West Valley, NY

Annual Report
National Transuranic Waste Corporate Board



In May 2001, the DOE held the first meeting of the National Transuranic Waste Complex Corporate Board. Based on a commercial business model, the board was organized to manage the transuranic waste complex as a single corporate business entity rather than as a number of independently managed operations. The Board is the principal DOE means to integrate the independently managed DOE sites within the national TRU waste system into a single, unified entity. The purpose of the Board is to institute, through consensus, best business practices for economy of scale, standardization, and the appropriate use of mobile/modular systems to minimize costs, optimize transportation logistics, and implement new policies or requirements.

Membership consists of senior DOE and contractor representatives from those sites that are actively shipping waste to the WIPP. These members include:



Department of Energy
Chief Executive Officer, Carlsbad Field Office
Chief Operating Officer, Carlsbad Field Office
DOE-Headquarters, WIPP Office
DOE-OH, Small Quantity Sites
DOE-ID, Idaho National Engineering and Environmental Laboratory
DOE-RF, Rocky Flats Environmental Technology Site

Contractor Representatives
Westinghouse TRU Solutions, WIPP Management and Operating Contractor
INEEL Advanced Mixed Waste Treatment Facility
INEEL 3100 m^3 Project
Kaiser-Hill

Technical Advisors
DOE-AL, Los Alamos National Laboratory (added February 2002)
DOE-OR, Oak Ridge National Laboratory
DOE-RL, Hanford Reservation (added February 2002)
DOE-SR, Savannah River Site
Westinghouse TRU Solutions
Los Alamos National Laboratory

During its first months, the board considered many issues including: site shipping schedules; implementation of efforts to optimize characterization, transportation, and disposal activities; strategies to implement standard procedures and equipment; implementation of the National Academy of Sciences Final Report on Improving WIPP Operations; and strategies to assist facilities across the country that only have small quantities of waste that will come to WIPP (small quantity sites [SQS]).

In February 2002, the DOE issued a review of ongoing activities and practices at the DOE sites for which they were responsible for cleanup. This document, the *Top-to-Bottom Review of the EM Program*, identified four primary findings to better address cleanup activities and recommended improvements to the process. These findings included:

- The manner in which EM develops, solicits, selects, and manages many contracts is not focused on accelerating risk reduction and applying innovative approaches to doing the work,
- EM's cleanup strategy is not based on comprehensive, coherent, technically supported risk prioritization,
- EM's internal business processes are not structured to support accelerated risk reduction or to address its current challenge of uncontrolled cost and schedule growth, and
- The current scope of the EM program includes activities that are not focused on or supportive of an accelerated, risk-based cleanup and closure mission.

These findings have been embraced in the development of this National TRU Waste Management Plan and are reflected in the schedules and planned initiatives described throughout the Plan for accelerating the cleanup and closure of DOE facilities.

In addition to addressing the EM Top-to-Bottom review, the current revision of the National TRU Waste Management Plan meets the need for a DOE systemwide program plan and also serves as the Board's Annual Report. The Board shares the mission, vision, goals, and objectives established by the program plan.

Vision

Each site with a current or future inventory of TRU waste reaches its desired end state. At sites scheduled for cleanup and closure, the desired end state is the removal of all TRU waste from temporary storage for permanent disposal at an approved facility. At sites with ongoing missions, the desired end state is not only removal of TRU waste from temporary storage but also planned removal of newly generated waste.

Mission

To implement a DOE TRU waste system that will safely and cost-effectively achieve the desired end state at each site.

Goals

Specific objectives to support each goal are delineated in Section 2, DOE National TRU Program.

Goal 1: Maintain compliance with environmental, safety, and other regulatory requirements, agreements, and orders.

Goal 2: Operate an integrated system to dispose of the DOE's TRU waste.

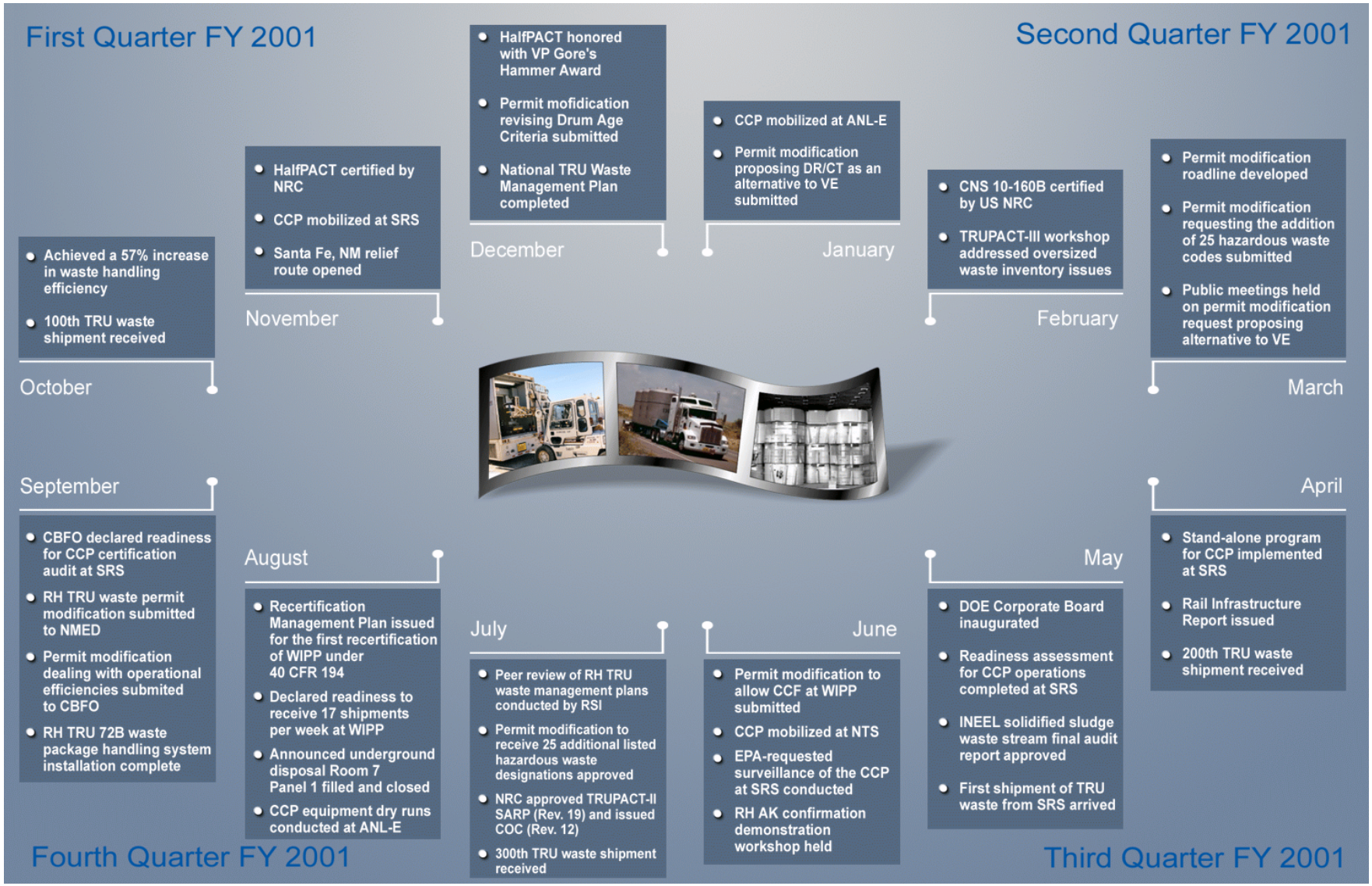
Goal 3: Optimize TRU waste system operations.

The Board reports that during FY 2001 the ramp up of TRU waste shipments toward the objective of 17 shipments per week continued. Accomplishments that support the ramp up are shown in Figure ES-1, National TRU Program FY 2001 Accomplishments. TRU waste sites averaged over six shipments per week during FY 2001, compared to an average of about one shipment per week during FY 2000. During FY 2002, the site shipment demand is expected to exceed transportation capabilities with current projections showing an average demand of over 25 shipments per week. Maximum shipment demand is forecast to occur near the end of FY 2002 with a site demand for over 34 shipments per week. Additional funding was requested and has been received

to reach 25 shipments per week. It is anticipated that the funding to reach both a shipping level of 30 shipments per week as well as the associated increase in waste handling capability will be received during FY 2002.

When compared to FY 2001 key performance indicators (KPIs) established in Revision 2 of the plan (December 2000), the TRU waste system realized 75 percent of its shipment goal and 69 percent of its shipment volume goal. These are presented in Chapter 3 of this report. The less than anticipated values are due to: the lack of characterized and certified TRU waste inventory for shipment; limitations in the number of containers and TRUPACT-IIs per shipment due to container weight restrictions (e.g., two TRUPACTs per shipment instead of three due to weight restrictions); delays in the approval of site certification audit documentation; certification process errors and the need for the additional Environmental Protection Agency (EPA) inspection; site mechanical difficulties; weather delays; and the cessation of shipments due to the September 11, 2001, terrorist attacks. Proposed actions to address those activities that limited waste receipts are addressed in Chapter 5.0.

Figure ES-1 - National TRU Program FY 2001 Accomplishments



Chapter 1.0

Introduction

1.0 INTRODUCTION

Chapter Highlights - This chapter was modified to reflect changes in the current Department of Energy organization and the creation of the National Transuranic Waste Complex Corporate Board. Other changes included updates to the current disposed volume inventories and a general update to the stored, projected, and to-be-disposed TRU waste volumes.

The U.S. Department of Energy (DOE) is committed to honoring the federal government's obligation to clean up "legacy" waste at sites across the nation that supported the production and testing of nuclear weapons and other defense activities. The objective of DOE Order 435.1, "Radioactive Waste Management," is to ensure that all DOE radioactive waste is managed in a manner that is protective of worker and public health and safety, and the environment. The Assistant Secretary for Environmental Management (EM-1) is responsible for establishing and maintaining integrated complexwide radioactive waste management programs. The Deputy Assistant Secretary for Integration and Disposition (EM-20) is responsible for developing, implementing, and maintaining integrated complex-wide radioactive waste management program plans. Each plan describes, at the DOE complexwide level, the functional elements, organizations, responsibilities, and activities that comprise the system needed to store, treat, and dispose of waste. In addition, the Deputy Assistant Secretary is responsible for establishing and maintaining a system to compile waste generation projection data and other information concerning waste management facilities, operations, and activities. Issuing the National Transuranic (TRU) Waste Management Plan, Revision 2, fulfilled the obligation of the Deputy Assistant Secretary to develop a systemwide program plan for TRU waste. Revision 3 updates data presented in Revision 2, provides the status of ongoing programs and activities, and continues to meet the need for a systemwide program plan.

The DOE created the Carlsbad Field Office (CBFO) Office of National TRU Program (NTP Office) to serve as the focal point and lead the nation's TRU waste management efforts. One of the CBFO's major milestones achieved toward the goal of national cleanup was the Waste Isolation Pilot Plant (WIPP) becoming operational in March of 1999.

Transuranic waste consists of clothing, tools, rags, debris, and other such items contaminated with small amounts of radioactive elements - mostly plutonium. These elements are radioactive, and man-made, and have an atomic number greater than ("trans") uranium.

Located in southeastern New Mexico, WIPP is designed for the safe, permanent disposal of transuranic radioactive waste left from the production of nuclear weapons and other defense activities. Project facilities include excavated rooms 2,150 feet underground in an ancient, stable salt formation.

As of December 31, 2001, WIPP has received 493 transuranic waste shipments

Site	*Shipments*	*Volume (m^3)*
INEEL	*170*	*1,018.5*
LANL	*25*	*271.0*
RFETS	*281*	*1,740.5*
Hanford	*10*	*80.4*
SRS	*7*	*61.7*
Totals	*493*	*3,172.1*

Early in 2001, the DOE organized the National Transuranic Waste Complex Corporate Board (the Board). The Board was developed to provide consensus, strategic, tactical, and programmatic recommendations, and facilitate the integration and business-like operation of the National TRU Waste Program. The Board will incorporate the use of best management business practices, such as standardization, economies of scale at the national level, operational efficiencies (e.g., modular/mobile systems), and establish national authorization basis requirements for the operational safety of the modular/mobile systems (i.e., documentation transferable from site to site). The Board meets on a routine basis to status activities and develop recommendations, and review past performance and redirect future plans. The constituency of the Board and its responsibilities are described further in Section 1.3.4.

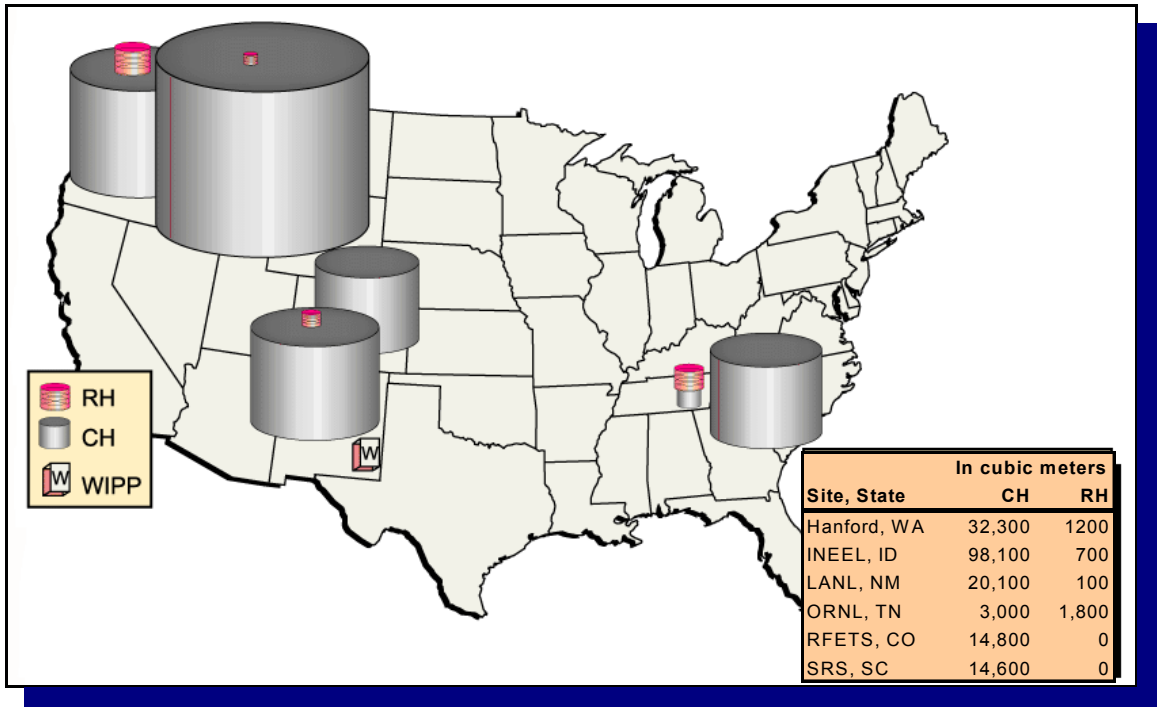
The National TRU Waste Management Plan (the Plan) addresses the management and disposal of TRU waste to clean up, and, when possible, close sites under the DOE's control. The Plan should be viewed as part of an ongoing process that will continue to evolve in response to stakeholder comments, programmatic decisions, changing circumstances, and future budgets. Therefore, this annual revision updates information presented in the previous version and provides details in the following areas:

- The vision, mission, goals, and objectives of the National TRU Program;
- The status of TRU waste management activities throughout the DOE TRU waste system, including cost projections;
- The path forward for disposition of the nation's TRU waste; and
- The performance indicators used to monitor progress with respect to established schedules.

1.1 Generation of Transuranic Waste

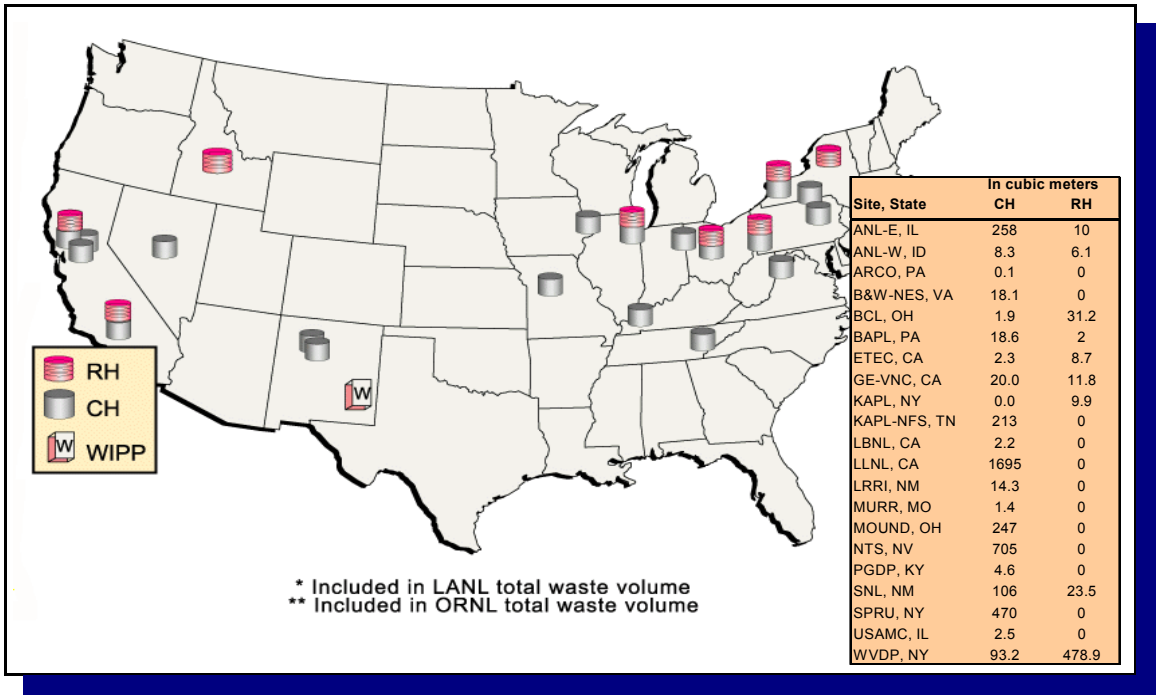
TRU waste generation began with the manufacture of nuclear weapons in the 1940s. Research and development efforts at laboratories around the country, as well as weapons production, account for the majority of TRU waste in today's inventory. Additional waste will be generated as many DOE sites make the transition from nuclear weapons production to environmental restoration and decommissioning.

The use of the term "transuranic" as a type of waste is relatively new. Prior to 1970, the DOE disposed of waste as it was generated, typically on the site at which the waste was generated. Since 1970, with a change in regulatory framework, the waste classified as TRU has had different disposal requirements and caused the DOE to seek alternative methods for disposal. Figures 1.1-1 and 1.1-2 show the location and relative quantities of TRU waste in the DOE TRU waste system. Additional TRU waste sites, specifically additional small quantity sites, are anticipated to be identified in the future.



Site, State	In cubic meters CH	RH
Hanford, WA	32,300	1200
INEEL, ID	98,100	700
LANL, NM	20,100	100
ORNL, TN	3,000	1,800
RFETS, CO	14,800	0
SRS, SC	14,600	0

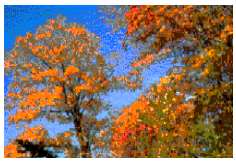
Figure 1.1-1 - Location and Relative Quantities of TRU Waste (Large Quantity Sites). Six sites manage 97 percent of the stored and projected volumes of TRU waste.



Site, State	In cubic meters CH	RH
ANL-E, IL	258	10
ANL-W, ID	8.3	6.1
ARCO, PA	0.1	0
B&W-NES, VA	18.1	0
BCL, OH	1.9	31.2
BAPL, PA	18.6	2
ETEC, CA	2.3	8.7
GE-VNC, CA	20.0	11.8
KAPL, NY	0.0	9.9
KAPL-NFS, TN	213	0
LBNL, CA	2.2	0
LLNL, CA	1695	0
LRRI, NM	14.3	0
MURR, MO	1.4	0
MOUND, OH	247	0
NTS, NV	705	0
PGDP, KY	4.6	0
SNL, NM	106	23.5
SPRU, NY	470	0
USAMC, IL	2.5	0
WVDP, NY	93.2	478.9

Figure 1.1-2 - Location and Relative Quantities of TRU Waste (Small Quantity Sites). Twenty-one sites manage 3 percent of the stored and projected volumes of TRU waste.

1.2 Protecting the Public and the Environment



Eliminating risk from TRU waste requires isolating it from the public and the environment.

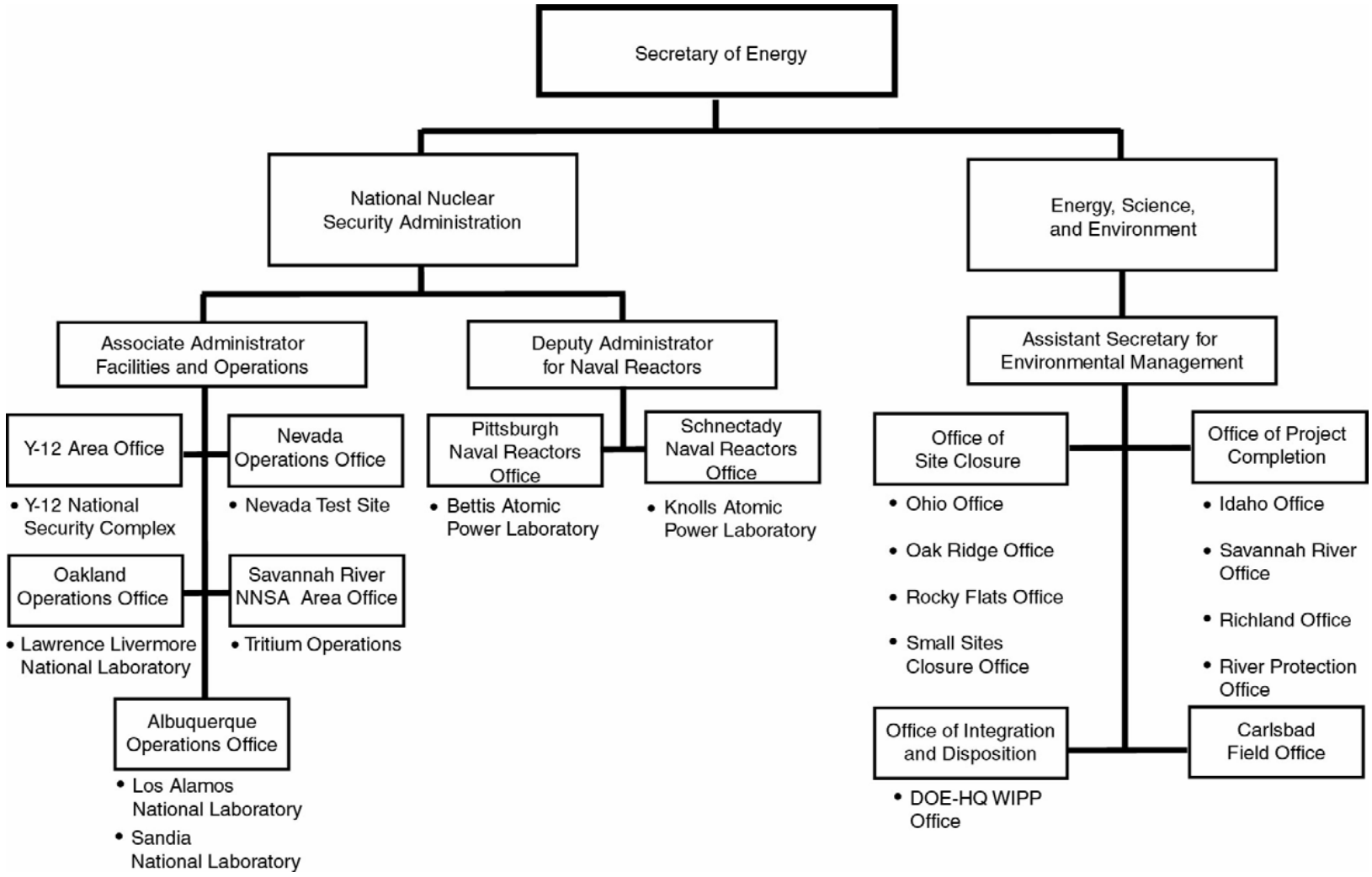
The DOE inherited the mission to create and maintain the U.S. nuclear arsenal in 1977 from the Energy Research and Development Administration. Of primary importance to this mission is the DOE's responsibility to reduce risk to workers, the public, and the environment posed by long-term temporary storage of TRU waste. The concept of risk to the public is a result of the probability of how often accidents can occur and the consequence of contaminant release. While accidents are unlikely to occur, the risk associated with a potential release of contamination has to be addressed by those in positions of responsibility in the DOE. Eliminating the hazard also eliminates risk and, in the case of waste contaminated with long-lived radioactive elements, involves permanently disposing of the waste in facilities isolated from public access and the environment.

To further reduce risk, the DOE recently implemented contract and management reform initiatives to provide incentives for safe and early cleanup and, where appropriate, closure of TRU waste sites. The DOE and the management and integrating contractor at RFETS, for example, signed a cost plus incentive fee contract to safely close the site as early as December 15, 2006. An added benefit to accelerated cleanup and closure is an anticipated reduction of costs associated with continued long-term management of TRU waste.

1.3 Organizations and Responsibilities

Figure 1.3-1 shows the DOE organizations responsible for managing TRU waste. This chart is a composite of sections of various DOE organization charts. Both the National Nuclear Security Administration and the Office of Energy, Science, and Environment have these responsibilities. As noted in DOE M 435.1-1, Radioactive Waste Management Manual, the document for implementing DOE Order 435.1, the Deputy Assistant Secretary for Integration and Disposition is responsible for developing, implementing, and maintaining an integrated complexwide program plan for TRU waste. A summary of roles and responsibilities for implementing an integrated program strategy is discussed in the following paragraphs. Organizations key to the successful implementation of the integrated program strategy include the Office of Integration and Disposition, the CBFO, DOE operations offices, and TRU waste sites.

Figure 1.3-1 - DOE Organizations with Responsibility for TRU Waste Management



1.3.1 Office of Integration and Disposition

The Office of Environmental Management's (DOE-EM) Office of Integration and Disposition (EM-20) is responsible for promoting, enabling and expediting site closure and project completion. Reporting to this Office is the Headquarters WIPP Office (EM-23). DOE-EM provides guidance to facilitate the coordinated, timely, safe, and cost-effective disposition of nuclear materials and waste. Key functions of the EM-20 Office are to:

- Develop Headquarters policy, program guidance, and direction to achieve an effective, efficient, technically sound, safe, and environmentally acceptable waste treatment, storage and disposal system. This office also approves technical, cost and schedule baselines, and reviews and approves major changes as appropriate;

- Promote integration and coordination of TRU waste processing or treatment, storage, transportation, and disposal activities with the TRU waste sites;

- Develop strategies, options, analyses, and recommendations in support of policy development, long-range planning and cost effectiveness; and

- Formulate waste management budget requirements and allocations, as well as associated justification, documentation, and testimony for the program. This also includes reviews of site requests and development of independent recommendations of waste management resource requirements and funding levels based on site and national policies and plans.

1.3.2 Carlsbad Field Office

The mission of the CBFO is to protect human health and the environment by safely disposing of defense-related TRU waste at WIPP and by establishing an effective system of management of TRU waste from generation to disposal. The CBFO develops and directs implementation of the National TRU Programs, assesses compliance with the program guidance, and ensures the commonality of activities and assumptions among all TRU waste sites. The CBFO reports to the Assistant Secretary for Environmental Management, EM-1.

The CBFO Office of the National TRU Program is responsible for development and management of a comprehensive waste management strategy. The Office of the National TRU Program:

- Works with DOE operations offices to coordinate and integrate the various program elements (TRU waste inventory, waste characterization, TRU waste characterization process certification, transportation, WIPP disposal and system integration) carried out across the DOE TRU waste system;

- Assesses efficiency and effectiveness of TRU waste systems operations;

- Develops guidance for long-term storage and disposal options for all TRU waste (defense and nondefense) and for the development of TRU waste treatment technologies to ensure compatibility and compliance with applicable requirements;

- Evaluates the impact of policies and criteria on the TRU waste sites' operations and institutional programs and develops and implements plans, policies, and guidance documents so that programmatic efforts comply in a timely and cost-effective manner;

- Provides technical guidance to develop and implement TRU waste characterization programs and information systems to support requirements that govern the collection of TRU waste characterization data; and

- Manages TRU waste transportation system and shipping corridors; provides training programs for interested state, tribal, and local emergency responders.

1.3.3 DOE Operations Offices/TRU Waste Sites

TRU waste sites are responsible for integrating elements of the program strategy into their planning and budget requests to support TRU waste disposal. The DOE Operations Offices and sites also assure that TRU waste characterization and certification activities are in accordance with transportation and disposal requirements, and that these programs remain in compliance. In addition, the DOE Operations Offices and sites are responsible for ensuring that the schedules contained in the Plan are consistent with the specific details of state compliance orders and regulatory agreements.

1.3.4 National Transuranic Waste Complex Corporate Board

Early in 2001, the DOE organized the National Transuranic Waste Complex Corporate Board (the Board). The Board was developed to provide consensus, strategic, tactical, and programmatic recommendations, and facilitate the integration and business-like operation of the National TRU Waste Program. Membership consists of senior DOE and contractor representatives from those sites that are actively shipping waste to the WIPP. Current membership in the Board includes:

- The CBFO Manager as the Chief Executive Officer,

- The CBFO Assistant Manager for National TRU Program as the Chief Operating Officer,

- The DOE Headquarters WIPP Program Office Director,

- A Senior DOE-ID Manager,

- A Senior Contractor Representative from the INEEL 3100 m^3 Project,
- A Senior Contractor Representative for the INEEL Advanced Mixed Waste Treatment Facility Project,
- A Senior DOE-RFFO Manager,
- A Senior Contractor Representative from RFETS,
- A small quantity site Senior DOE representative, and
- The WIPP M&O contractor small quantity site manager.

In addition to Board members, advisors are also added to the Board as needed. These advisors are either Technical Advisors or other Site TRU Waste Project Managers. They provide both technical and logistical support to the Board and the National TRU Waste Program. The current Technical Advisors to the Board are:

- The DOE-AL, Los Alamos National Laboratory; representative,
- The DOE TRU Waste Manager from Oak Ridge,
- The DOE TRU Waste Manager from the Hanford Reservation,
- The DOE TRU Waste Manager from the Savannah River Site,
- A representative from Westinghouse TRU Solutions, LLC, and
- A representative from the Los Alamos National Laboratory.

The representatives from DOE-AL and from the Hanford Reservation were recently added in February 2002 to supplement the existing membership of the Board.

The responsibilities of the Board members are multifaceted in that they:

- Provide solutions, ideas, and suggestions to issues that affect the vision, mission and goals of the National TRU Waste program,
- Participate in Board activities and regularly attend Board meetings,
- Assist the CEO to implement and prioritize business initiatives,
- Establish the priority for the limited National TRU Waste Program resources (e.g. shipping packages, Mobile Vendors, etc.),
- Seek specific generator storage site and overall TRU complex operating efficiencies, in order to develop recommendations for standardization, modular/mobile initiatives, and economies of scale,

- Monitor, review, and recommend appropriate performance metrics that arise from changes to the integrated schedule, and

- Champion and communicate the Board recommendations at their individual sites.

The overall vision of the Board is to achieve an end-state of cost effectiveness and safety by using best management business practices, such as standardization, economies of scale at the national level, operational efficiencies (e.g., modular/mobile systems), and by establishing national authorization basis requirements for the operational safety of the modular/mobile systems (i.e., documentation transferable from site to site). The near-term vision is to safely process 17 contact handled (CH) shipments at WIPP each week, at a characterization cost of less than $3,000 per container. For RH waste the vision is to operate at the RH design throughput at a characterization cost of $5,000 per container. Recent funding increases will allow the transport and receipt of 25 shipments per week, but will not impact these cost figures.

The Board meets on a routine basis to status activities and develop recommendations, and review past performance and redirect future plans.

1.4 Implementation

The CBFO has involved other DOE sites, contractors, the scientific community, and other stakeholders to develop strategic and operational plans for management of TRU waste. The basis for development of the Plan is a thorough understanding of:

- The Federal and state regulatory framework governing DOE operations,

- Commitments made by the DOE to Federal, state, and tribal governments,

- Technology needs to enable sites to repackage, treat, characterize, transport, and dispose of waste,

- Existing DOE infrastructure, and

- Budgetary constraints.

The Plan couples this understanding with good management practices to manage the TRU waste system in a business-like approach. It integrates site-specific waste management planning with requirements for treatment, characterization, transportation, and disposal and provides operational plans against which budget needs can be developed. The Plan also provides a vision for the end-state of the DOE TRU waste system responsible for managing TRU waste and discusses the needs and path to achieve that state. Finally, it provides accountability to DOE management and the public by providing a means to monitor performance against schedule.

One of the tools used by DOE to integrate this Program is a centralized database that DOE TRU waste system participants use to report programmatic plans and budget requests. The database, called the Integrated Planning, Accountability, and Budgeting System (IPABS), is used to compile schedules, volumes of waste in the inventory, and budget needs of the individual sites. Using the IPABS data input from the sites to develop revised projections, the Plan provides consistent planning assumptions and is one of the key changes incorporated into this revision. The IPABS was selected because it is the tool being used by DOE to perform both strategic and programmatic National TRU planning. The values found in the Plan differ slightly from the current version of the IPABS database as well as other databases used by the DOE to track and manage waste inventory information. These differences exist because of differences in the basic applications of the collected data, differences in the data collection periods, and the provision of more current data by the sites during preparation of this revision of the National TRU Waste Management Plan. The Management and Operating Contractor (MOC) for WIPP coordinates with the TRU waste sites and the IPABS coordinators to assure that data used in the NTWMP is consistent and current with that available in the IPABS and other informational databases.

The Plan contains operational plans using an update to the baseline information regarding TRU waste disposition for the DOE TRU waste system. In addition to this introductory chapter, the Plan contains:

- Chapter 2.0 -- Vision, mission, goals, and objectives; integrated program strategy and implementation; issues as identified by stakeholders and key personnel; waste projections; and life-cycle waste planning

- Chapter 3.0 -- Baseline, including shipping/disposal schedules; management of WIPP-acceptable waste; and performance metrics

- Chapter 4.0 -- Baseline cost estimates

- Chapter 5.0 -- Path forward for the DOE TRU waste system

- Appendix 1 -- Site-specific planning summaries

The TRU Waste System Optimization Plan will be published shortly and will be a companion to the National TRU Waste Management Plan and will contain a plan to reach the DOE's vision of the end-state of the TRU waste system. The Optimization Plan will contain:

- An introduction to the TRU optimization effort and decision modeling;
- A prioritized list of issues/needs;
- Research and development plans and schedules;
- Roadlines (a combination roadmap and timeline);
- A synopsis of each recommendation with a detailed analysis of each issue or need. The analyses will include options, cost-benefit analyses, prioritization, contingency planning, and recommendations; and
- Cost and anticipated savings as a result of the TRU system optimization effort.

Chapter 2.0

DOE
National TRU Program

2.0 DOE NATIONAL TRU PROGRAM

Chapter Highlights - This chapter was modified to reflect the current status of technical and programmatic issues identified in Revision 2 and any new issues raised in the past year. Since Revision 2 of the Plan, efforts on many of the identified technical and programmatic issues have progressed significantly. The brief summaries in Section 2.3 have therefore been revised to reflect these efforts. In some cases, if the original issue has been addressed, then the section has been deleted. For example, in the case of asbestos disposal, this section has been deleted from this chapter since asbestos disposal is now allowed at WIPP.

This chapter presents the vision, mission, goals, and objectives of the DOE National TRU Program. The concept of an integrated program strategy to optimize the TRU waste system is presented. Technical and programmatic issues that impact the successful integration of the system are discussed.

2.1 Vision and Mission

The *vision* of the National TRU Program (the Program) is that each site with current or future inventory of TRU waste reaches its desired end state. At sites scheduled for cleanup and closure, the desired end state is the removal of all TRU waste from temporary storage for permanent disposal at an approved facility. At sites with ongoing missions, the desired end state is not only removal of TRU waste from temporary storage but also planned removal of newly generated waste.

The *mission* of the Program is to implement a DOE TRU waste system that will safely and cost-effectively achieve the desired end state at each site.

End State

A site is considered "complete" (or at its "end state") when . .

. . . deactivation or decommissioning of all facilities currently in the cleanup program have been completed, excluding any long-term surveillance and monitoring;

. . . all releases to the environment have been cleaned up in accordance with agreed-upon cleanup standards;

. . . groundwater contamination has been contained, or long-term treatment or monitoring is in place;

. . . "legacy" waste (waste produced by past nuclear production activities, except high-level waste) has been disposed of in an approved manner;

. . . waste is continuously removed and disposed of from sites with ongoing missions.

2.2 Goals and Objectives

The DOE has established and prioritized the following goals and objectives to achieve the Program mission:

Goal 1: Maintain compliance with environmental, safety, and other regulatory requirements, agreements, and orders.

Objectives:

1. Comply with Federal and state environment, safety and health regulations and orders. *(Responsibility: All Program participants)*

2. Operate within the bounds of applicable Federal and state permits, rules, and orders. *(Responsibility: All Program participants)*

3. Comply with agreements made between the DOE and Federal, state, and tribal agencies. *(Responsibility: All Program participants)*

Goal 2: Operate an integrated system to dispose of the DOE's TRU waste.

Objectives - Inventory:

1. Maintain an accurate inventory of TRU waste forms and quantities. *(Responsibility: TRU waste sites. Note CBFO responsibility for data compilation.)*

2. Identify alternatives for TRU waste that has an associated need that must be fulfilled prior to disposal or has no current plan for disposal. *(Responsibility: All Program participants.)*

Objectives - Treatment, Characterization, Transportation and Disposal:

1. Characterize waste in accordance with disposal facilities' waste analysis plans and waste acceptance criteria (WAC). *(Responsibility: TRU waste sites)*

2. Maintain transportation and disposal capability to meet or exceed waste shipper demand. *(Responsibility: CBFO)*

3. Modify the WIPP Hazardous Waste Facility Permit (HWFP) to dispose of RH TRU waste. *(Responsibility: CBFO)*

4. Make efficient use of treatment, characterization, transportation and disposal resources to maximize system capability. *(Responsibility for treatment and characterization: TRU waste sites. Responsibility for transportation and disposal: CBFO)*

5. Manage the TRU waste system by integrating waste shipper demand with transportation and disposal capability. *(Responsibility: CBFO)*

Goal 3: Optimize TRU waste system operations.

Objectives:

1. Eliminate waste characterization requirements for disposal at WIPP which lack a technically derived legal or safety basis, and which are not supported by the Performance Assessment of the repository. *(Responsibility: CBFO)*

2. Minimize waste generator characterization requirements at small quantity sites by a central confirmation facility at WIPP. *(Responsibility: CBFO)*

3. Identify and evaluate alternatives to current treatment, characterization, transportation, waste minimization and disposal methods and issues (e.g., centralized disposal characterization at WIPP). Develop and implement a plan to optimize the TRU waste system by increasing operational efficiency, seeking regulatory change, implementing technology, and implementing a research development and deployment program. *(Responsibility: EM-20 and CBFO)*

4. Evaluate options for TRU waste not currently acceptable at WIPP. *(Responsibility: EM-20 working with all program participants)*

2.3 Integrated Program Strategy

The DOE *Status Report on Paths to Closure* (DOE/EM-0526, March 2000) states that an estimated range of life-cycle costs yet to be incurred (or remaining life-cycle costs) of $151 to $195 billion will be incurred to address the environmental legacy of nuclear weapons research, production, and testing and of DOE-funded nuclear energy and basic science research in the United States. Emphasis is being placed on finding cost-effective implementation strategies, continuing to use the best available science and technology, and working more closely with Federal and state regulators, tribal nations, local governments, and citizens. The DOE Environmental Management's Office of Integration and Disposition and the CBFO are working with representatives of stakeholder groups, the scientific community, contractors, and other DOE sites to develop strategic and operational plans to reduce the costs associated with TRU waste management while accelerating closure of certain sites whose only current function is to manage existing waste and infrastructure. Cost data in Chapter 4.0, Baseline Cost Estimates, indicate that TRU waste management activity will account for approximately $14.5 billion, or about 10 percent of the remaining life-cycle costs.

To prepare this revision of the National TRU Waste Management Plan, the CBFO used a strategic planning process as a framework to restructure its Plan and to put in place performance indicators to evaluate progress toward meeting established goals. The CBFO has assessed the DOE TRU waste system needs; assessed waste processing, treatment, packaging, transportation, and waste disposal capabilities; developed a vision and mission; and developed goals, objectives, and projected schedules to achieve that mission. Progress toward meeting established goals and objectives will be measured and the Plan will be revised, as indicated earlier in the document.

Successful integration of site-specific waste management planning with processing, treatment, packaging, transport, and disposal resources, and improving upon this integration (optimizing), depends on favorable resolution of technical and programmatic issues. The Integrated Program Strategy, designed to improve the DOE TRU waste system, involves a phased approach to transition the system from the baseline to an optimal state. This strategy will be accomplished in three steps:

- Increase the TRU waste disposal rates by taking actions that can be readily accomplished and will have a significant, positive impact on the ability of the TRU waste system to characterize, transport, and dispose of waste;

- Achieve economies and efficiencies by implementing recommendations including those from the reengineering processes. This effort also includes resolution of needs associated with the disposal of certain waste forms across the TRU waste system; and

- Ease the characterization responsibilities of small quantity TRU waste generators, to the maximum extent possible, by utilizing a centralized characterization facility to perform the required analysis to certify wastes to be disposed of at WIPP.

The Plan represents the baseline, or current state of the National TRU System. As indicated in Chapter 3, 127,100 m^3 or 66.5 percent of the total stored and projected volume of TRU waste has associated needs that must be fulfilled prior to waste disposal at WIPP. Resolution of the needs is a key component of the process to optimize the National TRU System. Some of the issues were identified during a FY 2000 reengineering effort and solutions are continuing to be developed. These include:

- A central confirmation facility (CCF) for TRU waste is being proposed to accelerate closure and reduce costs associated with waste removal from small quantity sites.

- Alternatives to shipping waste to WIPP using the TRUPACT-II/truck combination (e.g., rail transport, large Type B packaging) are being reviewed to allow large pieces of equipment/ material to be shipped to WIPP without requiring waste generator sites to reduce material size or repackage.

- Changes are being sought to the WIPP HWFP and other authorization basis documents to ease restrictions associated with the treatment, characterization, transportation, and disposal of TRU waste destined for WIPP.

- Equipment is being developed to allow the DOE to perform radioassay of large waste containers

TRU Waste Definition and Classifications

Transuranic (TRU) waste is defined by the WIPP Land Withdrawal Act (LWA) as: "waste containing more than 100 nanocuries of alpha-emitting transuranic isotopes per gram of waste with half-lives greater than 20 years, except for (A) high-level radioactive waste, (B) waste that the Secretary has determined, with concurrence of the U.S. Environmental Protection Agency (EPA) Administrator, does not need the degree of isolation required by the disposal regulations, or (C) waste that the Nuclear Regulatory Commission has approved for disposal on a case-by-case basis in accordance with part 61 of Title 10, Code of Federal Regulations (CFR)."

TRU waste is classified as contact-handled (CH) TRU or remote-handled (RH) TRU. CH TRU waste has radiation levels that are low enough to permit workers to directly handle the containers in which the waste is kept (not greater than 200 millirem per hour at the outside surface of the container). RH TRU waste has a surface dose rate of 200 millirem per hour or greater, so workers use remote handling equipment to move containers of RH TRU waste.

TRU waste is further classified as TRU waste or mixed TRU waste. Mixed TRU waste contains both radioactive and hazardous chemical compounds.

which will allow waste generator sites to certify large containers without repackaging.

The advantages of an integrated program strategy based on system-wide needs are:

- TRU waste management planning across the DOE TRU waste system is integrated, optimized, and matched with the transportation and disposal capability of WIPP;
- Site-specific requirements necessary to achieve system-wide compliance with Federal and state regulations and DOE Orders are identified and visible;
- Knowledge about the development and use of technologies and management practices, which can increase efficiency in managing TRU waste, is readily available and lessons learned are shared; and
- Knowledge about quantities of TRU waste that currently have no current plan for disposal is collected and strategies for disposal are implemented.

2.3.1 Technical and Programmatic Issues

During the development of Revision 2 of the Plan, the CBFO interfaced with the Western Governors' Association, the Southern States Energy Board, national laboratories, contractors, and other parts of the DOE to identify key areas of concern. The issues, or concerns, as well as a brief discussion of the current DOE strategies for resolution, were summarized in this section of Revision 2. This section has been updated to reflect any new information developed on these issues or concerns. Some subsections have been deleted (such as the subsection on asbestos) due to the resolution of the base issue.

2.3.1.1 Alpha Low-Level Waste

In 1970, the Atomic Energy Commission (AEC), the predecessor agency of the Energy Research and Development Administration and the DOE, required sites to begin segregating waste with known or detectable TRU contamination into retrievable storage pending permanent disposal. The AEC defined TRU waste as having activities greater than 10 nanocuries per gram of waste. In 1982, the DOE revised the definition of TRU waste as having activities greater than 100 nanocuries per gram of waste.

This revised definition of TRU waste created an inventory of low-level waste (LLW), mixed LLW, TRU waste, and mixed TRU waste stored at the same locations. Collectively, the waste has different disposal requirements, but no efficient, cost-effective means to differentiate between low-level and TRU waste containers exists. For this reason, the LLW contaminated with alpha-emitters (alpha LLW) is now managed as if it were TRU waste. The fraction of currently stored TRU waste in the DOE TRU waste system that may be alpha-contaminated LLW is estimated to be

between 20 percent and 40 percent of the estimated TRU volume, or between 22,000 m^3 and 44,000 m^3.

Some DOE sites that stored mixed TRU waste prior to 1982 have identified inventories of mixed alpha LLW. Under the current regulatory framework, sites will be required to establish a treatment process to comply with the Resource Conservation and Recovery Act (RCRA) or transport the waste to another site for treatment. Alternatives for the disposal of this waste are being considered. For example, mixed alpha LLW could be separated and treated to land disposal restriction standards for subsequent disposal.

2.3.1.2 Classified Materials Disposition

WIPP disposal of TRU-contaminated classified materials (e.g., molds and shapes used in weapons production) is being addressed under a plan developed by the CBFO. WIPP disposal of these materials will help the DOE:

- Meet agreements with various regulatory agencies,
- Reduce costs of continued storage, and
- Reduce the risks of chemical and/or radiological exposure to workers and the public.

Under the plan, RFETS will be able to ship classified TRU waste to WIPP after it has been characterized and certified to the criteria and requirements of the WIPP Waste Acceptance Criteria and the WIPP Hazardous Waste Facility Permit. The classified TRU waste will be declared irretrievably destroyed and effectively sanitized upon closure of the underground waste panels. CBFO is now identifying the site requirements and developing the specific plans for the appropriate level of security to allow the disposal of RFETS classified TRU waste.

2.3.1.3 Commercial TRU Waste

Very little of the TRU waste in the inventory reported in the Plan is classified as commercial waste. It is estimated that less than 700 m^3 of the waste is commercial. The West Valley Demonstration Project (WVDP), for example, reports an as-generated volume of approximately 548 m^3 of commercial TRU waste, most of which is expected to be classified as RH TRU waste. WVDP participants currently expect that the material will either be stored on site until it is transferred to a Federal repository or transferred off site to facilitate accelerated site cleanup activities. Future revisions of the Plan will update developments in this area and address disposal of commercial TRU waste, as appropriate.

2.3.1.4 Defense/Nondefense Waste

The *WIPP Land Withdrawal Act of 1992*, as amended, limits the waste that can be accepted for disposal at WIPP to TRU waste generated by atomic energy defense activities. Material that is solely nondefense TRU waste, which is in relatively small quantities at several sites, is, therefore, prohibited from being disposed at WIPP.

The strategic approach to address this waste involves identifying the inventory (volumes and locations, stored and projected) and then identifying and evaluating various disposal options (e.g., deep bore hole disposal, co-disposal with defense waste in WIPP). Disposal options will be evaluated based on legal and regulatory requirements and constraints, cost, public health and safety, environmental factors, institutional concerns, and other factors.

2.3.1.5 Generation of New Waste

Characterization of TRU waste accounts for the majority of the cost associated with the TRU Program. Significant cost savings may be achievable with a slight alteration of the waste generation process. Waste that has already been generated must undergo extensive characterization to meet the requirements of the WIPP Waste Analysis Plan and the certification requirements for disposal (i.e., headspace gas sampling, nondestructive examination, RCRA constituent sampling, analysis of homogeneous waste, and visual examination). Alternatively, waste that has to be repackaged or is being generated from a process line or decontamination/decommissioning activity can be generated in a way that supports disposal. Generating the data necessary for waste disposal within the framework of an adequate quality assurance program (e.g., two operators involved in data generation per process line; one to produce data and the other to validate) eliminates the later need to perform nondestructive examination of that waste as long as the data are collected under a properly designed and operated program.

Selection of the proper waste container will also reduce cost. Generators are encouraged to use the largest container possible when generating waste for disposal (e.g., a standard waste box or a ten drum overpack container) because of relative characterization costs. The cost to characterize a single large container is less than the cost to characterize the same volume of waste packaged in multiple drums or containers. A standard waste box, for example, has nine times the capacity of a standard 55-gallon drum. This approach also improves the efficiency of the transportation system by maximizing the use of the internal volume of the TRUPACT-II or other waste packaging.

2.3.1.6 High Wattage Waste (Plutonium-238 and Americium-241)

The CH TRU waste in the DOE waste inventory is predominantly contaminated with plutonium (Pu)-239. However, a significant amount of the total radioactivity of the waste comes from the presence of either Pu-238 or americium (Am)-241. In connection with the Nuclear Regulatory Commission limits for gas generation (limits that are applied to the TRUPACT-II and RH-72B), TRU waste contaminated with these radionuclides are significantly restricted. The cost associated with packaging, transport, and disposal of Pu-238 or Am-241 in these limited quantities is very restrictive.

To improve the shippability of these TRU wastes in the TRUPACT-II, Revision 19 of the TRUPACT-II Safety Analysis Report for Packaging was recently approved. As with each previous revision, this revision was prepared to expand the allowable payload capability of the packaging. Payload expansion initiatives related to the gas generation issue included:

- Dose-dependent gas generation values based on matrix depletion to establish higher allowable wattage limits;
- The use of payload container headspace gas measurement to qualify test category waste for shipment; and
- The addition of specifications for improved payload container and bag filters to take credit for lower resistance to hydrogen gas release and higher decay heat limits for packaging configurations using the improved filters.

High Wattage Waste

The overall design wattage limit for the TRUPACT-II package is 40 watts, which, for a payload of 14 drums, averages to 2.86 watts per drum, or 5 grams of Pu-238 per drum, or 25 grams of Am-241 per drum. The ability to ship these amounts per drum for Waste Material Type III.1 (solid organic material) is, for example, a reasonable and appropriate goal for a TRUPACT-II payload of 14 55-gallon drums.

The strategies for shipping greater amounts of TRU waste are supported by analyses in the Safety Analysis Report for Packaging [SARP] for the TRUPACT-II Shipping Package. The following changes were contained in Revision 19 of the SARP which was approved July 2001.

- *Reduction in Bounding G-Values - A factor of 3 reduction of gas generation potential can be achieved by taking credit for matrix depletion.*
- *Suitable Waste Packaging Configuration - Use of high-diffusivity filters in bags and drums to facilitate hydrogen release from waste containers.*

The following change is planned in a future SARP revision.

- *Reduction of Hydrogen in the TRUPACT-II Inner Containment Vessel (ICV) - Use of a hydrogen gas getter, which chemically reacts with hydrogen gas to reduce hydrogen concentration in the TRUPACT-II ICV.*

Additional strategies continue to be pursued to increase the capability of the TRUPACT-II.

2.3.1.7 Intersite Shipments

In the past, an option has been to consolidate small volumes of waste at larger sites to take advantage of existing infrastructure and waste handling experience. This option has been constrained by state equity issues, site schedules driven by compliance

issues, and permit limitations. The option is further constrained by a limited number of approved shipping packagings (TRUPACT-IIs). The SuperTiger shipping packaging and the ATMX-600 Series railcar were used in the past for intersite shipments, although these are now considered for use only in limited, special circumstances.

The Department of Transportation (DOT) has been willing to grant limited exemptions to its requirements in cases where an overall benefit can be demonstrated. For example, the Mound Facility (Mound) has a 2006 closure schedule. To achieve this closure date, approximately 150 cubic meters of TRU waste (currently packaged in drums and large boxes, and contaminated primarily with Pu-238) must be removed from the site. An additional 150 cubic meters could be generated in the future from decontamination and decommissioning activities. If this waste were to be shipped directly to WIPP in the TRUPACT-II, then the Mound Facility would need to construct a repackaging facility to segregate, repackage, and characterize this waste into containers acceptable for transport in the TRUPACT-II. However, Mound and the DOE have shown that a net benefit (as shown by a significant savings in costs and a reduction in risk) would be gained by not constructing this repackaging facility at Mound. Instead, the DOE is using two refurbished ATMX (designated as OHOX) railcars to ship this waste to the Savannah River Site (SRS) which has a similar Pu-238 contaminated waste stream.

Existing facilities at the SRS will then be used to segregate, repackage, and characterize this waste. To perform these shipments the DOT has approved, via a granted exemption, a limited number of shipments between Mound and SRS. The original exemption granted up to 10 shipments from Mound through May 2002 when the exemption would expire. However, due to slower than expected certification of the SRS/CCP activity, the DOT was reapproached and the original exemption was extended to November 30, 2003, to accommodate the anticipated Mound shipments. As part of the agreement, the DOE has committed to the State of South Carolina to accelerate the removal of TRU waste from the SRS site at twice the rate of receipt of TRU waste from Mound. SRS subsequently initiated shipments of TRU waste in the TRUPACT-II during May 2001. The first Mound shipment to SRS in the ATMX railcar was made in September of 2001.

The DOE may pursue a similar approach for other intersite shipments when it is not practical to prepare the waste on-site for direct shipment to WIPP or when studies can show that the overall risk is reduced. A risk analysis and cost/benefit analysis will be performed to determine the appropriate packaging.

2.3.1.8 Mode of Waste Transport

The majority of the TRU waste sites will use the TRUPACT-II, HalfPACT, or RH-72B shipping casks for transporting TRU waste to WIPP or for intersite shipments. These are Nuclear Regulatory Commission (NRC)-approved packagings and, in accordance with the Land Withdrawal Act, only NRC-approved Type B transportation packagings may be used for shipments to WIPP. Recently, an alternative cask for TRU waste was approved by the NRC. The Chem-Nuclear Systems (now Duratek, Inc.) 10-160B cask

(CNS 10-160B) was granted a Certificate of Compliance by the NRC on February 27, 2001, for the transport of limited quantities of transuranic materials from the Battelle Columbus Laboratory Decommissioning Project (BCLDP). As a singly contained packaging, the CNS 10-160B is limited to the transport of 20 curies or less of plutonium in any shipment. The packaging may be used to either transport the BCLDP TRU waste to WIPP for canisterization or may be used to consolidate the TRU waste at an intermediate site prior to shipment to WIPP.

Also, as discussed below in the summary for Section 2.3.1.16, the viability of TRU waste shipments to WIPP by rail is being investigated per the recommendations of the National Research Council. An evaluation report on the viability of TRU waste shipments to WIPP by rail was issued in April 2001. The report concluded that rail was a viable option for shipments to WIPP. A phased approach for performing limited trials of rail shipments from the sites to WIPP is being planned to examine the viability of this shipment option. As discussed in Section 2.3.1.7, some limited intersite shipments may be necessary and rail could be an option.

2.3.1.9 Non-Standard TRU Waste Containers

The assessment of the TRU waste inventory indicates the need for the development of a new NRC Type B packaging (e.g. the TRUPACT-III or other packaging) to accommodate existing oversized waste containers. The new packaging will be used to ship large parts and process equipment from decontamination and decommissioning activities that do not fit, or cannot easily be cut into pieces to fit, into standard waste containers, such as a 55-gallon drum, a standard waste box, or a ten-drum overpack. Oversized containers with a dimension larger than 6 feet in diameter and 6 feet in height, will not fit inside a TRUPACT-II. It is estimated that as much as 24 percent of the CH-TRU inventory may exist in oversized containers (4 feet by 4 feet by 7 feet or larger) that are not transportable in the TRUPACT-II or the HalfPACT.

In some cases, the information known about the content of oversized waste containers is adequate for shipping and may be sufficient for disposal. Transporting the waste to WIPP without additional repackaging is an attractive option if waste contents can be certified without opening the container. The cost and potential risk of repackaging this waste makes the evaluation of additional waste container and packaging alternatives desirable.

Options considered are:

- to establish repackaging and size reduction facilities and repackage the oversized waste inventory into drums, SWBs, or TDOPs for transportation in the TRUPACT-II and the HalfPACT;
- to design and develop a new packaging for the transportation of the oversized containers;
- to use or modify an existing packaging; or
- to use some combination of the above options.

To evaluate these options, a "TRUPACT-III Workshop" was held in February 2001, at the DOE-CBFO. This workshop was held to address that portion of the waste that is too large to be shipped in the TRUPACT-II or HalfPACT packagings. The TRUPACT-III Workshop also addressed a recommendation from the *CH-TRU Transportation System Rail Study* (DOE/WIPP 00-2016) to continue development of an alternative shipping package for CH-TRU waste for either rail or truck shipment. Building upon the results of the first TRUPACT-III Workshop, a second workshop was held in July 2001, to select a more specific design for the proposed TRUPACT-III option. Specific issues included the estimated amount of waste in oversize or odd-sized packages which may be shipped in the proposed packagings, the anticipated difficulty with licensing, possible difficulties with construction, and scheduling issues. A final strategy is now being prepared.

2.3.1.10 Polychlorinated Biphenyls-Contaminated Waste

Polychlorinated biphenyls (PCBs) are a subset of the man-made organic chemicals known as chlorinated hydrocarbons and are regulated under the Toxic Substances Control Act (TSCA). The TSCA regulates PCB-contaminated waste disposal in concentrations equal to or greater than 50 parts per million (ppm). The WIPP HWFP mirrors this limit and allows disposal of TRU waste containing PCBs in concentration of less than 50 ppm. The DOE TRU waste inventory, however, includes some PCB-contaminated waste at levels above 50 ppm.

The CBFO is pursuing PCB disposal authorization through the EPA so that PCB-contaminated TRU waste can be disposed of at WIPP. An application is being prepared, based upon inventory information provided by the TRU waste sites, to demonstrate that the disposal of PCB-contaminated TRU waste can be accomplished while continuing to protect worker safety, human health, and the environment. This application will allow the disposal of non-liquid PCBs without concentration limits. If this application is approved by the EPA Region 6 administrator, a request for a modification to the WIPP HWFP to dispose of PCB-contaminated TRU waste containing PCBs greater than 50 ppm will be submitted to NMED.

In addition to the application and permit modification, a supplement analysis has been prepared to revise the Record of Decision to allow for disposal of PCB-contaminated waste. Regulatory approvals are being aggressively pursued and could come as early as mid-FY 2002.

2.3.1.11 Prohibited Waste

Hazardous waste allowed for disposal at WIPP is listed in the WIPP HWFP, Module II, Table II.C.4, Permitted TRU Mixed Waste. The list contains U.S. EPA Hazardous Waste Codes that can be disposed at WIPP. As part of an ongoing effort, additional Hazardous Waste Codes are periodically added by permit modification as the need is identified. Several new codes were added during the previous year. States may assign a code to waste that is different from the EPA code (i.e., the state assigns a different code for the same waste or the state classifies a waste as hazardous that the EPA has

not defined as hazardous under RCRA rules). Waste with such codes exists in the DOE TRU waste system. This waste can be disposed of at WIPP as long as the waste is not otherwise prohibited from disposal at WIPP.

In addition to prohibiting the disposal of hazardous waste not listed in Table II.C.4, the WIPP HWFP also prohibits other kinds of items from shipment to and disposal at WIPP. These are listed in HWFP Module II.C.3. Waste that contains these prohibited items must have the prohibited item removed prior to certification for shipment to WIPP.

2.3.1.12 RH TRU Waste

The following issues were raised relative to the effect RH packaging limitations, variations in RH TRU inventory volumes, and the status of the EPA and NMED submittals on proposed RH TRU activities.

2.3.1.12.1 Packaging

The integrated program strategy calls for disposal of RH TRU waste at WIPP. The current shipping strategy includes the use of the RH-72B cask for transporting RH TRU waste although another cask, the 10-160B, has recently been approved for transporting RH TRU waste from BCL. Evaluation of the inventory in storage, however, has identified some RH TRU waste that is not amenable to transport in the RH-72B cask. For example, some waste contains neutron-emitting radionuclides or materials that will require additional shielding in the packaging for protection of workers and the public. Although multiple options exist (e.g., new packaging, modifications to payload requirements of the RH-72B, etc), the preferred strategy is to modify the existing shipping packaging by adding appropriate shielding. In this way, TRU waste that exhibits dose rates on the surface of the package that are typically consistent with RH TRU waste can be assembled in CH TRU waste packaging (i.e., surface dose rates will be less than or equal to 200 millirem per hour for transport and waste handling).

Analytical evaluations and design studies are under way in anticipation that a proposed revision to the TRUPACT-II SARP will be submitted to the NRC in the near term. In addition, this option may be a possible solution for excess inventory as described in Section 2.3.1.12.2.

2.3.1.12.2 RH Inventory

By agreement with the State of New Mexico and reaffirmed in the DOE's Record of Decision for WIPP (63 *Federal Register* [FR] 3623), up to 7,080 cubic meters of RH TRU waste can be disposed in WIPP. However, even though the current estimate of the RH TRU waste inventory is much less than 7,080 cubic meters, ongoing inventory assessments indicate that RH TRU waste in excess of this limit could be available (stored and newly generated) for disposal during the operational life of WIPP. This "excess" waste is a result of ongoing site characterization programs that provide an improved understanding of the characteristics of TRU waste in storage and ongoing

decontamination and decommissioning programs. In addition, newly generated waste will accrue from new program missions at selected sites. It is estimated that about 98% of the RH TRU waste will require either initial packaging or repackaging prior to shipment to and disposal at WIPP.

Of further concern is an aspect of the RH TRU emplacement process that requires the disposal of RH TRU waste in the walls of the rooms in advance of receipt of CH TRU waste. Under this aspect, RH TRU waste disposal positions become unavailable under the current emplacement plan as CH TRU is disposed. More positions will become unavailable due to the postponement of initial receipt of RH TRU waste shipments until the second quarter of FY 2005 and the accelerated disposal of CH TRU waste. If potential RH TRU waste volumes increase, then alternative emplacement options may need to be addressed to compensate for these unavailable disposal positions and thereby reach the disposal volume limit of 7,080 cubic meters.

As discussed in Section 3.2.1.1, Optimization of CH and RH Disposal Capabilities, current inventory projections do not indicate that this will be an issue. Should it be determined that additional RH TRU waste is identified, the DOE may be required to initiate discussions to either alter the method of emplacement or raise the disposal limits. Such a strategy will require additional National Environmental Policy Act activity, legal and regulatory changes, and technical changes in agreements with the State of New Mexico and the EPA.

2.3.1.12.3 RH-TRU Program Modifications

Between May 26, 1995, and November 20, 1997, the DOE submitted a Part B permit application to the NMED to manage, store, and dispose TRU waste at the WIPP. The application period included revised application submittals in which DOE responded to comments and NMED concerns. The NMED deemed the application complete on January 5, 1998, and issued the Permit on October 27, 1999. In the application, DOE requested authority to store and dispose both CH and RH TRU mixed waste at the WIPP; however, in the granted Permit (specifically, Permit Condition II.C.3.h), DOE was prohibited from accepting RH TRU mixed waste at the WIPP. The application proposed that the RH TRU waste would be characterized in the same way as CH TRU waste. The NMED placed the prohibition on RH TRU waste at the WIPP based on its determination that the DOE had not demonstrated that RH TRU waste could be successfully characterized in the same way as CH TRU waste. Specifically, the NMED stated that many of the characterization techniques used for CH TRU waste were not applicable to RH TRU waste; therefore, the DOE did not submit an "approvable" WAP for RH TRU waste. In particular, the NMED questioned DOE's ability to take samples and analyze them adequately for Resource Conservation and Recovery Act (RCRA)-regulated constituents using gloveboxes and remote machinery and the inability of radiography to penetrate lead shielding. These concerns were based on the fact that DOE proposed in the permit application to conduct physical sampling and analysis on the waste and to perform radiography of 100% of the waste.

During the same time period, the CBFO provided the U.S. Environmental Protection Agency Office of Radiation and Indoor Air (EPA/ORIA) with the Compliance Certification Application (CCA). The CCA provided the supporting documentation to demonstrate that long-term WIPP performance would satisfy the regulatory requirements contained in 40 CFR 191 and 194. Similar to the NMED's language for granting the WIPP HWFP, the EPA also found that insufficient detail was provided for the disposal of RH TRU at the WIPP.

The CBFO has therefore focused attention on greater development of the RH Program, its waste handling process and documentation, to eliminate these concerns. Physical modifications to the RH TRU facility were initiated to streamline the RH TRU handling process to assure greater efficiency in the handling of RH TRU waste. In addition, modifications were initiated to the WIPP HWFP and the CCA to address in greater detail the RH TRU characterization program. Drafts of these modifications have recently been reviewed by the Institute for Regulatory Science and the National Research Council's Committee on the Characterization of Remote-Handled Transuranic Waste for the Waste Isolation Pilot Plant. Findings and observations from these reviews are being incorporated into these documents prior to their final submittal to the regulatory agencies. It is anticipated that the revised documents will be submitted to the NMED and the EPA in June 2002.

2.3.1.13 TRU Waste Inventory Uncertainty

For the Plan, waste volume and cost data were derived from information reported by the sites in the Integrated Planning, Accountability, and Budgeting System (IPABS) and subsequently clarified with additional information from the TRU waste sites. Though several other sources of TRU waste data exist, the IPABS data are considered the most current and are intended to be internally consistent with regard to waste volumes, site infrastructure, plans, programs, and anticipated budgets. The CBFO has an active program with the TRU waste sites to assure that the IPABS and NTWMP data are consistent.

In using these data, however, the degree of uncertainty associated with the data must be recognized. This uncertainty causes the estimate of TRU waste in storage and projected to change as site activities proceed. Much of the data are dependent on historical waste disposal records at the sites, historical waste generation records, previous program mission information, or expectations of future program missions for projected waste volumes. The data are based on approximations or expectations of the waste volumes. Also, since only disposition streams that are currently recognized have been identified in the reported data, sites may identify additional waste streams in the future. Environmental restoration projects and decontamination and decommissioning activities have very broad levels of uncertainty associated with them and can result in highly variable estimates of waste volumes. Future DOE missions may also create additional waste streams with large uncertainties in waste volume estimates. It should also be noted that other sites with small amounts of TRU waste may be identified in the future. Though containing uncertainties, the data generally provide a good baseline estimate for evaluating resource requirements for the disposal of TRU waste.

To minimize differences in the data and subsequently improve consistency in the reporting of TRU waste data, the CBFO has initiated a campaign that focuses on centralizing the routine update of the sites' TRU waste information at WIPP. Key to this update will be the ability to correlate changes in the data with changes in DOE policies, regulatory changes, site programmatic changes, intersite shipments, disposal of waste, and improvements or changes in the sites' waste characterization processes. These controlled, routine updates will be maintained under a configuration management program and will form the basis of TRU waste information coordinated in the IPABS with the site budget forecasts. This information will also form the building blocks for the TRU waste inventory used to support the Compliance Recertification Application (CRA) and the Central Internet Database (CID). Coordination of these efforts will help ensure consistency in the use and presentation of these data for these interrelated programs, as well as other programs as additional needs are identified. To satisfy certain needs, such as to support the CRA, more detailed physical form information on the inventory will be required, but the basic TRU waste volume information will be consistent with that used in the IPABS and the CID.

2.3.1.14 WIPP Panel Closure

To comply with the RCRA air pathway requirements, each waste disposal panel, or hazardous waste disposal unit, must be closed when filled, or when it can no longer receive TRU mixed waste. The design of the panel closures is to reduce the potential releases of volatile organic compounds from exceeding health-based limits. The current design for panel closure, however, significantly exceeds the required performance level and can be modified without impacting human health or the environment.

WIPP developed performance-based design criteria with different levels of rigor (i.e., options) to provide closure based upon:

- The condition of the panel opening; and
- The length of time the repository is scheduled to remain open after the panel is closed.

These performance-based design criteria, as well as the design to meet the criteria, were submitted to the NMED and to the EPA to satisfy regulatory requirements. The EPA directed that only the most robust option be used for closure rather than allowing WIPP to exercise options based upon factors such as ground conditions. The NMED mirrored the EPA rulemaking and directed the selection of the most robust option.

The DOE believes that there are more cost-effective options for meeting the closure requirements. Therefore, through a series of working meetings, the DOE is pursuing several enhancements for the engineering design and construction of the panel closure system. The enhancements are based on a performance-based panel closure specification and design that will continue to ensure protection of human health and the environment by meeting the requirements of both RCRA and EPA.

In addition to evaluating a revised closure design, the decision was made in FY 2001 to bypass Rooms 4, 5, and 6 in Panel 1. These rooms had initially been mined in late 1987 and had remained open since that time. Deteriorating conditions in these rooms due to the natural closure of the salt led to the decision to not remine these rooms and emplace waste. The loss of these three rooms results in a overall panel room placement loss from the base case of approximately 30,000 drum equivalents or about 6,000 cubic meters.

2.3.1.15 WIPP Recertification

The WIPP Land Withdrawal Act of 1992 (amended 1996) designated the EPA as the regulator of the disposal standards for WIPP. This Act required the EPA to issue final disposal regulations, as well as issue criteria for certification of compliance with the disposal regulations for TRU waste. As stipulated in Section 8(f) of the LWA, the DOE must provide documentation of continued compliance not later than five years after the initial receipt of transuranic waste for disposal at WIPP, and every five years thereafter until disposal operations conclude. To date, the strategy of the recertification process is to simply document all efforts associated with the continued compliance with the original certification. The CBFO is planning to submit the compliance recertification application to the EPA in November of 2003.

In December of 2000, the EPA published a guidance document for recertification. This guidance refers to the application as a Compliance Recertification Application (CRA). The Agency recommends the CRA be submitted in November of 2003. Therefore, the Project schedules reflect all activities to be completed such that a complete CRA will be delivered to the EPA during the recommended timeframe. Relevant information will be summarized for the period from October 1996 through September 2002. The key data will then be analyzed for its potential to impact long-term performance utilizing the same methodology that was employed prior to TRU waste receipt.

2.3.1.16 Improving Operations and Long-Term Safety of WIPP

The National Research Council, organized by the National Academy of Sciences to provide services to the Federal government, convened a committee of experts to advise the DOE on the operation of WIPP. The committee was asked to provide recommendations on two issues: (1) a research agenda to enhance confidence in the long-term performance of WIPP; and (2) increasing the throughput, efficiency, and cost-benefit without compromising safety in characterizing, certifying, packaging, and shipping waste to WIPP. In its interim report, the committee provided the DOE with recommendations on several issues that the committee believes merit immediate consideration and action. In developing their report, the committee strove for "reasonableness" with respect to risks, costs, and the principle of maintaining radiation exposures ALARA (as low as reasonably achievable).

In June 2001, the National Research Council issued its final report, *Improving Operations and Long-Term Safety of the Waste Isolation Pilot Plant*. The final report

grouped findings and recommendations into three categories (1) site performance, (2) site characterization, and (3) the National TRU Program.

Under the National TRU Program, the committee raised two issues:

a) the cost and safety of current waste characterization and packaging requirements, and

b) the impact of the total inventory of organic materials in the repository.

For National TRU Program issues, the CBFO generally concurred with the National Research Council recommendations in the interim and final reports. Upon issuance of the NRC interim report, the CBFO had initiated review of activities in the areas of transportation and packaging. The CBFO also evaluated each of the report's recommendations for the National TRU Program. The status of each recommendation has been addressed in the previous NTWMP Quarterly Supplements.

2.3.2 Life-Cycle Waste Management Planning

Life-cycle planning is a collection of generally sequential project phases whose name and number are determined by the control needs of the organization(s) involved in the project. Life-cycle waste management planning requires an understanding of the volumes and characteristics of TRU waste in storage and projected to be generated, the availability and need for waste management facilities, and an approach for assessing program progress and compliance with elements of the program strategy. The development of the integrated program strategy is based on an understanding of the life-cycle waste management planning across the DOE TRU waste system and recognizes the vision of achieving the desired end state. Achieving this end state generally requires the integration of TRU waste inventory knowledge (in storage and to be generated) with life-cycle waste management planning to create a systemwide configuration. It also requires:

- Identifying and prioritizing site-specific waste management programs and projects necessary to achieve the desired systemwide configuration and to comply with applicable regulations and orders,
- Integrating site-specific waste management planning across the TRU waste system with the transportation system and disposal capabilities,
- Improving current and developing new technologies to affect an improvement in public health and safety, and efficiency in managing TRU waste, and
- Identifying and evaluating potential strategies for the disposal of TRU waste that currently cannot be accepted for disposal at WIPP.

Assessing progress in the course of implementing the integrated program strategy also is a key component of life-cycle planning. The DOE Office of Integration and Disposition and the CBFO will continue to assess the status of compliance with the objectives, and determine the need for reassessing or modifying the integrated program strategy. This assessment will require activities such as self-assessments, oversight assessments, progress tracking and reporting, and management reviews.

2.3.3 Waste Minimization and Pollution Prevention

The DOE Pollution Prevention Program is required by several internal and external drivers. In addition to specific regulatory requirements in the Resource Conservation and Recovery Act (RCRA), two Executive Orders (13101 and 13148) require the DOE to recycle and reduce wastes and control toxic chemical releases. Internal directives include DOE Order 435.1 and DOE Order 5400.1 for waste generators. DOE Order 5400.1 requires all sites to complete a site pollution prevention plan update every 3 years that provides details of their current and future program actions to reduce waste. Sites must outline their plans to comply with complexwide waste reduction goals issued by the Secretary.

In November 1999, the Secretary of Energy issued complexwide waste reduction goals to be achieved by the end of 2005. The goals require the DOE to reduce the generation of TRU waste from routine operations, such as equipment maintenance, by 80 percent compared to a 1993 baseline. In addition, there is an annual requirement to reduce all waste resulting from cleanup, stabilization, and decommissioning activities by 10 percent. This annual 10 percent goal includes TRU waste from environmental restoration, deactivation and decommissioning activities. Site project managers are required to evaluate their project activities to determine if cost-effective pollution prevention techniques can be applied to reduce waste and disposal cost. Operations and Field Offices managers are required to set goal targets for waste reduction (based on planned restoration and decontamination and decommissioning activities) each fiscal year as part of the EM management commitment process.

General and site-specific information on waste minimization and pollution prevention may be found on the DOE EM-22 Pollution Prevention Team's web site(s) (**http://www.em.doe.gov/wastemin** or **http://em.doe.gov/p2/**), for links to ongoing projects, including data from the Annual Report of Waste Generation and Pollution Prevention Progress and the Pollution Prevention Progress Reports.

2.3.4 Implementation of DOE Order 435.1

DOE Order 435.1, "Radioactive Waste Management," was issued on July 9, 1999. The Order applies to all new and existing radioactive waste management facilities, operations, and activities. As with Revision 2, this annual revision, Revision 3, of the Plan fulfills the obligation of the DOE Environmental Management's Deputy Assistant Secretary for Integration and Disposition to develop a systemwide program plan for TRU waste.

Chapter 3.0

The TRU Waste System Baseline Plan

3.0 THE TRU WASTE SYSTEM BASELINE PLAN

Chapter Highlights - This chapter was modified to reflect changes in the baseline plan. As described in Chapter 2, many of the issues are actively being addressed or in some cases have been resolved. The resolution and/or identified paths forward have changed the segregation of TRU waste in the three categories (waste with a clear path, waste with a plan, and waste without a plan). This section of the plan therefore identifies these changes in categorization and identifies the amount of waste which have been reassigned and those without a path forward. Recent changes in site shipping demands and expected transportation rates are discussed, as well as additional funding obtained to achieve a rate of 25 shipments per week. Performance Indicators are also presented for each site.

As identified in earlier sections, there are 27 DOE TRU waste sites, each having the similar goal of removal of TRU wastes from its facility. The activities required to meet this goal differ greatly among the sites. This chapter of the Plan integrates those activities and details the methods for measuring and reporting progress.

3.1 Management of DOE TRU Waste

As stated in Chapter 2, the mission of the program is to implement a TRU waste system that achieves the desired end state at each site. Key to achieving the end state is the understanding of the types and quantity of waste that must be disposed. The TRU waste sites provided volume information in the IPABS management tool. The information was compiled and used in this document as a basis for planning. In addition, the TRU waste sites provided information on the characteristics of the TRU waste and how these characteristics may affect the manner in which the waste is managed.

The total volume of TRU waste currently managed by the DOE (stored and projected) is estimated to be 191,100 m^3 of which 186,700 m^3 is CH TRU and 4,400 m^3 is RH TRU waste. A portion of this waste will be treated or repackaged prior to disposal, and the reported volumes may change depending on the selected processing or repackaging methodology. The volume to be disposed of at WIPP is 116,100 m^3, of which 113,300 m^3 is CH TRU (of which about 3,200 m^3 has already been disposed), and 2,800 m^3 is RH TRU waste. WIPP's total capacity for both CH TRU waste and RH TRU waste is set at 175,600 m^3 by the Land Withdrawal Act. The total volume of RH TRU waste cannot exceed 7,080 m^3. Table 3.1-1 shows stored, projected, and disposal volumes of CH TRU waste by site; Table 3.1-2 shows the same information for RH TRU waste by site.

Table 3.1-1 - Stored, Projected, and Disposal Volumes of CH TRU Waste by Site

SITE NAME	ABBREVIATION	LOCATION	CH TRU Waste Volume (m^3)				
			Stored (1)	Projected (2)	Total	Disposed (Actual) (3)	To Be Disposed (4)
ARCO Medical Products Co. (5)	ARCO	West Chester, PA	0.1	0.0	0.1	0.0	0.0
Argonne National Laboratory - East	ANL-E	Argonne, IL	88.6	169.0	257.6	0.0	150.7
Argonne National Laboratory - West	ANL-W	Idaho Falls, ID	0.1	8.2	8.3	0.0	0.0
Babcock & Wilcox - NES (6)	B&W-NES	Lynchburg, VA	18.1	0.0	18.1	0.0	18.1
Battelle Columbus Laboratories	BCL	Columbus, OH	1.9	0.0	1.9	0.0	1.9
Bettis Atomic Power Laboratory	BAPL	West Mifflin, PA	18.6	0.0	18.6	0.0	18.6
Energy Technology Engineering Center	ETEC	Santa Susana, CA	2.3	0.0	2.3	0.0	2.3
General Electric-Vallecitos Nuclear Center (6)	GE-VNC	Pleasanton, CA	0.0	20.0	20.0	0.0	20.0
Hanford Reservation	Hanford	Richland, WA	16,124.0	16,191.0	32,315.0	80.4	23,604.0
Idaho National Engineering and Environmental Laboratory	INEEL	Idaho Falls, ID	66,742.0	31,320.0 (7)	98,062.0	1,019.0	38,929.0
Knolls Atomic Power Laboratory	KAPL	Niskayuna, NY	0.0	0.0	0.0	0.0	0.0
Knolls Atomic Power Lab-Nuclear Fuel Services	KAPL-NFS	Erwin, TN	30.0	183.0	213.0	0.0	213.0
Lawrence Berkeley National Laboratory (5)	LBNL	Berkeley, CA	1.7	0.5	2.2	0.0	0.0
Lawrence Livermore National Laboratory	LLNL	Livermore, CA	294.0	1,401.0	1,695.0	0.0	920.8
Los Alamos National Laboratory	LANL	Los Alamos, NM	9,290.0	10,816.0	20,106.0	271.0	14,370.0
Lovelace Respiratory Research Institute (8)	LRRI	Albuquerque, NM	0.3	14.0	14.3	0.0	0.0
Missouri University Research Reactor	MURR	Columbia, MO	1.4	0.0	1.4	0.0	1.4
Mound Plant	Mound	Miamisburg, OH	247.0	0.0	247.0	0.0	0.0
Nevada Test Site	NTS	Mercury, NV	605.2	99.8	705.0	0.0	670.0
Oak Ridge National Laboratory	ORNL	Oak Ridge, TN	963.0	2,060.0	3,023.0	0.0	1,334.0
Paducah Gaseous Diffusion Plant (9)	PGDP	Paducah, KY	4.6	0.0	4.6	0.0	0.0
Rocky Flats Environmental Technology Site	RFETS	Golden, CO	4,457.0	10,295.0	14,752.0	1,740.0	13,768.0
Sandia National Laboratories-New Mexico (8)	SNL-NM	Albuquerque, NM	28.5	77.0	105.5	0.0	0.0
Savannah River Site	SRS	Aiken, SC	10,848.0	3,736.0	14,584.0	61.7	16,020.0
Separations Process Research Unit	SPRU	Schenectady, NY	470.0	0.0	470.0	0.0	50.0
U.S. Army Material Command	USAMC	Rock Island, IL	2.5	0.0	2.5	0.0	2.5
West Valley Demonstration Project (5)	WVDP	West Valley, NY	77.2	16.0	93.2	0.0	0.0
Total Waste Volumes (10)			110,315.8	76,298.4	186,614.3	3,172.1	110,094.9

Footnotes for Table 3.1-1

(1) The collection and management of waste for the purposes of awaiting processing or disposal capability, in such a manner as to not constitute disposal of the waste.

(2) The part of the inventory that has not been generated but is currently estimated to be generated at some time in the future.

(3) Volume disposed of at WIPP as of December 31, 2001.

(4) Volume to be disposed of at WIPP. The quantities reflect any volumetric expansion or reduction that would occur during waste processing.

(5) Waste is of commercial origin and does not meet the Land Withdrawal Act (LWA) requirement for disposal at WIPP.

(6) Waste may not be of defense origin; compliance with LWA requirement will need to be demonstrated prior to disposal at WIPP.

(7) The Total waste volume reflects some portion that will not be classified as TRU waste, but will be considered alpha-contaminated low level waste.

(8) Waste from LRRI is shipped to SNL-NM for subsequent shipment with SNL-NM waste to LANL. LRRI and SNL-NM total waste volumes of 14.3 m^3 and 88.5 m^3, respectively, are included in the LANL total waste volume.

(9) Waste from PGDP is planned to be shipped to ORNL for subsequent shipment to WIPP for disposal. The original PGDP total waste volume of 4.6 m^3 the ORNL total waste volume as a packaged volume of 11.7 m^3.

(10) The total waste volume to be disposed of differs slightly from the 106,387 m^3 cited in the Revision to the Record of Decision for the DOE's Waste Management Program: Treatment and Storage of Transuranic Waste, published in the *Federal Register* on December 29, 2000. It should be noted that the total waste volume shown in the table is consistent with the 113,592 m^3 originally evaluated in the Waste Management Programmatic Environmental Impact Statement (DOE/EIS-0200-F, May 1997).

Table 3.1-2 - Stored, Projected, and Disposal Volumes of RH TRU Waste by Site

SITE NAME	ABBREVIATION	LOCATION	RH TRU Waste Volume (m^3)			
			Stored (1)	Projected (2)	Total	To Be Disposed (3)
ARCO Medical Products Co.	ARCO	West Chester, PA	0.0	0.0	0.0	0.0
Argonne National Laboratory - East	ANL-E	Argonne, IL	2.0	8.0	10.0	10.0
Argonne National Laboratory - West	ANL-W	Idaho Falls, ID	1.1	5.0	6.1	0.0
Babcock & Wilcox - NES	B&W-NES	Lynchburg, VA	0.0	0.0	0.0	0.0
Battelle Columbus Laboratories	BCL	Columbus, OH	0.0	31.2	31.2	0.0
Bettis Atomic Power Laboratory	BAPL	West Mifflin, PA	2.0	0.0	2.0	2.0
Energy Technology Engineering Center	ETEC	Santa Susana, CA	8.7	0.0	8.7	8.7
General Electric-Vallecitos Nuclear Center (4)	GE-VNC	Pleasanton, CA	11.8	0.0	11.8	11.8
Hanford Reservation	Hanford	Richland, WA	207.0	944.0	1,151.0	1,048.0
Idaho National Engineering and Environmental Laboratory	INEEL	Idaho Falls, ID	84.0	616.0	700.0	1,175.0
Knolls Atomic Power Laboratory	KAPL	Niskayuna, NY	3.1	0.0	3.1	3.1
Knolls Atomic Power Lab-Nuclear Fuel Services	KAPL-NFS	Erwin, TN	0.0	0.0	0.0	0.0
Lawrence Berkeley National Laboratory	LBNL	Berkeley, CA	0.0	0.0	0.0	0.0
Lawrence Livermore National Laboratory	LLNL	Livermore, CA	0.0	0.0	0.0	0.0
Los Alamos National Laboratory	LANL	Los Alamos, NM	98.0	23.5	122.0	122.0
Lovelace Respiratory Research Institute	LRRI	Albuquerque, NM	0.0	0.0	0.0	0.0
Missouri University Research Reactor	MURR	Columbia, MO	0.0	0.0	0.0	0.0
Mound Plant	Mound	Miamisburg, OH	0.0	0.0	0.0	0.0
Nevada Test Site	NTS	Mercury, NV	0.0	0.0	0.0	0.0
Oak Ridge National Laboratory	ORNL	Oak Ridge, TN	1,308.0	534.0	1,841.0	453.0
Paducah Gaseous Diffusion Plant	PGDP	Paducah, KY	0.0	0.0	0.0	0.0
Rocky Flats Environmental Technology Site	RFETS	Golden, CO	0.0	0.0	0.0	0.0
Sandia National Laboratories (5)	SNL-NM	Albuquerque, NM	1.5	22.0	23.5	0.0
Savannah River Site	SRS	Aiken, SC	1.0	0.0	0.0	0.0
Separations Process Research Unit	SPRU	Schenectady, NY	0.0	0.0	1.0	0.0
U.S. Army Material Command	USAMC	Rock Island, IL	0.0	0.0	0.0	0.0
West Valley Demonstration Project (6)	WVDP	West Valley, NY	470.5	8.4	478.9	0.0
Total Waste Volumes			2,198.6	2,174.9	4,373.4	2,840.0

Footnotes for Table 3.1-2

(1) The collection and management of waste for the purposes of awaiting processing or disposal capability, in such a manner as to not constitute disposal of the waste.

(2) The part of the inventory that has not been generated but is currently estimated to be generated at some time in the future.

(3) Volume to be disposed of at WIPP. The quantities reflect any volumetric expansion or reduction that would occur during waste processing.

(4) Waste may not be of defense origin; compliance with LWA requirement will need to be demonstrated prior to disposal at WIPP.

(5) Waste from SNL-NM is shipped to LANL. SNL-NM total waste volume of 23.5 m^3 is included in the LANL total waste volume.

(6) Waste is of commercial origin and does not meet the LWA requirement for disposal at WIPP.

The total stored and projected volumes were segregated into three categories to enable site TRU program and TRU waste managers and the CBFO to develop operational and strategic plans for managing TRU waste. Figure 3.1-1 presents the following three categories and associated volumes. (Note: volumes are rounded to the nearest hundred for data presentation.)

TRU waste with a clear path for disposal	54,700 m^3
TRU waste with a plan for disposal	127,100 m^3
TRU waste without a current plan for disposal	9,300 m^3
Total	191,100 m^3

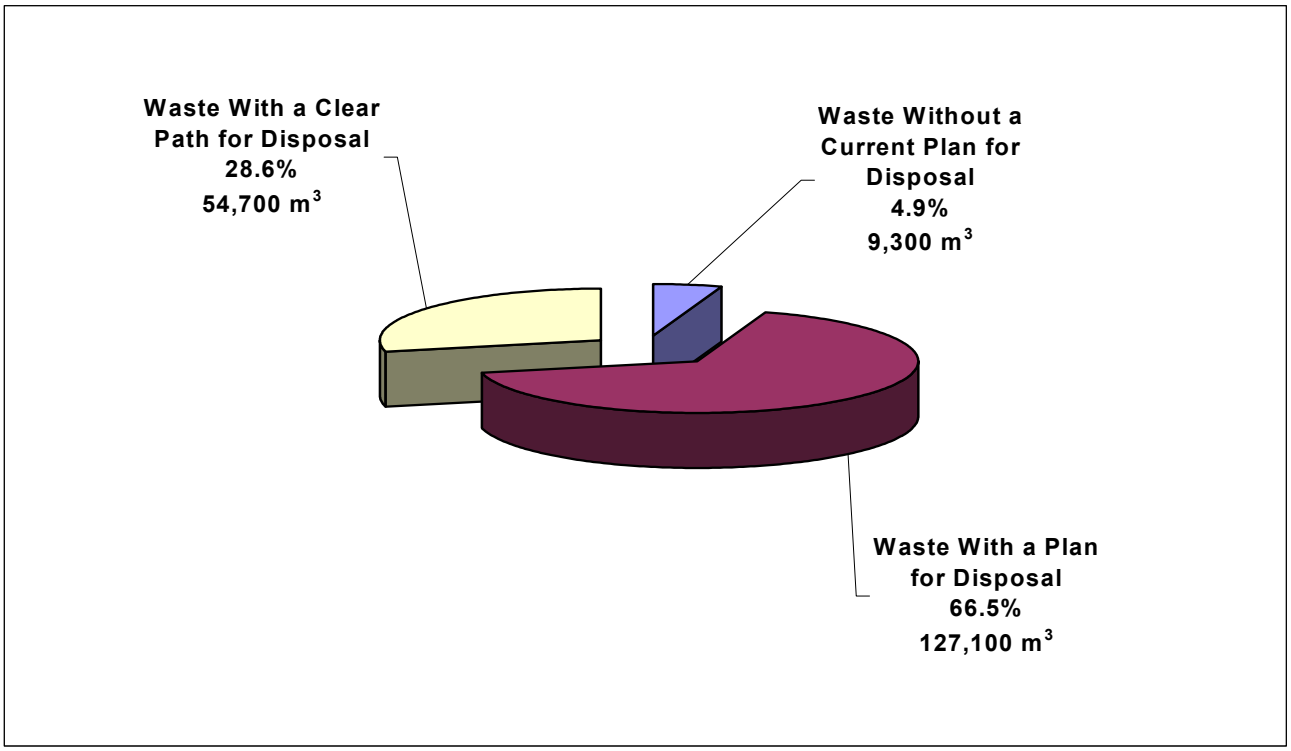


Figure 3.1-1 - TRU Waste Managed by the DOE

3.1.1 TRU Waste with a Clear Path for Disposal

WIPP is the DOE's only permitted TRU waste disposal facility. Currently, the only TRU waste with a clear path for disposal is that waste destined for WIPP. Waste with a clear path for disposal is waste that can readily be certified for disposal under the current regulatory framework and that has the associated infrastructure in place for its disposition. WIPP-acceptable waste is defined as defense-generated TRU waste that can conform to the requirements of the WIPP WAC and the WIPP HWFP. As shown in

Figure 3.1-1, about 29 percent, or 54,700 m^3, of the TRU waste managed by the DOE has a clear path for disposal, most of which resides at Hanford, LANL, and RFETS.

3.1.2 TRU Waste with a Plan for Disposal

Waste with a plan for disposal is waste with an associated need that must be fulfilled prior to the generator site being able to certify the waste for disposal. As shown in Figure 3.1.2-1, these needs are primarily in terms of infrastructure (e.g., planned waste repackaging or processing facilities), technology needs (e.g., development of a hydrogen getter to remove excess hydrogen from waste packages), and regulatory issues (e.g., WIPP requires a change to allow disposal of PCB contaminated waste). An alternative strategy being pursued for smaller TRU waste generator/storage sites is

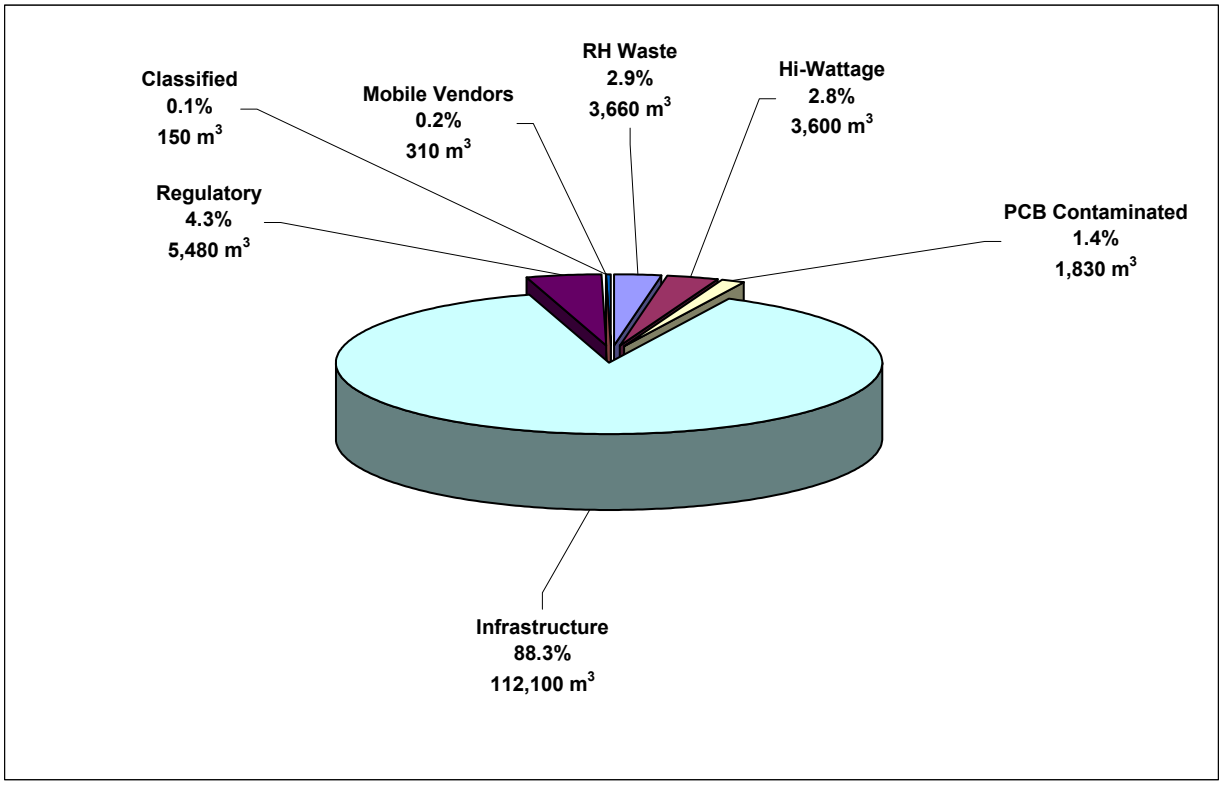


Figure 3.1.2-1 - Associated Needs That Must Be Fulfilled Prior to TRU Waste Disposal at WIPP

to characterize waste for transportation only and then send it to WIPP for disposal characterization in the centralized confirmation facility (CCF). Once characterized and certified, the waste would be disposed of in WIPP under the Centralized Characterization Project (CCP). "Mobile Vendors" includes waste considered for CCP/CCF. The DOE has plans in place for the funding and construction of the required infrastructure as well as for the development and implementation of the required technologies and regulatory change. The plans are represented in the site-specific portions of Appendix 1.

3.1.3 TRU Waste Without a Current Plan for Disposal

In accordance with DOE Order 435.1, "Radioactive Waste Management," the DOE is responsible for disposition of all categories of TRU waste under its control. Waste without a current plan for disposal is TRU waste that is either prohibited from disposal at WIPP or will be generated after the end of WIPP's planned operational life. Although a small amount, the waste of primary concern is that prohibited from disposal at WIPP by current legislation, such as waste contaminated with reactive or corrosive substances, and TRU waste generated from nondefense activities (see Figure 3.1.3-1).

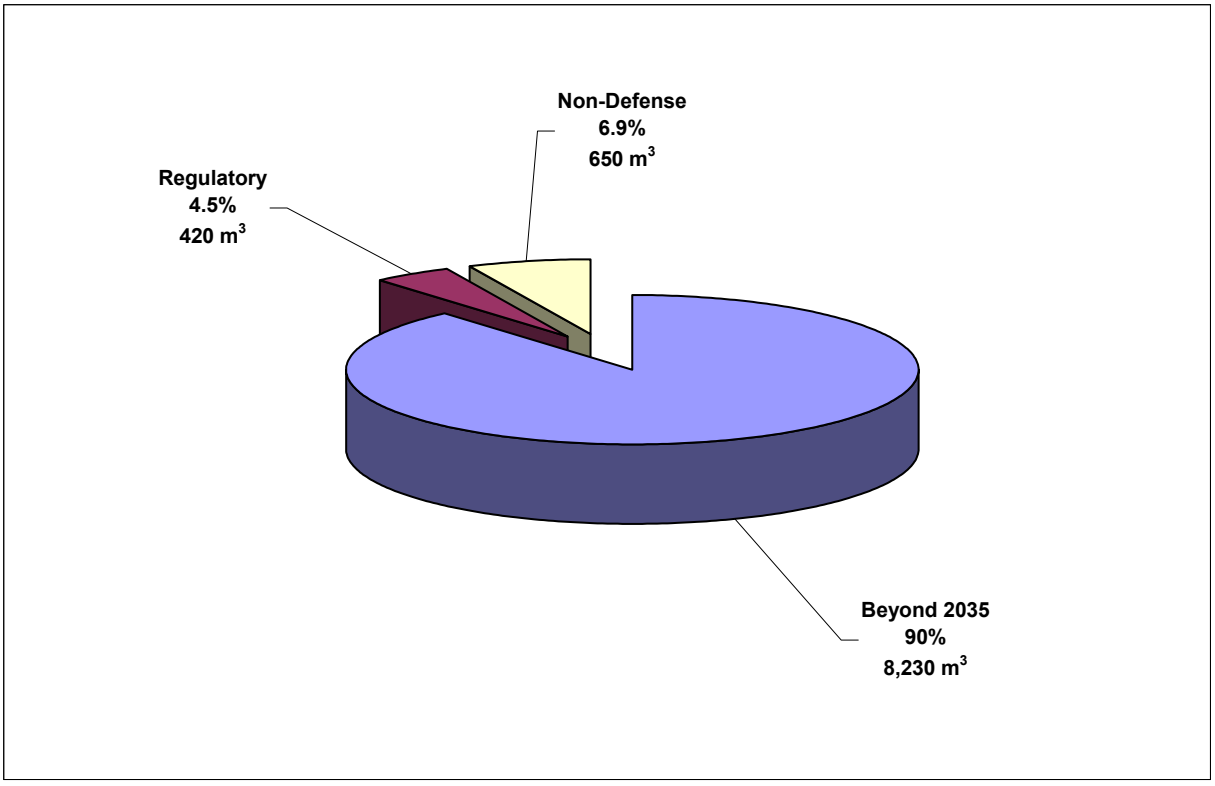


Figure 3.1.3-1 - TRU Waste Not Acceptable for Disposal at WIPP

The remainder of the waste is waste projected to be generated after the end of WIPP's planned operational life. WIPP's planned operational life is based on its being used as a disposal facility for 35 years with closure in 2034. At some point close to the end of the assumed operational lifetime, the facility will be evaluated to determine if it is technically and economically feasible to continue operations. The cost of continued operations will be compared with the cost of building an alternative facility or other means of waste disposal. The over-arching concern will be to ensure the waste has a disposal path.

Chapter 4.0

Baseline Cost Estimates

4.0 BASELINE COST ESTIMATES

Chapter Change Summary - This chapter has been modified from Revision 2 of the plan based on recent changes in the IPABS data and discussions with personnel at the generator sites. The time period for cost baseline covers FY 2002 through FY 2034 and represents the "cost to completion" consistent with standard cost control terminology. In addition, the Carlsbad Operations costs for transportation, disposal, and other mission-critical activities have been adjusted beyond FY 2015 to account for average shipping rates that are less than the previously assumed 17 shipments per week throughout the WIPP facility operating lifetime.

The cost baseline for the Plan has been developed from the cost estimates identified in the IPABS data base with additional information from selected sites. The cost baseline assumes full compliance with environmental, safety, and other regulatory requirements, agreements and orders. This chapter of the plan will be revised as major changes that impact the current TRU waste system dictate that Program costs be re-baselined.

4.1 Generator Sites Cost Baseline

A major portion of each site's cost is a function of the throughput of waste, from retrieval/generation through shipment. These "variable costs" include processing (e.g., repackaging), waste characterization and certification, and preparation of shipments (i.e., package assembly, loading the shipping container, and transportation certification and documentation). Although these costs vary from site to site, over the complex they constitute about 75 percent of the total generator site budget. The variable cost component is a major driver for the detailed evaluation of potential efficiency improvements, particularly in the characterization and certification processes.

The generator sites baseline assumes that each major site will characterize, certify, and load its own waste in preparation for transportation to and disposal in the WIPP facility. Also, the baseline assumes that the individual site cost baseline is consistent with the waste quantities planned to be shipped to the WIPP in any given fiscal year (see Section 3.0). It should be noted that the current baseline for the total shipments of waste in the near term (about the next four years) exceeds the current transportation system capabilities (i.e., the number of trucks and shipping containers existing and planned is less than the demand projected by the generator sites). Until this apparent "mismatch" between generator site planning and the WIPP transportation system capability is corrected, it is assumed that the generator site will characterize and certify their waste on their current schedules, package and certify payload container assemblies ready for loading, and place the assemblies in storage until they can be shipped to the WIPP facility.

Site IPABS data for sites with continuing TRU waste operations beyond the WIPP schedule for closure in FY 2034 include costs for FY 2035 in the five-year IPABS

reporting period (i.e., FY 2031 – FY 2035). The IPABS costs for these sites are reduced by 20 percent before incorporation into the WIPP cost baseline.

4.2 Carlsbad Operations Cost Baseline

Carlsbad Operations include cost for operating the WIPP facility, developing and operating the waste transportation system, and funding the DOE and WIPP M&O support contractors. The WIPP planning budget provided in IPABS is based on relatively detailed planning through FY 2008. For FY 2009 through FY 2034, the IPABS budget is based on the budget estimates for FY 2004 through FY 2008, which are then escalated at 2.1 percent per year through completion of operations and account for known changes in activity level (i.e., panel closures, 5-year recertification cycle, etc.). The IPABS budget assumes that the work load at the WIPP facility will remain constant until the beginning of site closure in FY 2035 and does not take into account that the amount of waste to be received and disposed declines significantly in the out-years beyond FY 2015. The cost baseline for Carlsbad Operations provided in this chapter has been adjusted to account for the out-year reduction in shipping rates as discussed below.

The Carlsbad Operations costs have been subdivided into transportation, disposal, and other mission-critical cost categories to facilitate evaluating potential program improvements and other cost evaluations. As noted above, the baseline shipping schedule (i.e., the current shipping demand established from the planned annual shipments from the individual generator sites) peaks in FY 2004-2005 at more than 20 shipments per week then levels out for FY 2006 through FY 2015 at about 17 shipments per week. Beyond FY 2015 the annual shipping rate drops precipitously because many of the sites have completed processing and shipping their TRU waste and much of the remaining waste is being generated by ongoing site programs.

To account for the marked decrease in demand for Carlsbad Operations support for transportation, disposal, and other mission-critical activities, the individual scopes of the WBS elements for Carlsbad Operations were reviewed to determine which activities varied as a function of waste shipments and which activities remained essentially fixed over the operating life of the WIPP facility. The costs that were determined to be "variable" were converted to percentages of the total (i.e., variable plus fixed) costs for each of the three Carlsbad Operations cost categories. The percentages were then applied to the total costs for each 5-year period (4-year period for FY 2031-2034) starting in FY 2016. The percentages used are as follows:

- Transportation – 41 percent
- Disposal – 59 percent
- Other Mission-Critical – 13 percent

Review of the site total shipment numbers and the Carlsbad Operations capacity to

transport waste indicates that a load-leveled shipping rate of 17 shipments per week would be sustained to about the end of the FY 2010 - 2015 time period. Starting in FY 2016 the variable cost percentages listed above are applied to each of the Carlsbad Operation cost categories in each of the five-year periods in proportion to the variation in shipping rate below the baseline value of 17. For example, if the average shipping rate in a given five-year period were 12 per week, the variable cost for transportation in that year (i.e., 41 percent of the transportation total cost) is reduced by 29.4 percen (i.e., 1 – 12/17 = .294).

The paragraphs below describe the activities included in each of the three Carlsbad Operations cost categories.

Transportation Costs

Transportation costs are derived from the IPABS data for the Carlsbad Operations as Projects CBFO - 03 (Transportation) and 99-PVT-1 (Privatization), plus the New Mexico Impact Assistance portion of CBFO - 08, which amounts to more than $20 million per year for the improvement of highways in New Mexico. The Transportation Project, CBFO - 03, includes:

- Transportation of TRU waste to WIPP and selected intersite shipments;
- The TRUPACT II and HalfPACT fabrication contracts;
- Trailers for shipping both CH TRU and RH TRU waste;
- Opening and maintaining transportation corridors;
- Emergency response training along transportation corridors; and
- Other critical transportation support operations at WIPP and the CBFO.

The Privatization Project, 99-PVT-1, covers the RH 72-B Fabrication Contract awarded during calendar year 2000 for a total of $15.5 million.

Disposal Costs

Disposal Costs include the following IPABS data:

- WIPP surface facilities, including utilities, waste handling systems, and plant operations;
- WIPP underground facilities, including hoisting, ground control, mining, underground utilities, operations support, and maintenance;
- Safety and health; and
- Other activities, including specific mining and readiness initiatives.

Other Mission-Critical Activities

The remaining mission-critical costs are associated with:

- Surface operations;
- Project planning and control;
- Security;
- Quality assurance;
- Permitting and regulatory compliance;
- Procurement, finance, and legal;
- Human Resources;
- Information Services and WWIS;
- Public affairs and outreach;
- Characterization and certification support; and
- Other related activities.

4.3 Baseline Cost Data

Table 4.3-1 presents the program cost baseline for the period FY 2002 through FY 2034. The baseline is identified on an annual basis through FY 2010 and in five-year increments thereafter (except for FY 2031-2034) consistent with the IPABS long-term planning cycle. Table 4.3-1 is based on IPABS data as of November 1, 2001, adjusted as described in the previous sections.

Table 4.3-1 - Baseline Cost Data[1]
(Current Year Dollars in Thousands)

SITE - DATA SOURCE/FISCAL YEAR	2002	2003	2004	2005	2006	2007	2008	2009	2010
GENERATOR SITES									
Argonne National Laboratory - East -- FY 00 Site Data	8,450	9,450	700	700	700	700	700	700	2,700
Argonne National Laboratory - West - FY 00 Site Data									1,276
ARCO- Extrapolated - Note (3)				23					
Babcock & Wilcox-NES - Extrapolated - Note (3)		4,163							
Battelle Columbus Laboratories - Extrapolated - Note (3)	6,716								
Bettis Atomic Power Laboratory - Note (2)									
Energy Technology Engineering Center - FY 01 IPABS Data	660	555	1,330						
GE-Vallecitos Nuclear Center - Extrapolated - Note (3)			1,196	1,196	1,196	1,196			
Hanford Site - FY 01 IPABS Data	24,269	31,956	31,782	32,377	30,355	32,906	33,697	37,253	42,595
Idaho National Engineering and Environmental Laboratory - FY 01 IPABS data	72,937	91,244	144,179	197,504	206,744	125,740	99,323	39,542	40,952
Knolls Atomic Power Laboratory - Note (2)									
Knolls Atomic Power Laboratory - Nuclear Fuel Services	14,090	14,385	12,239	10,747					
Lawrence Berkeley National Laboratory - FY 01 IPABS data									
Lawrence Livermore National Laboratory - FY 01 IPABS data	2,753	2,765	2,540	2,609	2,629	2,986	3,776		
Los Alamos National Laboratory - FY 01 IPABS data	18,841	18,841	19,764	23,657	23,862	24,976	25,501	26,038	26,586
Lovelace Respiratory Research Institute - FY 01 IPABS data	1								
Mound - FY 01 IPABS data	79								
Missouri University Research Reactor - Note (2)									
Nevada Test Site - FY 01 IPABS data	6,394	6,691	5,488	5,853	3,115	4,694	5,912	3,716	
Oak Ridge National Laboratory - FY 01 IPABS data	8,272	76,004	53,853	35,455	17,025	16,742	8,946	8,422	3,359
Paducah Gaseous Diffusion Plant - FY 01 IPABS data			28						
Rocky Flats Environmental Technology Site - FY 01 IPABS data	13,700	9,412	4,416	3,183	1,944	502			
Savannah River Site - FY 01 IPABS data for 2002; FY 00 site data for rest	16,726	26,244	18,942	14,047	37,872	39,127	40,794	16,226	79,133
Separation Process Research Unit								2,716	2,773
U.S. Army Material Command - Note (2)									
West Valley Demonstration Project					20,414	20,843	21,281	21,729	22,185
SUBTOTAL, Generator Sites	193,888	291,720	296,457	327,351	345,856	270,412	239,930	156,342	221,559
CARLSBAD OPERATIONS - Note (4)									
Transportation - Note (5)	67,659	70,115	55,531	56,023	55,574	55,906	55,936	62,738	48,937
Disposal - Note (6)	54,410	54,843	60,374	46,856	51,132	48,722	53,411	66,985	34,932
Remaining Mission-Critical Activities - Note (7)	106,735	110,743	102,162	101,231	103,362	106,124	109,334	118,074	80,031
SUBTOTAL, Carlsbad Operations	228,804	235,701	218,067	204,110	210,068	210,752	219,681	247,797	163,900
GRAND TOTAL	422,692	527,421	514,524	531,461	555,924	481,164	459,611	404,139	385,459

NOTES:

(1) Cost data are based on budget planning levels. Near-term fiscal year target levels are achieved when planning level data are validated.

(2) "0" in FY 2002 for small quantity site indicates that site costs for waste removal are either insignificant or will be funded from non-EM source.

(3) Cost for an SQS with no IPABS or site provided data (ARCO, BCL, B&W, and GE) are estimated using the weighted average cost/cubic meter calculated from ANL-E and ETEC cost and volume data to be $230K/m^3.

(4) The Carlsbad Operations IPABS costs for Transportation, Disposal, and Remaining Mission-Critical Activities from FY 2009 through FY 2034 are estimated based on FY 2004-2008 planning data escalated by 2.1% (See Notes (5), (6) and (7) for estimate adjustments).

(5) Transportation includes CBFO projects: #03 - WIPP Transportation, #06 - Privatization, and #08 - Economic Assistance to the State of New Mexico. The privatization figure represents $15.513 million budget outlay during FY 2001-2003 for budget authorized in FY 1999 for RH TRU cask procurement. The variable transportation cost (41% of the total) for each year from FY 2016 through FY 2034 is reduced in proportion to the reduction in shipping rate from the baseline average of 17 shipments per week to the rate applicable to each year.

Table 4.3-1 - Baseline Cost Data (Continued)
(Current Year Dollars in Thousands)

SITE - DATA SOURCE / FISCAL YEAR	2011-2015	2016-2020	2021-2025	2026-2030	2031-2034 Note (8)	TOTAL
GENERATOR SITES						
Argonne National Laboratory - East -- FY 00 Site Data	700	4,000	1,000	4,000	800	35,300
Argonne National Laboratory - West - FY 00 Site Data	14,453					15,729
Atlantic Richfield Company - Extrapolated - Note (3)						23
Babcock & Wilcox-NES - Extrapolated - Note (3)						4,163
Battelle Columbus Laboratories - Extrapolated - Note (3)						6,716
Bettis Atomic Power Laboratory - Note (2)						0
Energy Technology Engineering Center - FY 01 IPABS Data						2555
GE-Vallecitos Nuclear Center - Extrapolated - Note (3)						4,784
Hanford Site - FY 01 IPABS Data	243,815	279,807	306,121	303,976	17,479	1,448,388
Idaho National Engineering and Environmental Lab - FY 01 IPABS	174,014	59,954				1,252,133
Knolls Atomic Power Laboratory - Note (2)						0
Knolls Atomic Power Laboratory - Nuclear Fuel Services						51,461
Lawrence Berkeley National Laboratory - FY 01 IPABS data						0
Lawrence Livermore National Laboratory - FY 01 IPABS data						20,058
Los Alamos National Laboratory - FY 01 IPABS data	126,782	155,565	172,646	191,595	110,739	965,393
Lovelace Respiratory Research Institute - FY 01 IPABS data						1
Miamisburg Environmental Management Project - FY 01 IPABS data						79
Missouri University Research Reactor - Note (2)						0
Nevada Test Site - FY 01 IPABS data						41,863
Oak Ridge National Laboratory - FY 01 IPABS data	10,302					238,380
Paducah Gaseous Diffusion Plant - FY 01 IPABS data						28
Rocky Flats Environmental Technology Site - FY 01 IPABS data						33,157
Savannah River Site - FY 01 IPABS data for 2002; FY 00 data for rest	421,199	297,163	336,797	385,168	355,667	2,085,105
Separation Process Research Unit	8,672					14,161
U.S. Army Material Command - Note (2)						0
West Valley Demonstration Project	49,719					156,171
SUBTOTAL, Generator Sites	1,049,656	796,489	816,564	884,739	484,686	6,375,649
CARLSBAD OPERATIONS - Note (4)						
Transportation - Note (5)	327,682	272,297	297,738	336,600	261,078	2,039,195
Disposal - Note (6)	301,844	214,796	232,473	266,287	194,551	1,698,671
Remaining Mission-Critical Activities - Note (7)	609,182	636,347	705,412	765,995	709,155	4,396,172
SUBTOTAL, Carlsbad Operations	1,238,708	1,123,440	1,235,623	1,368,883	1,164,784	8,134,038
GRAND TOTAL	2,288,364	1,919,929	2,052,187	2,253,622	1,649,470	14,509,687

NOTES:

(6) Disposal includes underground facilities, surface facilities, safety and health, and mining and waste operations. The variable disposal cost (59% of the total) for each year from FY 2016 through FY 2034 is reduced in proportion to the reduction in shipping rate from the baseline average of 17 shipments per week to the rate applicable to each year.

(7) Disposal is not a stand-alone operation. It also requires other mission-critical activities, including security, quality assurance, permitting, regulatory compliance, and other related functions. The variable mission-critical activity cost(13% of the total) for each year from FY 2016 through FY 2034 is reduced in proportion to the reduction in shipping rate from the baseline average of 17 shipments per week to the rate applicable to each year. Non-mission critical activities (e.g., US/Mexico/Border/Material parnership Initiative and other Congressional Mandates) are not included.

(8) Field site cost data for the period FY 2031-FY 2034 are 80% of the values reported in IPABS-IS or by the sites for the period FY 2031-2035.

Chapter 5.0

Path Forward for the TRU Waste System

5.0 PATH FORWARD FOR THE TRU WASTE SYSTEM

Substantial progress has been made across the TRU waste system since the last revision of the Plan was issued in January 2001. During the past year, WIPP has disposed of CH TRU waste from LANL, INEEL, RFETS, Hanford, and SRS. Through the end of calendar year 2001, these five sites have shipped 493 shipments to WIPP and WIPP has disposed of 3,172 cubic meters of TRU waste. Significant advancements in the planning for production-level processing and treatment facilities have occurred at INEEL and ORNL, and significant progress has been made in the certification of Centralized Characterization Project activities at three sites, SRS, ANL-E, and NTS. The DOE continues working toward improving and streamlining TRU waste system operations.

At the current time, projected site shipment demand is forecast to exceed transportation and disposal capabilities during FY2002. The current transportation budget supports 17 shipments to WIPP per week while the WIPP operational budget supports disposal operations equivalent to 51 TRUPACT-IIs processed per week at WIPP. The disposal capability of 51 TRUPACT-IIs per week is based on the weekly shipment rate of 17 shipments per week with three TRUPACT-IIs per shipment. However, many shipments now being received at WIPP have only two TRUPACT-IIs per shipment due to transportation weight restrictions. WIPP can therefore receive additional shipments up to the point that the number of TRUPACT-IIs reaches the weekly disposal capability limit of 51 TRUPACT-IIs. The current site shipment demand schedules indicate that weekly site shipment demand will exceed the 17 shipments per week beginning in January when the site shipment demand reflects 19 shipments per week. Weekly site shipment demands continue to climb during FY 2002 to a requested high of about 30 to 34 shipments per week at the end of FY 2002. The weekly average shipping demand for FY 2002 is over 25 shipments per week. Over 93 percent of the annual shipping demand results from two sites, INEEL and RFETS.

Under the current CBFO budget, shipments would be limited by the allocated transportation budget to 17 shipments per week. Following the direction of the National TRU Waste Corporate Board to assign shipment priority to INEEL and RFETS, available transportation resources would have been exclusively allocated to these sites to meet their shipping demand. However, the available shipping budget would still not accommodate the full shipping demand from both sites. The full shipping demand of one or the other could be met, but not both. Also, no other site would be able to ship. Shipments would continue to be limited by transportation constraints to 17 shipments per week.

As of January 7, 2002, the CBFO was provided the additional transportation funding to increase shipments to an intermediate shipping level of 25 shipments per week with two TRUPACT-IIs per shipment. The actions necessary to meet the 25 shipments per week goal are now proceeding. The additional funding (approximately $12.2M) provides

increased transportation and inspection costs and funds activities to enhance operational reliability at the WIPP (i.e., additional personnel and equipment). Assigning these shipment resources to INEEL and RFETS, then INEEL could average 10 shipments per week and RFETS could achieve 15 shipments per week. Other sites would be accommodated as transportation resources become available or as transportation resources may be re-allocated. Though this option did result in additional shipping capability, the INEEL was still limited in regard to reaching their commitment to the state of Idaho to remove 3,100 m^3 of TRU waste from the state by December 31, 2002. The additional funding also allows the CBFO to satisfy their commitment to RFETS to provide 120 TRUPACT-IIs per month for RFETS shipments and accommodate the goal of RFETS site closure in FY 2006.

Subsequent to the additional funding for achieving 25 shipments per week, the CBFO sought and received additional incremental funding to reach 30 shipments per week. This shipping increase allows RFETS to be sustained at 15 shipments per week (or 120 TRUPACTs per month) while increasing the shipping allowance for INEEL to about 15 shipments per week. Shipments from other sites would be accommodated on an as available basis. The increased shipment numbers allow a greater opportunity for INEEL to achieve their commitment to the state of Idaho to remove 3,100 m^3 of TRU waste from the state by December 31, 2002.

While much larger than the original expectations, these increased shipping rates still do not satisfy all site shipping needs. For example, shipments from SRS are not currently scheduled on a routine basis, but are scheduled as the availability of shipment resources allow. In order to ship TRU waste from the Mound Facility and support the planned closure of the Mound Facility, these shipments from SRS to WIPP must occur first. Delays in shipments of TRU waste from SRS to WIPP could therefore delay the planned closure of the Mound Facility. The current planning (as discussed in Chapter 3) is that after INEEL satisfies their 3,100 m^3 commitment during the first quarter of FY 2003 and prior to the startup of the Advanced Mixed Waste Treatment Facility at the end of the second quarter of FY 2003, SRS and other sites will be able to use the resources becoming available during this period to satisfy their shipping needs. The final allocation of transportation resources to support shipments from SRS will be made at the direction of the Corporate Board.

One other aspect of the increased shipment, receipt, and disposal rates is that RH TRU emplacement locations within the framework of the current room emplacement plan (i.e., the insertion of RH TRU canisters into boreholes in the room walls prior to emplacement of CH TRU in the rooms) are being covered by the emplacement of CH TRU. The number of available disposal locations will continue to increase as a function of the CH TRU emplacement rate, the initiation of RH TRU disposal, and the emplacement rate of RH TRU canisters. This is discussed in greater detail in Chapter 3 of this document. The impact on the number of available RH TRU disposal locations will continue to be evaluated as the CH and RH TRU programs proceed.

Even with the additional funding, the ability to satisfy the increased site shipment demand is forecast to be exceeded at times over the next several years. Even though RFETS will begin to reduce the number of shipments as they approach their cleanup goals and closure date, the Advanced Mixed Waste Treatment Facility (AMWTF) at INEEL will be increasing shipments during this period. Other sites will also need to ship. Shipment demand will therefore continue to increase and occasionally exceed shipment capabilities. During these periods, transportation resources and site shipment priorities will continue to be assigned by the National TRU Waste Corporate Board to achieve the overall goals of the National TRU Waste Program.

Appendix 1

Site-Specific Planning Summaries

APPENDIX 1 - SITE-SPECIFIC PLANNING SUMMARIES

Site-specific planning summaries, listed in alphabetical order, are contained in this appendix. This information documents the TRU waste sites' plans to reach the desired end state; specifically, the site's objectives, inventory, infrastructure, regulatory compliance, and shipping schedules. Information on issues and alternatives is also provided.

- TRU waste inventory data (i.e., stored and projected waste volumes) represent the best available information reported by the sites through the Integrated Planning, Accountability, and Budgeting System (IPABS). Additional needs, issues, and ideas are being identified from other sources, including reviews of site inventory data and follow-on discussions designed to fully understand the TRU waste inventory and the challenges associated with its final disposal. Each year, the most current data will be used for the annual update of the Plan. During the final preparations of this Plan, more detailed data are being collected to specifically address ongoing efforts to consolidate and/or close the small quantity sites. These data, as they apply to the Plan, will be reviewed for incorporation in next year's revision.

- The WIPP Supplemental Environmental Impact Statement (SEIS) II was performed based on a preferred alternative that included a 35-year operating period. The WIPP disposal phase is, therefore, assumed to end in FY 2034. Waste to be generated after FY 2034 has no current plan for disposal. Site-specific projected schedules for shipping volumes of TRU waste include shipments through FY 2070, the planning period covered by the IPABS.

- As used in the Plan, "infrastructure" refers to major elements of the basic framework required to retrieve, treat, repackage, characterize, and transport TRU waste.

The baseline plan is presented first; alternatives being proposed or pursued, if any, are then discussed. The level of detail reported is directly related to the amount of inventory on site, the site's infrastructure, and the Consent Orders/Agreements under which the site is regulated. A summary of all Consent Orders/Agreements milestones is presented in Table A1.29-1 at the end of this appendix. Data, in general, are based on IPABS-approved FY 2001 life-cycle planning data as of August 2001. The shipping data for FY 2002 and FY 2003, however, were supplied directly by the sites in response to a request for a two-year shipping forecast. The site's TRU program and TRU waste managers endorse the shipment schedules, assuming sufficient funds are available.

A1.1 - ARCO Medical Products Company, West Chester, PA

ARCO has 0.1 m^3 of CH TRU waste in the form of Pu-238- powered batteries in storage. This material has recently been consolidated at Los Alamos National Laboratory as part of the National Source Recovery Program. While at ARCO the material was categorized as TRU waste without a current plan for disposal since this small amount of inventory is identified as commercial waste and, as such, is not currently eligible for disposal at WIPP. No additional generation of CH TRU waste is projected. ARCO has no RH TRU waste inventory and none is projected. No Consent Orders/Agreements milestones exist for the site.

A1.2 - Argonne National Laboratory-East, Argonne, IL

Objectives

Argonne National Laboratory-East (ANL-E) plans to have its CH TRU waste characterized through the efforts of the Centralized Characterization Project. Program certification is anticipated to be received in July or August 2002 with shipments to WIPP commencing in September. The transportation corridor is planned to open in FY 2002, and the current inventory is planned to be shipped to WIPP for disposal by the end of FY 2002. ANL-E has a small volume of RH TRU waste planned for shipment between FY 2003 and FY 2007.

Inventory

ANL-E must manage the volumes of CH TRU and RH TRU waste listed in Table A1.2-1. An assessment of whether the waste has a clear path for disposal, a plan for disposal, or is without a current plan for disposal is also shown. Waste Without a Current Plan is generated after WIPP closure in FY 2034.

Table A1.2-1 - Volume of CH TRU and RH TRU Waste To Be Managed at ANL-E

	Stored (m^3)	Projected (m^3)	Total (m^3)	Clear Path (m^3)	Plan for Disposal (m^3)	Without a Current Plan (m^3)
CH	89	169	258	151	0	107
RH	2	8	10	0	10	0
Total	91	177	268	151	10	107

Infrastructure

As indicated above, ANL-E will use the characterization capabilities of Centralized Characterization Project to characterize their waste for disposal. Information regarding the site's planned infrastructure is listed in Table A1.2-2.

Table A1.2-2 - Planned Infrastructure at ANL-E

Function	Facility/Activity	Completed	In Process	Planned Start
CH Characterization	Centralized Characterization Project		X	2002
CH Transportation	Mobile Loading		X	2002
CH Certification	Certification Authority		X	2002
Transportation	Open Corridor		X	2002

Regulatory Compliance

ANL-E prepared a Site Treatment Plan in 1995 to comply with provisions of the Federal Facility Compliance Agreement. The Illinois Environmental Protection Agency is the regulator for mixed TRU waste. A Consent Order has not been issued. The State Attorney General has indicated that no enforcement action will be taken with respect to storing or generating mixed waste as long as the terms of the Site Treatment Plan are met.

Projected Shipping Schedules

Projected schedules for shipping volumes of CH TRU and RH TRU waste to WIPP for disposal are shown in Table A1.2-3. By the end of FY 2003, ANL-E will have shipped all legacy CH TRU waste. The RH TRU is expected to ship in FY 2005 via the 10-160B. The laboratory has ongoing missions that generate small quantities of waste. Rather than maintaining an open shipping corridor route over a prolonged period of time, shipping only a few shipments per year, ANL-E intends to accumulate newly generated waste until a shipping campaign is viable. A campaign is projected to begin in FY 2010 and occur every 5 to 10 years thereafter. ANL-E's last shipments to WIPP are scheduled in the FY 2026 through FY 2030 time frame.

Table A1.2-3 - Projected Schedules for Shipping Volumes of CH TRU and RH TRU Waste from ANL-E

Fiscal Year	CH TRU Volume (cubic meters)	CH TRU Number of Shipments	RH TRU Volume (cubic meters)	RH TRU Number of Shipments
2002	6	1	0	0
2003	51	8	0	0
2004	0	0	0	0
2005	0	0	8	4
2006	0	0	0	0
2007	0	0	2	1
2008	0	0	0	0
2009	0	0	0	0
2010	16	3	0	0
2011-2015	0	0	0	0
2016-2020	20	3	0	0
2021-2025	0	0	0	0
2026-2030	58	8	0	0
2031-2035	0	0	0	0
2036-2070	107*		0	

* This waste has no current plan for disposal because the WIPP disposal phase is projected to end in FY 2034.

Issues and Alternatives

Inventory

ANL-E expects to generate about 107 m^3 of CH TRU waste during the FY 2036 through FY 2070 time frame, after the scheduled closure of WIPP. This waste, which is without a current plan for disposal, will be stored in the Radioactive Waste Storage Facility and remain there until a suitable disposal plan is available.

The RH TRU waste can be shipped to WIPP after WIPP begins RH TRU waste disposal operations in FY 2003. ANL-E expects a total of 10 m^3 of RH TRU waste.

Associated Needs

Efforts are currently in progress to characterize the CH TRU waste at ANL-E through the Centralized Characterization Project discussed in Section 3.2.1.1. Mobile systems have been deployed at ANL-E and are expected to be certified in July or August 2002.

The infrastructure necessary for characterizing RH TRU waste and loading the waste into a shipping cask will need to be constructed. Mobile vendors for RH TRU processing are not available at this time; the technology is still under development.

A1.3 - Argonne National Laboratory-West, Idaho Falls, ID

Argonne National Laboratory-West (ANL-W) reports a small volume of CH TRU waste in storage (approximately 0.1 m^3) with an additional 8.2 m^3 to be generated. ANL-W also reports only 1.1 m^3 of RH TRU waste currently in storage with an additional 5.0 m^3 projected by the year 2009. These volumes are categorized as TRU waste with a plan for disposal. These wastes will be shipped from the INEEL. To address the RH TRU waste, ANL-W is designing the Remote Treatment Facility (RTF) Annex to segregate, characterize, treat, and repackage RH waste. As listed in Table A1.3-1, startup of the RTF is planned for 2009. A majority of this waste is currently stored in a silo-type complex. Of the 1,350 silos (approximately 0.5 m^3 of waste per silo), 600 will need to be interrogated for RH TRU waste. As characterization activities continue the projected amount of TRU waste could increase significantly over current projections. In addition, the permits for the silo area require the RTF Annex to be constructed to allow for a path forward for this RH TRU waste. Consent Orders/Agreements milestones for this site are listed in Table A1.29-1.

Table A1.3-1 - Planned Infrastructure at ANL-W

Function	Facility/Activity	Completed	In Progress	Planned Start
RH Segregation	ANL-W RTF			2009
RH Characterization	ANL-W RTF			2009
RH Repackaging	ANL-W RTF			2009
RH Treatment	ANL-W RTF			2009
RH Transportation	ANL-W RTF			2009

A1.4 - Babcock & Wilcox Nuclear Engineering Services, Lynchburg, VA

Babcock & Wilcox Nuclear Engineering Services, Lynchburg (B&W-NES) has 18.1 m^3 of CH TRU waste in storage. No additional generation of CH TRU waste is projected. The stored volume is categorized as TRU waste with a plan for disposal. There is no RH TRU waste inventory and no RH TRU waste is projected. B&W-NES may have some on-site capabilities for processing, characterizing, packaging, and shipping CH TRU waste. Since a defense determination has yet not been completed for this site, a clear decision for disposing of this waste at WIPP has not been made. If this waste is shown to be of defense origin, then this small inventory may make B&W-NES a candidate for the Centralized Characterization Project discussed in Section 3.2.1.1. No Consent Orders/Agreements milestones exist for this site.

A1.5 - Battelle Columbus Laboratories, Columbus, OH

Battelle Columbus Laboratories (BCL) is currently in the process of treating and repackaging stored waste. The BCL Decommissioning Project projects that 1.9 m^3 of CH TRU and 31.2 m^3 of RH TRU waste will be generated. These volumes are categorized as TRU waste with a plan for disposal. The DOE-Ohio Field Office's Strategic Plan requires that "any radioactive contamination associated with activities of the BCL prior to 1986 must be cleaned up by the end of 2005." The schedule for closure at the West Jefferson Site requires BCL to begin shipping RH TRU waste by early calendar year 2001 to support the 2005 committed closure date; waste must be removed to allow characterization, decontamination, and demolition of site buildings. Since WIPP is not scheduled to begin receiving RH TRU waste until FY 2005, it will be necessary to ship the BCL RH TRU waste to a temporary storage location with subsequent shipment to WIPP for disposal. Based on a recently completed Memorandum of Agreement, the BCL waste will be transported to the Hanford Reservation for subsequent shipment to WIPP after the initiation of RH TRU waste disposal.

A1.6 - Bettis Atomic Power Laboratory, West Mifflin, PA

Bettis Atomic Power Laboratory (BAPL) has 18.6 m^3 of CH TRU waste in storage. No additional generation of CH TRU waste is projected. The laboratory has 2.0 m^3 of RH TRU in storage with no additional generation of RH TRU waste projected. The stored volumes are categorized as TRU waste with a plan for disposal. BAPL, as a small-quantity generator without a WIPP TRU waste characterization infrastructure, is a candidate for the CH TRU waste Centralized Characterization Project discussed in Section 3.2.1.1. No Consent Orders/Agreements milestones exist for this site.

A1.7 - Energy Technology Engineering Center, Santa Susana, CA

The Energy Technology Engineering Center (ETEC) has 2.3 m^3 of CH TRU waste and 11.0 m^3 of RH TRU waste in storage. These volumes are categorized as TRU waste with a plan for disposal. No additional generation of waste is projected. The DOE and Boeing Canoga Park, the management and operating contractor for the ETEC, have signed an agreement to close the site in 2007. Removal of all TRU waste by October 2002 is required in order to meet this closure date. The ETEC's CH TRU waste is a candidate for characterization under the Centralized Characterization Project discussed in Section 3.2.1.1. Current expectations are that the ETEC's RH TRU waste will be able to comply with final WIPP RH WAP and the site will ship its RH TRU waste to WIPP in FY 2005. A contingency position may be to send the RH TRU waste to a large-quantity site (such as the Hanford Reservation) for temporary storage and subsequent characterization and certification for disposal. The two Consent Orders/Agreements milestones for this site are listed in Table A1.29-1.

A1.8 - General Electric Vallecitos Nuclear Center, Pleasanton, CA

The General Electric Vallecitos Nuclear Center (GE-VNC) reports no stored CH TRU inventory though they expect to generate about 20 m^3 in the future. GE-VNC estimates a stored RH TRU waste inventory of 11.8 m^3. No additional generation of waste is projected. Since a defense determination has yet not been completed for this site, a clear decision for disposing of this waste at WIPP has not been made. If this waste is shown to be of defense origin, then the small inventory of CH TRU waste and the lack of waste characterization infrastructure make GE-VNC a candidate for the Centralized Characterization Project discussed in Section 3.2.1.1. No Consent Orders/Agreements milestones exist for this site.

A1.9 - Hanford Reservation, Richland, WA

Objectives

Through the end of FY 2001 and as of December 31, 2001, a total of ten shipments with a volume of 80.4 m^3 have been received at WIPP. The first shipment of RH TRU waste is now scheduled during the FY 2011 and FY 2015 time period. Shipments of both CH and RH TRU waste will continue until WIPP's expected closing date in FY 2034.

Inventory

Hanford must manage the volumes of CH TRU and RH TRU waste listed in Table A1.9-1. An assessment of whether the waste has a clear path for disposal, has a plan for disposal, or is without a current plan for disposal is also shown.

Table A1.9-1 - Volume of CH TRU and RH TRU Waste To Be Managed at Hanford (1)

Waste Type	Stored (m^3)	Projected (m^3)	Total (m^3)	Clear Path (m^3)	Plan for Disposal (m^3)	Without a Current Plan (m^3)
CH	16,100	16,200	32,300	23,900	8,400 (2)	80
RH	210	940	1,150	0	1,150	0
Total	16,300	17,000	33,400	23,900	9,550	80

(1) Numbers rounded to nearest hundred or ten.

(2) Includes 258 m^3 of waste containing PCBs and 2 m^3 of waste with high Pu-238 activity.

Infrastructure

The Waste Receiving and Processing (WRAP) facility is currently being used to characterize and process TRU waste for shipment to WIPP. However, the WRAP facility will not be able to handle all of the repackaging needs for the Hanford Reservation. A large box facility will be constructed or an existing facility will be modified; operations are planned to begin in FY 2013. This facility will size-reduce large

containers containing both CH TRU and RH TRU waste. Alternatively, a large container packaging (referred to as the TRUPACT-III) is being developed by CBFO to address the issue with oversize waste containers. The TRUPACT-II loading facility for Hanford is located inside the WRAP facility. The infrastructure for RH TRU waste processing needs to be constructed. Hanford's transportation corridor is currently open for shipping waste to WIPP. Information regarding the site's existing and planned infrastructure is listed in Table A1.9-2.

Table A1.9-2 - Existing and Planned Infrastructure at Hanford

Function	Facility/Activity	Completed	In Process	Planned Start
CH Retrieval	Retrieval		X	
RH Retrieval	Alpha Caisson Retrieval			2014
CH Characterization	Waste Receiving and Processing	X		
CH/RH Repackaging	CH/RH Large Box Facility			2013
RH Characterization	Processing Facility			2013
CH Transportation	Loading Facility	X		
RH Transportation	Loading Facility			2013
Certification	Certification Authority	X		
Transportation	Open Corridor	X		

TRU waste at Hanford is stored at either the Central Waste Complex or in the 200 Area burial grounds. TRU waste that is currently in the 200 Area burial grounds must be retrieved before it can be characterized and sent to WIPP for disposal. Initial retrieval of the TRU waste in the burial grounds started in FY 1999 and is scheduled to be completed in FY 2004.

TRU waste contained in a burial ground not located in the 200 Area is to be retrieved as part of the Central Plateau Program. These burial grounds, known as 618-10 and 618-11, have retrieval start dates during the FY 2011 and FY 2015 time period.

Waste retrieved during the initial phase of the TRU waste retrieval activities will be placed in aboveground storage, or disposed of at WIPP. A new processing facility (M-91) planned for RH TRU and mixed RH TRU will be in the final design and initial construction stages in FY 2012. Processing of RH TRU wastes will begin in FY 2014. The WRAP facility will continue to be operated and maintained. Processing equipment and computer interface equipment will be upgraded, as necessary, to meet throughput requirements. The WRAP facility will continue processing CH post-1970 TRU/TRU mixed waste from the following anticipated waste streams: newly generated on site; retrieved suspect TRU; and possibly off-site TRU waste requiring WIPP certification.

Regulatory Compliance

Because of other existing agreements, Hanford was not required to prepare a Site Treatment Plan to comply with provisions of the Federal Facility Compliance Agreement. Regulatory agreements for the Hanford Reservation are established by the Hanford Tri-Party Agreement among the DOE, the Environmental Protection Agency, and the State of Washington. The regulator for the hazardous waste constituents of the mixed TRU waste at Hanford is the Washington State Department of Ecology. The Tri-Party Agreement establishes the following milestones associated with TRU and mixed TRU waste (completed milestones are preceded by a check mark [/]).

/ Initiate processing of CH TRU/mixed TRU waste at the Waste Receiving and Processing Facility by December 1998.

/ Submit Hanford Site TRU/mixed TRU waste project management plan to Washington State Department of Ecology by June 2000

/ Complete construction of small-container CH TRU/mixed TRU waste retrieval facility (Project W-113) and initiate retrieval of small-container TRU/mixed TRU waste from the 200 Area by September 2000.

C Award necessary privatized contracts for processing RH TRU and large-size TRU/mixed TRU waste by September 2003.

C Complete retrieval of post-1970 CH TRU/mixed TRU waste associated with project W-113 by September 2004.

C Complete construction and initiate operations of RH TRU and large-size TRU/mixed TRU waste by June 2005.

The Tri-Party Agreement milestones for RH TRU waste are currently being discussed. A proposed revision was included in the Project Management Plan submitted to the Washington Department of Ecology and the EPA in June 2000.

Projected Shipping Schedules

Projected schedules for shipping volumes of CH TRU and RH TRU waste to WIPP for disposal are shown in Table A1.9-3. *Quantities reflect any volumetric expansion or reduction that would occur during waste processing.*

Table A1.9-3 - Projected Schedules for Shipping Volumes of CH TRU and RH TRU Waste from Hanford

Fiscal Year	CH TRU Volume (cubic meters)	CH TRU Number of Shipments	RH TRU Volume (cubic meters)	RH TRU Number of Shipments
Disposed	80	10	0	0
2002	0	0	0	0
2003	84	10	0	0
2004	120	14	0	0
2005	140	17	0	0
2006	200	24	0	0
2007	280	38	0	0
2008	500	68	0	0
2009	750	102	0	0
2010	900	122	0	0
2011-2015	4,120	441	40	48
2016-2020	4,870	472	290	327
2021-2025	4,870	460	350	394
2026-2030	4,860	445	320	360
2031-2035*	1,910	169	50	51
2036-2070	80**		0	

* Although IPABS data are presented in five-year increments, it is assumed that all waste will be shipped to WIPP during FY 2031 through FY 2034.

** This waste has no current plan for disposal because the WIPP disposal phase is projected to end in FY 2034.

Issues and Alternatives

Inventory

Based on the current IPABS data, Hanford expects to generate only 75 m^3 of CH TRU waste during the FY 2036 through FY 2070 time frame, after WIPP is scheduled for closure. This waste, which would have no plan for disposal, would be stored until a suitable disposal plan is available.

Associated Needs

Of the waste that cannot be disposed of without overcoming associated needs, 8,400 m^3 will require processing that is not currently available at the site. Hanford has no current processing capability for large CH TRU containers (7,000 m^3), for high Pu-238 activity (2 m^3), and for RH TRU waste (1,150 m^3). The particular processing capabilities that are lacking are RH assay, remote processing for nondestructive examination, size reduction, visual examination, packaging, and headspace gas sampling for RH TRU waste. Hanford expects to modify existing facilities in FY 2013 to

accommodate these processes (as needed to meet the WIPP RH WAC upon issuance). The site also has 73 m^3 of TRU waste that has PCBs greater than 50 ppm in current storage with the expectation of an additional 185 m^3.

A1.10 - Idaho National Engineering and Environmental Laboratory, Idaho Falls, ID

Objectives

The first shipment of CH TRU waste from the Idaho National Engineering and Environmental Laboratory (INEEL) to WIPP was made in April 1999. Through FY 2001, 137 shipments were made with a disposed volume of 819 m^3. As of December 31, 2001, a total of 170 shipments with a volume of 1019 m^3 has been received at WIPP. Shipments are scheduled to be completed during the FY 2011 through FY 2015 time frame. INEEL plans to send its first shipment of RH TRU waste in FY 2009. Shipments of RH TRU waste will be completed in the FY 2016 through FY 2020 interval.

Inventory

INEEL must manage the volumes of CH TRU and RH TRU waste listed in Table A1.10-1. An assessment of whether the waste has a clear path for disposal, has a plan for disposal, or is without a current plan for disposal is also shown.

Table A1.10-1 - Volume of CH TRU and RH TRU Waste To Be Managed at INEEL

Waste Type	Stored (m^3)	Projected (m^3)	Total (m^3)	Clear Path (m^3)	Plan for Disposal (m^3)	Without a Current Plan (m^3)
CH	66,700	31,300	98,000	2,200	95,800 (1)	26
RH	84	620	700	0	700	0
Total	66,800	31,900	98,700	2,200	96,500	26

(1) Waste processed without segregation into TRU waste and LLW

Infrastructure

INEEL is targeting retrieval of waste from accessible storage for early certification and shipment to WIPP to meet an upcoming milestone specified in the Laboratory's Settlement Agreement with the State of Idaho. By December 31, 2002, no fewer than 3,100 m^3 (approximately 15,000 55-gallon drum equivalents) of TRU waste must be shipped out of the State of Idaho. This waste is being characterized at the Stored Waste Examination Pilot Plant (SWEPP), the Analytical Chemistry Laboratory (ACL), Environmental Chemistry Laboratory (ECL), and at ANL-W. These facilities are used for RCRA solids analysis and head space gas (HGS) analysis. Additional TRUPACT-II loading capability was added in FY 2001, with a maximum of two loading areas operating multiple shifts.

After meeting the milestone, the remaining CH TRU waste will be treated in the Advanced Mixed Waste Treatment Facility (AMWTF). The AMWTF will be constructed

and be in operation by March 31, 2003, as required by the Settlement Agreement. This facility is being financed and operated by the private sector. It has sufficient processing capacity to accommodate additional waste volumes from across the DOE TRU waste system.

The design of the AMWTF will not allow for the processing of RH TRU waste. The INEEL is evaluating a strategic approach to implementing RH TRU characterization, certification, and transportation capabilities. The INEEL is evaluating acceleration of the baseline for initiating disposal of stored RH TRU waste. INEEL began RH TRU waste retrieval in August 2000. RH TRU visual examination/repackaging operations (if needed) are expected to be implemented in an existing facility that will be modified for that purpose.

Information regarding the site's existing and planned infrastructure is listed in Table A1.10-2.

Table A1.10-2 - Existing and Planned Infrastructure at INEEL

Function	Facility/Activity	Completed	In Process	Planned Start
CH Characterization	SWEPP		X	
CH Characterization	ANL-W		X	
CH Characterization	ACL		X	
CH Characterization	ECL		X	
RH Characterization	RH TRU Repackaging			TBD
CH Treatment	AMWTF		X	March 2003
CH Transportation	TRUPACT-II Loading Facility	X		
Transportation	Expand TRUPACT-II Loading Capability	X		
Transportation	Open Corridor	X		
Certification	Certification Authority - Debris waste forms	X		
Certification	Certification Authority - Nondebris waste forms	X		

Regulatory Compliance

Regulatory drivers for the INEEL originate from two primary sources. The first source is a settlement agreement among the State of Idaho, the U.S. Department of the Navy, and the DOE that is administered by the State of Idaho Oversight Program. The second source is a Federal Facility Compliance Agreement Consent Order and Site Treatment Plan that was jointly issued in 1995 by the DOE and the Idaho Department of Health and Welfare, Division of Environmental Quality, and is administered by the latter. The following key milestones have been derived from these sources (completed milestones are preceded by a check mark [/]).

/ Place contract for the construction of an AMWTF for the treatment of TRU wastes.

/ Initiate shipments of TRU waste to WIPP, or other such facility designated by the DOE, by April 30, 1999.

C By December 31, 2002, ship no fewer than 3,100 m^3 (approximately 15,000 55-gallon drum equivalents) of TRU waste out of the State of Idaho.

C Complete construction of the AMWTF by December 31, 2002.

C Begin operation of the AMWTF by March 31, 2003.

C After January 1, 2003, remove no less than a 2,000 m^3 per year running average of TRU waste out of the State of Idaho.

C Ship all TRU waste to WIPP, or other such facility designated by the DOE, by a target date of December 31, 2015, and in no event later than December 31, 2018.

The impact of not meeting these milestones is suspension of DOE spent fuel shipments to the INEEL. The sole storage facility for Department of Defense spent nuclear fuel is currently at the INEEL. Suspending those shipments could severely impact the U.S. Department of Defense Nuclear Program.

Projected Shipping Schedules

Projected schedules for shipping volumes of CH TRU and RH TRU waste to WIPP for disposal are shown in Table A1.10-3. *The quantities reflect any volumetric expansion or reduction that would occur during waste processing.*

Table A1.10-3 - Projected Schedules for Shipping Volumes of CH TRU and RH TRU Waste from the INEEL

Fiscal Year	CH TRU Volume (cubic meters)	CH TRU Number of Shipments	RH TRU Volume (cubic meters)	RH TRU Number of Shipments
Disposed	819	137	0	0
2002	2,758	510	0	0
2003	2,000	395	0	0
2004	4,500	900	0	0
2005	5,700	1,140	0	0
2006	5,700	1,140	0	0
2007	5,700	1,140	0	0
2008	5,700	1,140	0	0
2009	2,790	558	18	20
2010	1,680	336	43	48
2011-2015	3,210	642	1,020	1,143
2016-2020	0	0	95	107
2021-2025	0	0	0	0
2026-2030	0	0	0	0
2031-2035	0	0	0	0
2036-2070	0		0	

Issues and Alternatives

Inventory

The INEEL has initiated a detailed assessment of individually stored TRU waste streams to identify those that cannot be disposed of at WIPP. The site estimates that 26 m^3 of nondefense TRU waste currently cannot be disposed of at WIPP. Potential management or disposal plans will be determined for wastes not acceptable at WIPP based on the disposition map available at the end of FY 2000. Additional activities are being performed to ensure all stored legacy TRU waste is removed from Idaho by December 31, 2018, as required by the Settlement Agreement.

Associated Needs

DOE plans to ship the final post-processing volumes resulting from addressing this 95,900 cubic meters after the associated needs are addressed:

- TSCA-regulated (PCB-contaminated) waste (1,575 m^3)*: Includes pre-1980 machining oils from Rocky Flats Environmental Technology Site;

- High thermal wattage (804 m^3);
- Processing in the AMWTF, which is scheduled for operation in March 2003 (88,000 m^3). (The amount of waste processed through the AMWTF is dependent on the final AMWTF waste acceptance criteria. Some waste may be LLW and some may require alternative treatment.);
- Facility modification required for examination, characterization, and shipping equipment and procedures (85 m^3);
- Defense non-TRU (but managed as TRU) wastes (419 m^{3*}): Includes Bettis Atomic Power Laboratory waste that is contaminated with U-233; and
- Waste Incidental to Reprocessing (5,000 m^3): Waste currently in the Idaho Nuclear Technology and Engineering Center program that is expected to be TRU waste after processing. Though currently identified as CH TRU, a portion of this waste may be classified as RH TRU.

The AMWTF is being designed so that several of these associated needs (indicated by an asterisk [*]) will be addressed through processing. Processing of other streams (e.g., waste from other sites or waste derived from environmental restoration activities) is possible with modification to the private sector contract.

A1.11 - Knolls Atomic Power Laboratory, Niskayuna, NY

Knolls Atomic Power Laboratory (KAPL) – Niskayuna, NY currently has 3.1 m^3 of RH TRU waste on-hand. This is based on its current, as generated configuration prior to characterization and packaging for shipment. This volume is categorized as TRU waste with a plan for disposal. KAPL also projects a continued net generation of RH TRU at an estimated rate of 0.2 m^3/year as a result of its on-going operational mission (approximately 6.8 m^3 projected). No CH TRU waste or mixed TRU waste is currently in storage; however, small quantities may be generated as a result of repackaging RH TRU waste for shipment. No Consent Orders/Agreements milestones exist for this waste. KAPL plans to use mobile vendor options for RH TRU (as they become available) for characterization and subsequent disposal of this waste.

A1.12 - Knolls Atomic Power Laboratory-Nuclear Fuel Services, Inc. (KAPL-NFS), Erwin, TN

The Naval Nuclear Propulsion Program, a joint DOE/Navy Program, is responsible for decommissioning of retired facilities at Nuclear Fuel Services, Inc. (NFS) of Erwin, TN. NFS has provided and still provides nuclear fuel materials for naval nuclear propulsion plants. KAPL assists in fulfillment of government responsibilities for this decommissioning work. TRU waste for this site is listed as KAPL-NFS. KAPL-NFS currently has 30 m^3 of CH TRU waste in storage and projects that an additional 183 m^3 will be generated over the next 4 years. These volumes are categorized as TRU waste with a plan for disposal. As a small-quantity site without final WIPP TRU waste

characterization infrastructure, KAPL-NFS is a candidate for the CH TRU waste Centralized Characterization Project discussed in Section 3.2.1.1. KAPL-NFS has no RH TRU waste inventory and none is projected. No Consent Orders/Agreements milestones exist for this waste.

A1.13 - Lawrence Berkeley National Laboratory, Berkeley, CA

Lawrence Berkeley National Laboratory (LBNL) has 1.7 m^3 of CH TRU waste in storage and expects to generate an additional 0.5 m^3 of CH TRU. This waste has not been designated as defense-generated waste and, therefore, is not currently acceptable at WIPP. No Consent Orders/Agreements milestones exist for this site.

A1.14 - Lawrence Livermore National Laboratory, Livermore, CA

Objectives

Lawrence Livermore National Laboratory (LLNL) plans to have its waste characterization process certified during FY 2002. The first shipment may not occur till FY 2004. The LLNL's last shipments to WIPP are scheduled in the FY 2031 through FY 2035 interval.

Inventory

The LLNL must manage the volume of CH TRU waste listed in Table A1.14-1. An assessment of whether the waste has a clear path for disposal, has a plan for disposal, or is without a current plan for disposal is also shown. The long-term mission of LLNL results in the continuing annual generation of TRU waste after FY 2034. The LLNL has no RH TRU waste in storage and does not plan to generate RH TRU waste.

Table A1.14-1 - Volume of CH TRU Waste To Be Managed at LLNL

	Stored (m^3)	Projected (m^3)	Total (m^3)	Clear Path (m^3)	Plan for Disposal (m^3)	Without a Current Plan (m^3)
CH	290	1,400	1,690	440	550	700
RH	0	0	0	0	0	0
Total	290	1,400	1,690	440	550	700

Infrastructure

The LLNL will use a combination of fixed facilities and mobile capabilities for waste processing to accommodate its shipping schedules. Fixed facilities will be used for statistical sampling of homogeneous waste, and radioassay of newly generated drums. Mobile units will be used to perform headspace gas analysis, repackaging operations, visual verification of real-time radiography results, and loading of TRUPACT-IIs. The infrastructure to radioassay standard boxes needs to be developed. Characterization of

waste in drums and standard waste boxes is under way on a limited scale. Large boxes are expected to be transported to the WIPP for disposal in TRUPACT-IIIs, thereby eliminating the requirement for repackaging of most boxes.

Information regarding the site's existing and planned infrastructure is listed in Table A1.14-2.

Table A1.14-2 - Existing and Planned Infrastructure at LLNL

Function	Facility/Activity	Completed	In Process	Planned Start
Characterization	Assay/Visual Examination (Building 332)	X		
Characterization	Mobile Characterization		X	
Processing/ Repackaging	Decontamination and Waste Treatment Facility		X	FY 2002
Transportation	Open Corridor			1st Quarter FY 2003

Regulatory Compliance

The LLNL prepared a Site Treatment Plan in 1995 to meet its requirements under the Federal Facility Compliance Agreement. A consent order was issued by the State of California's Department of Toxic Substances Control in 1997 to address mixed TRU waste. The Site Treatment Plan and associated Consent Order establish two milestones regarding mixed TRU waste, both of which have been completed (completed milestones are preceded by a check mark [/]).

/ Establish a schedule for completing characterization of mixed TRU waste by September 30, 1996.

/ Establish a schedule for shipping mixed TRU waste to WIPP by December 31, 1998.

Projected Shipping Schedules

Projected schedules for shipping volumes of CH TRU waste to WIPP for disposal are shown in Table A1.14-3. *The quantities reflect any volumetric expansion or reduction that would occur during waste processing*.

Table A1.14-3 - Projected Schedules for Shipping Volumes of CH TRU Waste from LLNL

Fiscal Year	CH TRU Volume (cubic meters)	CH TRU Number of Shipments
2002	0	0
2003	0	0
2004	160	22
2005	0	0
2006	0	0
2007	170	23
2008	0	0
2009	30	4
2010	30	4
2011-2015	100	14
2016-2020	100	14
2021-2025	100	14
2026-2030	100	14
2031-2035*	100	14
2036-2070	700**	

* Although IPABS data are presented in a five-year increment, it is assumed that all waste will be shipped to WIPP during FY 2031 through 2034.

** This waste has no current plan for disposal because the WIPP disposal phase is projected to end in FY 2034.

Issues and Alternatives

Inventory

The LLNL expects to generate 700 m^3 of CH TRU waste after the scheduled closure of WIPP. This waste, which would have no current plan for disposal, would be stored until a suitable disposal path is available.

Associated Needs

The LLNL expects to have 550 m^3 of TRU waste that is acceptable at WIPP after addressing associated needs. The majority of the needs are related to equipment and infrastructure that are not currently available. New facilities will be needed for box assay and visual examination. Box repackaging is not expected to be required since it is anticipated that most boxes will be transportable in the new TRUPACT-III. An existing facility will need to be modified for gas generation testing. Estimated dates for construction and operation of these facilities have not been determined.

The LLNL plans to secure mobile characterization vendors through the Centralized Characterization Project discussed in Section 3.2.1.1.

The LLNL TRU waste shipping schedule discussed above is based on the underlying assumption that there are no associated needs that would prevent or otherwise delay disposal. However, as shown in Table A1.14-1, 550 m^3 cannot be disposed of until certain needs are addressed, and 700 m^3 have no current plan for disposal because the waste will be generated after the expected closing date of WIPP.

A1.15 - Los Alamos National Laboratory, Los Alamos, NM

Information on the FY 2002/FY 2003 shipping schedules was provided by the Los Alamos National Laboratory (LANL) in conjunction with the data supplied in IPABS.

Objectives

LANL received certification of its waste processing facilities in September 1997. The site sent its first shipment of CH TRU waste to WIPP in March 1999. Through FY 2001, LANL shipped 24 shipments with a total volume of 263.4 m^3. As of December 31, 2001, a total of 25 shipments with a total volume of 271 m^3 had been received at WIPP. LANL will continue to ship CH TRU waste through FY 2034. The site's shipments of RH TRU waste are scheduled during the FY 2011 through FY 2015 interval.

Inventory

LANL must manage the volumes of CH TRU and RH TRU waste listed in Table A1.15-1. LANL's defense TRU waste packaged in drums will be disposed though repackaging is expected to result in significant volume expansion to meet transportation wattage limits. LANL's TRU waste packaged in crates will be primarily disposed of as compacted LLW. An unknown number of drums of compacted waste may be disposed as TRU waste.

Table A1.15-1 - Volume of CH TRU and RH TRU Waste To Be Managed at LANL[1]

Waste Type	Stored (m^3)	Projected (m^3)	Total (m^3)	Clear Path (m^3)	Plan for Disposal (m^3)	Without a Current Plan (m^3)
CH	9,300	10,800	20,100	13,160	1,580 (32,370) [2]	5,360
RH	98	24	122	0	118 [3]	4
Total	9,400	10,800	20,200	13,160	1,700 (32,490) [2]	5,360

[1] Includes stored and projected volumes from LRRI and SNL which will be sent to LANL for packaging prior to shipment to WIPP.

[2] Adjusting volumes for estimated volume expansion due to repackaging necessitated by high wattage considerations result in the estimated volume in parentheses for the CH TRU volume shown.

[3] Plan for disposal depends on the final RH WAC and WAP.

Infrastructure

LANL will use both mobile and fixed facilities to accommodate required waste processing schedules. Waste stored on Pads 1, 2, and 4 will be retrieved and placed in storage that meets RCRA standards before undergoing certification. Waste in oversized boxes are expected to be shipped in the TRUPACT-III. Drummed waste is being processed currently through a waste characterization string comprised of mobile units supplemented with operations performed in the Radioassay and Nondestructive Testing Facility and the Waste Characterization, Reduction, and Repackaging Facility. An additional facility for repackaging, core analysis, and hydrogen gas generation testing is expected to open within the next year. Radioassay of standard waste boxes will be performed in a planned box assay system scheduled to begin operation in FY 2002. Loading of CH TRU waste into TRUPACT-IIs will be performed in the Radioassay and Nondestructive Testing Facility.

Regulatory Compliance

LANL prepared a Site Treatment Plan in 1995 to comply with provisions of the Federal Facility Compliance Agreement. In response to the Site Treatment Plan, the New Mexico Environment Department (NMED) issued a Compliance Order regarding regulation of mixed TRU waste at LANL. The Order did not assume that WIPP would open as scheduled or receive an exemption for disposing of mixed waste without treatment to RCRA land disposal treatment standards. For this reason, provisions are in the Order that require development of treatment technologies for mixed TRU waste and submission of a treatment permit application to the NMED. Treatment of mixed TRU waste would begin within 6 months of issuance of the treatment permit and would be finished by December 31, 2010. With the opening of WIPP, certain provisions of the Compliance Order were no longer applicable. A second Compliance Order also required that the waste on Storage Pads 1, 2, and 4 be brought into compliance with

RCRA mixed waste storage standards. This work is ongoing and will be finished on a schedule to comply with the Order.

Projected Shipping Schedules

Projected schedules for shipping volumes of CH TRU and RH TRU waste to WIPP for disposal are shown in Table A1.15-2. *The quantities reflect any volumetric expansion or reduction that would occur during waste processing*.

Table A1.15-2 - Projected Schedules for Shipping Volumes of CH TRU and RH TRU Waste from LANL

Fiscal Year	CH TRU Volume (cubic meters)	CH TRU Number of Shipments	RH TRU Volume (cubic meters)	RH TRU Number of Shipments
Disposed	263	24	0	0
2002	140	16	0	0
2003	540	62	0	0
2004	660	79	0	0
2005	530	62	0	0
2006	540	63	0	0
2007	590	68	0	0
2008	540	63	0	0
2009	440	52	0	0
2010	400	47	0	0
2011-2015	1,970	228	120	136
2016-2020	3,290	378	0	0
2021-2025	1,760	204	1	2
2026-2030	1,820	211	0	0
2031-2035*	1,150	134	1	2
2036-2070	5,290**		0	

* Although IPABS data are presented in a five-year increment, it is assumed that all waste will be shipped to WIPP during FY 2031 through 2034.

** This waste has no current plan for disposal because the WIPP disposal phase is projected to end in FY 2034.

Issues and Alternatives

Inventory

Management of TRU waste will continue in support of ongoing LANL mission requirements. New missions under defense programs are estimated to generate about 150 m^3 per year after FY 2034.

Approximately 1,580 m^3 of legacy waste may need to be repackaged due to the need to reduce existing high wattage conditions. If repackaged, this waste is estimated to increase in volume to 32,370 m^3. The shipping schedule shown above is based on the assumption that such repackaging will not be necessary due to either regulatory relief, such as the acceptance by the NRC of a reduced TRUPACT-II closure and transit time, or other technological changes.

TRU waste is assumed to be generated at the same estimated annual rate of generation beyond the scheduled closure of WIPP. Therefore, about 5,292 m^3 of TRU waste is estimated to be generated after the scheduled closure of WIPP between FY 2036 and FY 2070 and, therefore, does not have a current plan for disposal. Another 42 m^3 is estimated to be generated off-site and shipped to LANL after the scheduled closure of WIPP. About 27 m^3 is now considered nondefense TRU waste. Nondefense TRU waste will remain in storage until the DOE develops a disposal capability for this waste.

A1.16 - Lovelace Respiratory Research Institute, Albuquerque, NM

The Lovelace Respiratory Research Institute (LRRI) currently stores 0.3 m^3 of CH TRU waste. LRRI expects to generate an additional 14.0 m^3 of CH TRU waste through the FY 2034 time frame. This volume is categorized as waste with a clear path for disposal. TRU waste generated at LRRI is picked up by Sandia National Laboratories for storage, repackaging, and shipment to LANL for subsequent disposal at WIPP.

A1.17 - Missouri (University of) Research Reactor, Columbia, MO

The Missouri (University of) Research Reactor (MURR) has 1.4 m^3 of CH TRU waste in storage. This volume is categorized as TRU waste with a plan for disposal. No additional CH TRU waste is projected. This small inventory and the lack of waste characterization infrastructure make MURR a candidate for the Centralized Characterization Project discussed in Section 3.2.1.1. MURR has no RH TRU waste inventory; none is projected. No Consent Orders/Agreements milestones exist for the site.

A1.18 - Mound Laboratory, Miamisburg, OH

The Mound Laboratory waste is predominately contaminated with Pu-238 and cannot currently be economically transported inside TRUPACT-II (see Section 2.3.1.7, High Wattage Waste). Since the waste is similar to waste at the Savannah River Site (SRS) in regard to its Pu-238 content, the DOE has negotiated an arrangement with the State of South Carolina to allow the Mound waste to be shipped to SRS for subsequent characterization and shipment to WIPP. The Mound waste will be transported by refurbished ATMX railcars (referred to as OHOX railcars) to the SRS. DOE has been granted an exemption by the Department of Transportation to use the OHOX railcars for a limited number of shipments through May 2002. This exemption has recently been extended to November 30, 2003. In exchange, a volume of SRS TRU waste equivalent to two times that received from Mound must be removed from SRS. The SRS waste is being certified by mobile characterization vendors as the first trial of the Centralized Characterization Program (see Section 3.2.1.1, Schedule Issues).

Objectives

The Mound Laboratory plans to have its current CH TRU inventory shipped to the SRS during FY 2001 and FY 2003. A total of ten shipments using the OHOX railcars are expected. The site plans no further generation of CH TRU waste. The site has no RH TRU waste in storage and does not plan to generate RH TRU waste. Mound Laboratory is scheduled for closure by the end of FY 2004.

Inventory

Mound estimates it has about 247 m^3 of CH TRU waste in storage. Table A1.18-1 shows an assessment of whether the waste has a clear path for disposal, has a plan for disposal, or is without a current plan for disposal is also shown.

Table A1.18-1 - Volume of CH TRU Waste To Be Managed at Mound

Waste Type	Stored (m^3)	Projected (m^3)	Total (m^3)	Clear Path (m^3)	Plan for Disposal (m^3)	Without a Current Plan (m^3)
CH	247	0	247	0	247	0
RH	0	0	0	0	0	0
Total	247	0	247	0	247	0

Infrastructure

TRU Waste will be characterized to DOT pretransport specifications and then stored in T Building until it is prepared for shipment to SRS.

Information regarding the site's planned infrastructure is listed in Table A1.18-2.

Table A1.18-2 - Planned Infrastructure at Mound

Function	Facility/Activity	Completed	In Process	Planned Start
Characterization	Centralized Characterization Project		X	FY 2002
Certification	Certification Authority		X	FY 2002
Transportation	Open Corridor	X		

Regulatory Compliance

The Mound Plant prepared a Site Treatment Plan for addressing its mixed TRU waste inventories. The plan assumes ultimate disposal of this waste at WIPP. The Mound Plant was placed on the CERCLA National Priorities List in 1989, and the DOE has entered into agreements with the Ohio Environmental Protection Agency to develop a cleanup strategy. The DOE has committed to relinquishing its facility to the city of Miamisburg by the end of 2004.

Projected Shipping Schedules

All CH TRU waste at Mound will be shipped to SRS during FY 2001 and FY 2002.

Issues and Alternatives

Inventory

Mound also has approximately 3 liters of 17 percent PCB-contaminated waste that is not included in the inventory volume needing treatment.

Associated Needs

Up to ten shipments are allowed in the OHOX railcar in accordance with the DOT exemption. The SRS plans to build a repackaging facility to handle its own waste that could also be used for the Mound waste. Shipments from Mound to the SRS will begin in late-FY 2001. The SRS will store the waste temporarily until SRS has the capability to repackage the waste for shipment to WIPP.

A1.19 - Nevada Test Site, Mercury, NV

Objectives

The Nevada Test Site (NTS) plans to have its waste characterization process certified by the first quarter of FY 2003 and send its first shipment of CH TRU waste to WIPP during the second quarter of FY 2003. The site's last shipments to WIPP are scheduled in FY 2009.

Inventory

The NTS must manage the volumes of CH TRU waste listed in Table A1.19-1. An assessment of whether the waste has a clear path for disposal, has a plan for disposal, or is without a current plan for disposal is also shown. The site has no RH TRU waste in storage and does not plan to generate RH TRU.

Table A1.19-1 - Volume of CH TRU and RH TRU Waste To Be Managed at NTS

Waste Type	Stored (m^3)	Projected (m^3)	Total (m^3)	Clear Path (m^3)	Plan for Disposal (m^3)	Without a Current Plan (m^3)
CH	500*	200	700	0	590	80
RH	0	0	0	0	0	0
Total	500*	200	700	0	590	80

* Includes 54 m^3 of classified TRU material.

Infrastructure

The TRU/Mixed TRU Project manages the storage and characterization of TRU and mixed TRU waste currently on site at the NTS in preparation for shipment to WIPP. Characterization activities involve approximately 1,650 55-gallon drums and 58 nonstandard size boxes (oversize TRU waste boxes) of mixed TRU waste in storage at the TRU Pad and 248 55-gallon drums of classified TRU material in the Classified Storage Area. Waste characterization by headspace gas sampling, nondestructive assay, and nondestructive examination will be performed by the Centralized Characterization Project. Visual examination will be performed by the site contractor, Bechtel-Nevada. After characterization, oversize boxes will be shipped in the TRUPACT-III for disposal at WIPP. Upon completion of security upgrades at WIPP, classified TRU-contaminated materials from RFETS will be shipped to and disposed of at WIPP. The extension of this program to cover materials from other sites is now being examined.

Information regarding the site's existing and planned infrastructure is listed in Table A1.19-2.

Table A1.19-2 - Existing and Planned Infrastructure at NTS

Function	Facility/Activity	Completed	In Process	Planned Start
Characterization	Waste Examination Facility (WEF)	X		
Characterization	Mobile Units and WEF		X	
Transportation	Mobile Loading Units		X	July 2002
Certification	Certification Authority		X	July 2002
Transportation	Open Corridor		X	1st Quarter FY 2003

Regulatory Compliance

The NTS prepared a Site Treatment Plan in 1995 to comply with provisions of the Federal Facility Compliance Act. Storage and management of mixed TRU waste is currently accomplished as negotiated in 1996 by the DOE and the State of Nevada in the 1992 TRU Settlement Agreement. Additional requirements are discussed in a TRU Settlement Agreement between the two parties. These agreements established two milestones, both of which have been met (completed milestones are preceded by a check mark [/]).

/ Complete construction of the TRU waste facility by June 30, 1997.

/ Complete precharacterization activities required by WIPP no later than June 1, 1998.

Projected Shipping Schedules

Projected schedules for shipping volumes of CH TRU waste to WIPP for disposal are shown in A1.19-3. *The quantities reflect any volumetric expansion from visual examination of drums but do not account for volume changes from size reduction or sanitization*.

Table A1.19-3 - Projected Schedules for Shipping Volumes of CH TRU Waste from NTS

Fiscal Year	CH TRU Volume (cubic meters)	CH TRU Number of Shipments
2001	0	0
2002	0	0
2003	215	33
2004	0	0
2005	401	60
2006	0	0
2007	0	0
2008	0	0
2009	54	16
2010	0	0
2011-2015	0	0
2016-2020	0	0
2021-2025	0	0
2026-2030	0	0
2031-2035	0	0
2036-2070	0	

Issues and Alternatives

Inventory

After addressing associated needs and final packaging, the NTS plans to ship 670 m^3 of TRU waste to WIPP. The volume estimates and the current needs and strategy for addressing each are the contained in the following:

- Oversize boxes (267 m^3): The NTS plans to ship oversized boxes in the TRUPACT-III. The waste will be shipped to WIPP from the facility in FY 2005.

- Classified material (54 m^3): Upon completion of security upgrades at the WIPP facility, the NTS anticipates disposal at WIPP in FY 2009.

- Waste characterization (384 m^3 after volume expansion because of repackaging): The NTS does not have the necessary facilities for full characterization of TRU waste. The strategy is to use mobile vendors for waste characterization during FY 2002 through FY 2003.

Associated Needs

The DOE is implementing the Centralized Characterization Project discussed in Section 3.2.1.1 for this site. Shipping from NTS is expected to begin in October 2002.

A1.20 - Oak Ridge National Laboratory, Oak Ridge, TN

Objectives

ORNL is scheduled to have its waste characterization process certified by December 2002. The laboratory plans to send its first shipment of RH TRU waste to WIPP during FY 2005. The first shipment of CH TRU waste is planned for FY 2004. Shipments of both CH TRU and RH TRU waste will continue until WIPP's expected closing date in 2034.

Inventory

ORNL must manage the volumes of CH TRU and RH TRU waste listed in Table A1.20-1. An assessment of whether the waste has a clear path for disposal, has a plan for disposal, or is without a current plan for disposal is also shown.

Table A1.20-1 - Volume of CH TRU and RH TRU Waste To Be Managed at ORNL

	Stored (m^3)	Projected (m^3)	Total (m^3)	Clear Path (m^3)	Plan for Disposal (m^3)	Without a Current Plan (m^3)
CH	960	2,060	3,020	0	2,050	970
RH	1,310	530	1,840	0	1,590	250
Total	2,270	2,590	4,860	0	3,640	1,220

Infrastructure

The three primary TRU waste streams are as follows:

- Contact-handled (CH) TRU solids waste - packaged TRU waste that has an external surface dose rate that does not exceed 200 mr/h;

- Remote-handled (RH) TRU solids waste - packaged TRU waste which, if placed in an unshielded container, would have an external surface dose rate greater than 200 mr/h; and

- RH TRU sludge - TRU sludge stored in various liquid LLW tank systems at ORNL that will exceed 200 mr/h at the exterior of the final container when stabilized.

The site is constructing a privatized RH/CH TRU waste treatment facility for characterization and repackaging for start-up in December, 2002. The DOE has awarded a contract to Foster Wheeler Environmental Corporation to construct and operate the

TRU Waste Remediation Facility (TWRF) in the Melton Valley area of ORNL. All currently stored and newly generated waste from the ORNL will be transferred to the TWRF. Volumes shipped from the TWRF will be posttreated volumes. RH TRU sludge that have been processed at the TWRF will be disposed of by the end of FY 2006. CH TRU solid debris that has been processed will be disposed of by the end of FY 2005.

Information regarding the site's existing and planned infrastructure is listed in Table A1.20-2.

Table A1.20-2 - Existing and Planned Infrastructure at ORNL

	Facility/Activity	Completed	In Process	Planned Start
CH/RH Characterization/ Repackaging	Privatized RH/CH TRU Waste Treatment Facility Operation		X	Dec. 2002
Certification	Certification Authority			Dec. 2002
Transportation	Open Corridor		X	Dec. 2002

Regulatory Compliance

ORNL prepared a Site Treatment Plan in 1995 to meet its requirements under the Federal Facility Compliance Agreement, and the State of Tennessee Department of Environment and Conservation issued an associated Consent Order. These documents establish regulatory milestones regarding processing and disposal of mixed TRU waste as follows:

- By January 29, 2005, initiate shipment of stabilized RH TRU sludges to WIPP.
- By January 30, 2004, initiate processing of CH TRU solids
- By April 30, 2004, initiate shipment of processed CH TRU solids to WIPP.
- By September 30, 2006, complete shipment stabilized RH TRU to WIPP.
- By September 30, 2005, complete shipment CH TRU solids to WIPP.
- By September 30, 2010, complete shipment of RH TRU solids to WIPP.

Based on continuing discussions between the DOE and the State of Tennessee, the above dates are based on current expectations and changes to dates for shipping TRU waste to WIPP may be forthcoming.

Projected Shipping Schedules

Projected schedules for shipping volumes of CH TRU and RH TRU waste to WIPP for disposal are shown in Table A1.20-3. *The quantities reflect any volumetric expansion or reduction that would occur during waste processing*.

Table A1.20-3 - Projected Schedules for Shipping Volumes of CH TRU and RH TRU Waste from ORNL

Fiscal Year	CH TRU Volume (cubic meters)	CH TRU Number of Shipments	RH TRU Volume (cubic meters)	RH TRU Number of Shipments
2001	0	0	0	0
2002	0	0	0	0
2003	0	0	0	0
2004	330	74	0	0
2005	170	40	73	83
2006	33	8	126	142
2007	32	8	25	31
2008	30	7	28	41
2009	27	6	20	25
2010	27	6	7	11
2011-2015	130	29	35	55
2016-2020	140	32	35	55
2021-2025	140	30	35	55
2026-2030	140	32	35	55
2031-2035*	140	32	35	55
2036-2070	970**		250**	

* Although IPABS data are presented in a five-year increment, it is assumed that all waste will be shipped to WIPP during FY 2031 through 2034.

** This waste has no current plan for disposal because the WIPP disposal phase is projected to end in FY 2034.

Issues and Alternatives

Inventory

Oak Ridge expects to have 1,220 m^3 of TRU waste (both CH TRU and RH TRU) that cannot be accepted at WIPP since it is after the closing of WIPP. This waste, which has no current plan for disposal, will be stored until a suitable disposal plan is available.

Associated Needs

Oak Ridge has 3,640 m^3 of TRU waste that will be able to come to WIPP after associated needs are addressed. Needs include:

- Concurrence from WIPP for a certification approach based on newly generated waste characterized by visual examination;

- Completion of the Oak Ridge Characterization and Treatment Facility by Foster Wheeler; and

- Concurrence from WIPP for TRUCON codes relying on visual examination. ORNL is planning to initiate shipments of high-neutron emitting RH TRU waste coming from the pretreatment of liquids that currently generate TRU sludges. This waste will be shipped in a modified ten-drum overpack (TDOP) beginning in 2004.

As an alternative to the CH TRU waste baseline, the DOE is considering implementation of the Centralized Characterization Project discussed in Section 3.2.1.1 for this site.

A1.21 - Paducah Gaseous Diffusion Plant, Paducah, KY

Paducah Gaseous Diffusion Plant (PDGP) reports 4.6 m^3 of CH TRU waste in storage. After processing and packaging, this volume increases to 11.7 m^3. This volume is categorized as TRU waste with a plan for disposal. No additional generation of CH TRU waste is projected. PGDP will ship its waste to ORNL for final characterization, and subsequent transport for disposal at WIPP. PGDP has no RH TRU waste inventory and none is projected. No Consent Orders/Agreements milestones exist for this site.

A1.22 - Rocky Flats Environmental Technology Site, Golden, CO

Objectives

The Rocky Flats Environmental Technology Site (RFETS) received certification of its waste characterization processes in March 1998. The site sent its first shipment of CH TRU waste to WIPP in June 1999. Through FY 2001, RFETS sent 216 shipments with a total volume of 1358.3 m^3. As of December 31, 2001, 281 shipments with a total volume of 1,741 m^3 have been received at WIPP. The last shipments of CH TRU waste are scheduled in FY 2006. RFETS is scheduled for closure in 2006.

Inventory

RFETS must manage the volumes of CH TRU waste listed in Table A1.22-1. The site's assessment of whether the waste has a clear path for disposal, has a plan for disposal, or is without a current plan for disposal is also shown.

Table A1.22-1 - Volume of CH TRU Waste To Be Managed at RFETS

	Stored (m^3)	Projected (m^3)	Total (m^3)	Clear Path (m^3)	Plan for Disposal (m^3)	Without a Current Plan (m^3)
CH	4,460	10,290	14,750*	14,510	240	0
RH	0	0	0	0	0	0
Total	4,460	10,290	14,750	14,510	240	0

* Approximately 60 percent of this volume is from decontamination and decommissioning forecast.

Infrastructure

TRU and mixed TRU waste is currently stored in containers at a variety of locations on site while awaiting characterization and shipment to WIPP. At expected generation rates and as desired shipping rates increase, additional characterization and shipping capacities will be needed beginning in FY 2001. Facilities will need to be modified for sanitization, high flammable volatile organic compound treatment, and TRU liquid solidification processes.

Information regarding the site's existing and planned infrastructure is listed in Table A1.22-2.

Table A1.22-2 - Existing and Planned Infrastructure at RFETS

Function	Facility/Activity	Completed	In Process	Planned Start
CH Characterization	Waste Characterization (Buildings 371, 440, 559, 569, 664, 707, 776, 777, 991)	X		
CH Characterization	Repackaging/Blending (Building 440)	X		
CH Characterization	Visual Examination (Building 440)	X		
CH Characterization	Solid Sampling Coring (Building 440)		X	FY 2002
CH Characterization	Mobile or Off-Site Analytical Lab			FY 2003
CH/RH Repackaging	Repackaging (Building 440/776)	X		
CH Transportation	Loading Facility (Building 664)	X		
CH Transportation	Second Loading Facility (Building 440) (two loading bays)	X		
Certification	Certification Authority	X		
Transportation	Open Corridor	X		

Regulatory Compliance

RFETS prepared a Site Treatment Plan in 1995 to comply with provisions of the Federal Facility Compliance Agreement. A Federal Facility Compliance Agreement and Consent Order was issued in 1996. Environmental regulatory matters relating to TRU waste management for RFETS are established in legally binding agreements among the DOE, the Environmental Protection Agency, and the Colorado Department of Public Health and Environment. The environmental cleanup effort at the site is managed by cleanup agreements, known as the Rocky Flats Cleanup Agreements, negotiated periodically between the DOE and the Colorado Department of Public Health and Environment. The current set of Cleanup Agreements relating to TRU waste are listed below (completed milestones are preceded by a check mark [/]).

/ Demonstrate adequate storage capacity for TRU/mixed TRU waste by September 30, 2000, or complete a new TRU/mixed TRU waste storage facility by September 30, 2000.

C Complete off-site shipments of TRU/mixed TRU waste by 2006.

The DOE recently implemented contract and management reform at the RFETS to provide incentives for safe and early cleanup. The DOE has made a commitment for closure of the RFETS by December 15, 2006.

Projected Shipping Schedules

Projected schedules for shipping volumes of CH TRU waste to WIPP for disposal are shown in Table A1.22-3. *The quantities reflect any volumetric expansion or reduction that would occur during waste processing.*

Table A1.22-3 - Projected Schedules for Shipping Volumes of CH TRU Waste from RFETS

Fiscal Year	CH TRU Volume (cubic meters)	CH TRU Number of Shipments
Disposed	1,358	216
2002	3,700	630
2003	4,430	754
2004	3,680	626
2005	1,490	254
2006	470	80
2007	0	0
2008	0	0
2009	0	0
2010	0	0
2011-2015	0	0
2016-2020	0	0
2021-2025	0	0
2026-2030	0	0
2031-2035	0	0
2036-2070	0	

Issues and Alternatives

Inventory

Most TRU and mixed TRU waste will meet WIPP acceptance criteria but approximately five percent will require treatment prior to disposal. This waste will be sent to off-site treatment location(s) or will be treated on site as appropriate beginning in FY 2004. All wastes will be disposed of by the last year of generation (FY 2006).

Associated Needs

The RFETS has 240 m^3 of TRU waste that is acceptable at WIPP after addressing associated needs; this volume may increase as more characterization data are obtained. The strategy for disposal of this waste is based on the unacceptable condition affecting the waste. Waste exceeding decay heat restrictions will, for example, undergo gas generation testing. Waste with deficient or damaged packaging, waste containing prohibited items or materials, and/or waste that fails gas generation testing will be repackaged.

A1.23 - Sandia National Laboratories, Albuquerque, NM

Sandia National Laboratories-New Mexico has 28.5 m^3 of CH TRU waste in storage and projects an additional 77.0 m^3 of additional generation. SNL/NM has 1.5 m^3 of RH TRU waste in inventory with an additional 24.1 m^3 projected. This volume is categorized as waste with a clear path for disposal. Waste from SNL/NM will be shipped to LANL and is included in the LANL total waste volume. No Consent Orders/Agreements milestones exist for this site.

A1.24 - Savannah River Site, Aiken, SC

Objectives

The Savannah River Site (SRS) made its first TRU waste shipment in May 2001. Through the end of FY 2001 and as of December 31, 2001, SRS has made 7 shipments of 61.7 m^3. Shipments of CH TRU waste will continue until the projected end of the WIPP disposal phase in FY 2034.

Inventory

The SRS must manage the volumes of CH TRU waste listed in Table A1.24-1. An assessment of whether the waste has a clear path for disposal, has a plan for disposal, or is without a current plan for disposal is also shown. It should be noted that the yet-to-be-defined decontamination and decommissioning of plutonium facilities and the potential for new plutonium missions at the SRS could significantly increase the volume of TRU waste requiring disposal at WIPP.

One new mission to be considered is the conversion of plutonium metal (i.e., pits) into mixed oxide fuels for commercial industry use. The purification or scrubbing steps result in the generation of an Americium-241 enhanced waste stream which will be categorized as TRU waste. It is estimated that this stream will generate approximately 2,000 55-gallon drums of waste per year beginning in FY 2008 and last for approximately 15 years. Due to the preliminary nature of this effort, these waste estimates are not now included in Table A1.24-1. Future revisions to the NTWMP will continue to update newly identified waste streams.

Table A1.24-1 - Volume of CH TRU Waste To Be Managed at SRS

	Stored (m^3)	Projected (m^3)	Total (m^3)	Clear Path (m^3)	Plan for Disposal (m^3)	Without a Current Plan (m^3)
CH	10,850	3,730	14,580	20	13,840	720
RH	1	0	1	0	1	0
Total	10,850	3,730	14,580	20	13,840	720

Infrastructure

The SRS TRU Waste Project is working to develop the infrastructure necessary to process the many different TRU waste streams and containers, segregate out the non-TRU waste for disposal as mixed or low level waste, and characterize and certify the TRU waste for disposal at WIPP prior to its closure. The SRS completed the retrieval of buried drums in FY 1999. In FY 2000, SRS improved the storage conditions of TRU waste and began development of the characterization and certification program to meet WIPP disposal requirements. The SRS will process the low activity TRU waste drums in the Low-Activity TRU Waste Facility to be certified, repackaged, and shipped to WIPP for final disposal. This facility will be operational from 2004 through 2015 and will incorporate existing processing technology as well as robotics technology currently being developed. Work to be completed by FY 2006 includes the retrieval of 8,809 55-gallon drums (1,762m^3) and the disposal of approximately 2,200 drums of waste at WIPP (440 m^3). The high activity TRU waste containers will be processed in the High-Activity TRU Waste Facility to be certified, repackaged, and shipped to WIPP for disposal. This facility will be operational from 2015 through 2069 and will use the remote-handled size-reduction technology being developed for SRS. Information regarding the site's existing and planned infrastructure is listed in Table A1.24-2.

Table A1.24-2 - Existing and Planned Infrastructure at the SRS

Function	Facility/Activity	Completed	In Process	Planned Start
Retrieval	Retrieval buried drums	X		
Retrieval	Retrieval Facility	X		
Characterization	Visual Examination Facility	X		
Characterization/ Transportation	Waste Certification Facility	X		
Certification	Certification Authority	X		
Transportation	Open Corridor	X		
Characterization	Low-Activity TRU Waste Facility			2004
Characterization	High-Activity TRU Waste Facility			2015

Regulatory Compliance

SRS prepared a Site Treatment Plan in 1995 to comply with provisions of the Federal Facility Compliance Agreement. Mixed TRU waste at the SRS is regulated by the South Carolina Department of Health and Environmental Control (SCDHEC). As part of implementing the Federal Facility Compliance Agreement, a Consent Order was established between the DOE and the SCDHEC. The agreement states that TRU waste will be disposed of at WIPP, but specific time constraints relating to disposal do not yet exist in this agreement. After certification to WIPP requirements, the SRS will submit a disposal schedule to the SCDEC.
During the fourth quarter of FY 2008, SRS has committed to submit a RCRA Part B Permit application to South Carolina for the High Activity TRU Waste Processing Facility.

Projected Shipping Schedules

Projected schedules for shipping volumes of CH TRU waste to WIPP for disposal are shown in Table A1.24-3. The small amount of RH TRU (1 m^3) will be sent to ORNL for processing, packaging, and characterization. *The quantities reflect any volumetric expansion or reduction that would occur during waste processing.*

Table A1.24-3 - Projected Schedules for Shipping Volumes of CH TRU Waste from the SRS

Fiscal Year	CH TRU Volume (cubic meters)	CH TRU Number of Shipments
Disposed	62	7
2002	530	61
2003	310	35
2004	100	12
2005	100	12
2006	100	12
2007	100	12
2008	100	12
2009	100	12
2010	100	12
2011-2015	940	107
2016-2020	2,620	297
2021-2025	3,650	413
2026-2030	5,240	593
2031-2035*	2,000	227
2036-2070	720**	

* Although IPABS data are presented in a five-year increment, it is assumed that all waste will be shipped to WIPP during FY 2031 through FY 2034.

** This waste has no current plan for disposal because the WIPP disposal phase is projected to end in FY 2034.

Issues and Alternatives

Inventory

The SRS expects to generate about 720 m^3 of CH TRU waste after the scheduled closure of WIPP. This waste, which would have no current plan for disposal, would be stored until a suitable disposal path is available.

Associated Needs

The SRS has approximately 13,840 m^3 of TRU waste that is acceptable at WIPP after associated needs are addressed. The majority of the needs associated with this waste are related to the lack of infrastructure required for repackaging and processing. The site's strategy is to develop on-site processing capability for these wastes. The SRS plans to modify existing facilities by 2004 for waste characterization needs. In addition, the site plans to construct new facilities for processing and repackaging prior to 2015.

A1.25 - Separations Process Research Unit, Schenectady, NY

The Separations Process Research Unit (SPRU) reports 470 m^3 of stored waste. Of this 470 m^3, 50 m^3 will be managed as CH TRU waste for disposal at WIPP. The remaining 420 m^3 is expected to be categorized as low-level waste and appropriately disposed. The small inventory of CH TRU waste and the lack of waste characterization infrastructure make SPRU a candidate for the Centralized Characterization Project discussed in Section 3.2.1.1. No Consent Orders/Agreements have been identified for this site.

A1.26 - U.S. Army Material Command, Rock Island, IL

The U.S. Army Material Command (USAMC) reports 2.5 m^3 of CH TRU waste in storage. This volume is categorized as TRU waste with a plan for disposal. No additional generation of waste is projected. This small inventory and the lack of waste characterization infrastructure make USAMC a candidate for the Centralized Characterization Project discussed in Section 3.2.1.1. The USAMC has no RH TRU waste inventory; none is projected.

A1.27 - West Valley Demonstration Project, West Valley, NY

The West Valley Demonstration Project (WVDP) reports 77 m^3 of CH TRU waste in storage and expects to generate an additional 16 m^3. WVDP also has 471 m^3 of RH TRU waste and expects to generate 8.8 m^3 in the future. The waste is currently considered to be commercial waste and is not eligible for disposal at WIPP. Plans are to continue to store this waste at the project until suitable disposal options are available. The DOE is, however, considering whether all or a portion of WVDP waste may be

eligible for disposal at WIPP because the waste was generated as a result of reprocessing Hanford defense spent nuclear fuel.

A1.28 - Waste Isolation Pilot Plant, Carlsbad NM

Objectives

WIPP began CH TRU waste receipt operations on March 26, 1999. Remote-handled TRU waste receipt operations are scheduled to begin in FY 2003. Receipt and disposal of CH TRU and RH TRU waste will continue until WIPP's projected closing in 2034.

Infrastructure

WIPP plans to meet the necessary disposal schedules of all sites. Panels 1 and 2, consisting of seven rooms each, are complete. Mining of additional panels is planned to continue to meet the site disposal schedules.

WIPP currently processes TRUPACT-IIs using two docks, each with a single crane, and returns the shipping packaging to generators for reloading. To meet the increasing disposal demands of the generator/storage sites, options are being discussed on the addition of a third dock with two cranes and the possibility of retrofitting existing docks with additional cranes to facilitate unloading and shipping packaging turnaround.

The transportation system is an integral part of the program strategy and provides the linkage between the waste generator/storage sites and the WIPP disposal site. CH TRU waste shipped to WIPP is transported in TRUPACT-IIs, by truck, on specially designed trailers that can carry up to three TRUPACT-IIs. All TRU waste bound for WIPP is transported along shipping routes, or corridors. Based on the integrated program strategy, the DOE opens shipping corridors prior to the initiation of shipping from generator/storage sites and maintains the open corridor for as long as shipping continues.

As of December 31, 2001, the DOE had a fleet of 48 TRUPACT-IIs and 21 TRUPACT-II trailers. The DOE plans to procure additional packaging and trailers based upon system performance versus planned need. As discussed in Chapter 5, the site shipping demand currently exceeds the transportation capability in FY 2002.

The HalfPACT is an additional shipping packaging designed to transport dense CH TRU waste. The HalfPACT received a NRC Certificate of Compliance on November 2, 2000. The DOE plans to procure HalfPACTs based upon system performance versus planned need.

The RH-72B Cask will be used to transport RH TRU waste. The NRC issued a Certificate of Compliance for the RH-72B shipping container in March 2000. The DOE plans to have delivery of these casks begin during FY 2002.

Regulatory Compliance

Two regulatory agencies provide major oversight of disposal at WIPP. The EPA provides regulatory oversight of the radioactive portion of waste disposal. The NMED provides regulatory oversight of the hazardous component of waste disposed of at WIPP. The EPA certified WIPP to receive TRU waste in May 1998. Provisions of the decision require WIPP to be recertified at five-year intervals until its scheduled closure in 2034. The NMED issued a HWFP for WIPP in October 1999.

Issues and Alternatives

Associated Needs

Based on existing infrastructure (two docks with single cranes), WIPP is currently capable of processing 17 to 18 shipments per week, single-shift operation. Planned additions to the dock infrastructure (third dock with a dual crane) could allow up to 29 to 30 shipments per week, single-shift operation.

A1.29 Summary of Consent Orders/Agreements Milestones

Consent Orders/Agreements milestones listed in Sections A1.1 through A1.27, if applicable, are summarized in Table A1.29-1. Shaded text indicates that the milestone is complete.

Table A1.29-1 - Summary of Consent Orders/Agreements Milestones

SITE	REGULATORY MILESTONE
ANL-E	No specific milestones are set; no enforcement action will be taken as long as terms of the Site Treatment Plan are met.
ANL-W	**INEEL Site Treatment Plan for Mixed Waste and Idaho Settlement Agreement**
	C Initiate Conceptual Project activities for the RTF, 2001. C Initiate Preliminary Design activities for the RTF, 2003. C Initiate Final Design activities for the RTF, 2004. C Receive approval for Construction Start of RTF, 2005. C RTF operation scheduled to begin, 2009.
BCL	**License Amendment before the NRC**
	Any radioactive contamination associated with activities of the Battelle Columbus Laboratories prior to 1986 must be cleaned up by the end of 2005.

Table A1.29-1 - Summary of Consent Orders/Agreements Milestones

SITE	REGULATORY MILESTONE
Hanford	**Tri-Party Agreement**
	C Initiate processing of CH TRU and mixed TRU waste at the Waste Receiving and Processing Facility by December 1998. 1. Submit Hanford Site TRU/TRUM waste project management plan to Washington State Department of Ecology by June 2000 C Complete construction of small container CH TRU and mixed TRU waste retrieval facility and initiate retrieval of small container TRU and mixed TRU waste from the 200 area burial grounds by September 2000. C Award necessary privatized contracts for processing RH and large-size TRU and mixed TRU waste by September 2003. C Complete Phase I retrieval of post-1970 CH TRU and mixed TRU waste by September 2004. C Complete construction and initiate hot operations of RH and large-size TRU and mixed TRU waste by June 2005.
INEEL	**Idaho Settlement Agreement**
	C Place contract for construction of an Advanced Mixed Waste Treatment Facility for the treatment of TRU wastes. (Completed December 1996) C Initiate shipments of TRU waste to WIPP, or other such facility designated by the DOE, by April 30, 1999. (Completed April 1999) C By December 31, 2002, ship no fewer than 3,100 m^3 (15,000 drum equivalents) of TRU waste out of the State of Idaho. C Complete construction of Advanced Mixed Waste Treatment Facility by December 31, 2002. C Begin operation of the Advanced Mixed Waste Treatment Facility by March 31, 2003. C After January 1, 2003, ship no less than a 2,000 m^3 per year running average of TRU waste out of the State of Idaho. C Ship TRU waste to WIPP, or other such facility designated by the DOE, by a target date of December 31, 2015, and in no event later than December 31, 2018.
LLNL	**California Department of Toxic Substances Control**
	C Establish a schedule for completing characterization of mixed TRU waste by September 30, 1996. (Completed as scheduled). C Establish a schedule for shipping mixed TRU waste to WIPP by December 31, 1998. (Completed as scheduled)

Table A1.29-1 - Summary of Consent Orders/Agreements Milestones

SITE	REGULATORY MILESTONE
LANL	**New Mexico Environment Department**
	Submit treatment permit application to the NMED by December 31, 1999, and complete treatment by December 31, 2010, unless WIPP is opened on timely schedule.
Mound	**Ohio Environmental Protection Agency**
	The DOE has committed to relinquishing its facility to the city of Miamisburg by the end of 2004 (2003 is Mound's targeted completion date for TRU activities; 2004 is Mound's baseline budget completion date for TRU activities).
NTS	**Nevada Test Site 1998 Site Treatment Plan Final Update**
	C Complete construction of TRU waste facility by June 30, 1997. (Completed) C Complete precharacterization activities required by WIPP no later than June 1, 1998. (Completed September 1998)
ORNL	**Site Treatment Plan for Mixed Waste on the U.S. DOE OR, last updated May 1999 (Note: Milestones involving shipment of TRU waste are currently being renegotiated between the DOE and the State of Tennessee.)**
	C By January 29, 2005, initiate shipment of stabilized RH TRU sludges to WIPP. C By January 30, 2004, initiate processing of CH solids. C By April 30, 2004, initiate shipment of processed CH solids to WIPP. C By September 30, 2006, complete shipment of stabilized RH TRU sludges. C By September 30, 2005, complete shipment of CH TRU solids to WIPP. C By September 30, 2010, complete shipment of RH TRU solids to WIPP.
RFETS	**Rocky Flats Cleanup Agreement**
	C Demonstrate adequate storage capacity for TRU and TRU/mixed waste by September 30, 2000, or C Complete construction of a new TRU/mixed TRU waste storage facility by September 30, 2000. (Complete) C Complete off-site shipments of TRU/mixed TRU waste by 2006.
SRS	**South Carolina Department of Health and Environmental Control**
	Submit RCRA Part B Permit application to South Carolina during fourth quarter of FY 2008 for the High Activity TRU Waste Processing Facility.
Small-Quantity Sites	
	C The ETEC has submitted a RCRA Part B Application to the State of California for mixed waste in storage on site. The permit is currently in review within the California Department of Toxic Substances Control. Approval is contingent upon other related state activities.

Table A1.29-1 - Summary of Consent Orders/Agreements Milestones

SITE	REGULATORY MILESTONE
	C The DOE and Boeing Canoga Park (management and operating contractor for the ETEC) have signed an agreement to close the ETEC site in 2007, so that the land can be released back to Boeing. To meet the 2007 closure date, ETEC must complete removal of all TRU waste by October 2002.