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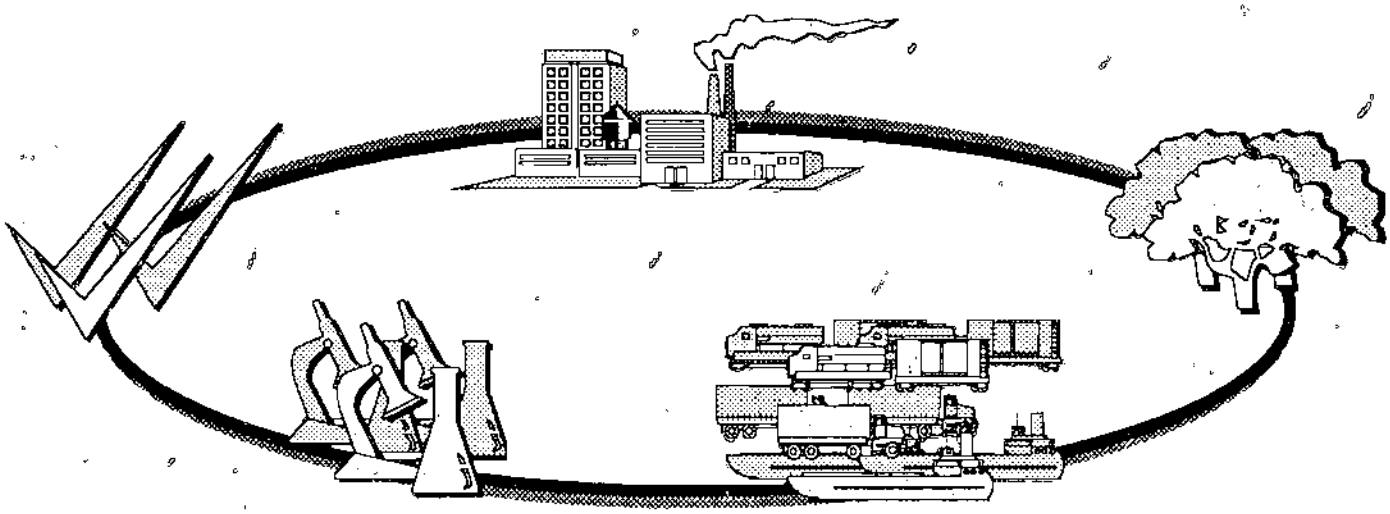
United States
Department of Energy

Environmental Restoration and Waste Management

FIVE-YEAR PLAN

Fiscal Years 1993-1997



August 1991

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The Secretary of Energy
Washington, DC 20585

August 1991

I am pleased to submit to the Congress and the Nation the Department of Energy's (DOE) Environmental Restoration and Waste Management Five-Year Plan for FY 1993-1997.

This annual update of the Five-Year Plan, the third of its kind, reinforces our commitment to environmental quality and lays a solid foundation on which DOE will continue to build its environmental restoration and waste management programs. It also emphasizes our many accomplishments and progress to date in this important area.

One of my earliest actions at DOE was to call for a change in culture--a change in the way DOE meets its environmental responsibilities. Changing the DOE mission to emphasize accountability and environmental management is central to this new culture. This Plan and its goals, objectives, and milestones reinforce our commitment to the culture change. The Five-Year Plan is the product of the hard work of nearly 1,000 dedicated individuals--at DOE Headquarters and within its field office structure--who comprise the Office of Environmental Restoration and Waste Management.

This Plan demonstrates the value of consolidating DOE's environmental restoration and waste management programs and of creating a technology development program. It also confirms that the Nation both requires and benefits from DOE's initiatives in technology development. Investment in these areas already shows positive returns for DOE. The management practices, new technologies, and cadre of trained individuals established to support DOE's environmental mission will serve other Federal agencies and industry as well.

The Five-Year Plan reaffirms DOE's dual goals of achieving timely compliance with all applicable environmental requirements and of cleaning up the 1989 inventory of inactive sites and facilities within 30 years. I committed DOE to the 30-year goal in the first Five-Year Plan because I agreed with affected States, Indian Nations, and other interested parties that a goal without a foreseeable end is not a firm commitment. This commitment has not changed.

Sincerely,

James D. Watkins
Admiral, U.S. Navy (Retired)

FYP DOE/S-0089P

ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT

Five-Year Plan
Fiscal Years 1993 - 1997

AUGUST 1991

United States Department of Energy
Washington, DC 20585

ACKNOWLEDGEMENT

This Five-Year Plan is the product of more than a thousand contributors. Unlike its predecessors, this Plan omits the list of contributors' names. Omission is not to deny recognition of either the outstanding efforts or the high quality of the contributions. With the institutionalization of the planning process, however, the contributor list for this Plan has become virtually identical to the extended directory of the Office of Environmental Restoration and Waste Management personnel, including Federal and contractor personnel at Headquarters, the field offices, and at Department of Energy (DOE) installations.

The Plan is founded on data from all across the DOE system. The largest set of contributors is composed of the personnel at each installation, who prepared and compiled two cycles of Activity Data Sheets (ADSs) and Activity Packages (APs) addressing multiple funding cases. Coordination, review, and consolidation of the ADSs and APs at the field offices, and again at Headquarters, to form the input data for the Plan have required exceptional and sustained effort. Preparation of the document itself, through preliminary drafts, reviews, and multiple revisions, engaged another set of contributors. Reviewers, both internal and external, are also contributors to the Five-Year Plan, for they helped to specify the final product. Ultimately, document production, including typing, graphics, editing, revision, organization, and printing, completed the campaign. All of this has been accomplished on a rigorous and demanding schedule. For countless dedicated participants, the 40-hour work week was extended to include the weekend in addition to many late-night and early morning sessions.

Both the efforts and the products of the contributors to this Plan are acknowledged. The measure of pride to which contributors are entitled for their work is vastly greater than any that could be derived from a listing of names.

ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT (EM)
FIVE-YEAR PLAN
FISCAL YEARS 1993-1997

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ENVIRONMENTAL RESTORATION

AND

WASTE MANAGEMENT

Five-Year Plan

Executive Summary

Fiscal Years 1993 - 1997

AUGUST 1991

United States Department of Energy
Washington, DC 20585

EXECUTIVE SUMMARY

INTRODUCTION

In the first Five-Year Plan, written in 1989, the Department of Energy (DOE) committed to rapidly bringing all operating facilities into compliance with applicable laws and regulations and to cleaning up the 1989 inventory of contaminated inactive sites and facilities by the year 2019. This FY 1993-1997 Five-Year Plan moves the Office of Environmental Restoration and Waste Management (EM) one step closer to this 30-year goal.

The overall EM strategy has three thrusts. First, where risk assessment shows an actual or potential threat to human health and safety—do immediately whatever is possible to reduce, mitigate, stabilize, and confine the threat. Second, where nobody knows how to solve a problem (as distinct from merely preventing it from getting worse)—act decisively to develop methods to do it right the first time. Third, where compliance and cleanup must proceed with or without next-generation technologies—plan, with affected parties and within the provisions of Interagency Agreements, the work to be accomplished and its schedule.

This third Five-Year Plan discusses current EM program accomplishments, what the program intends to achieve over the next 5 years, and where it needs to be heading in order to meet its 30-year and other environmental goals.

RELATING EM OBJECTIVES TO ACCOMPLISHMENTS

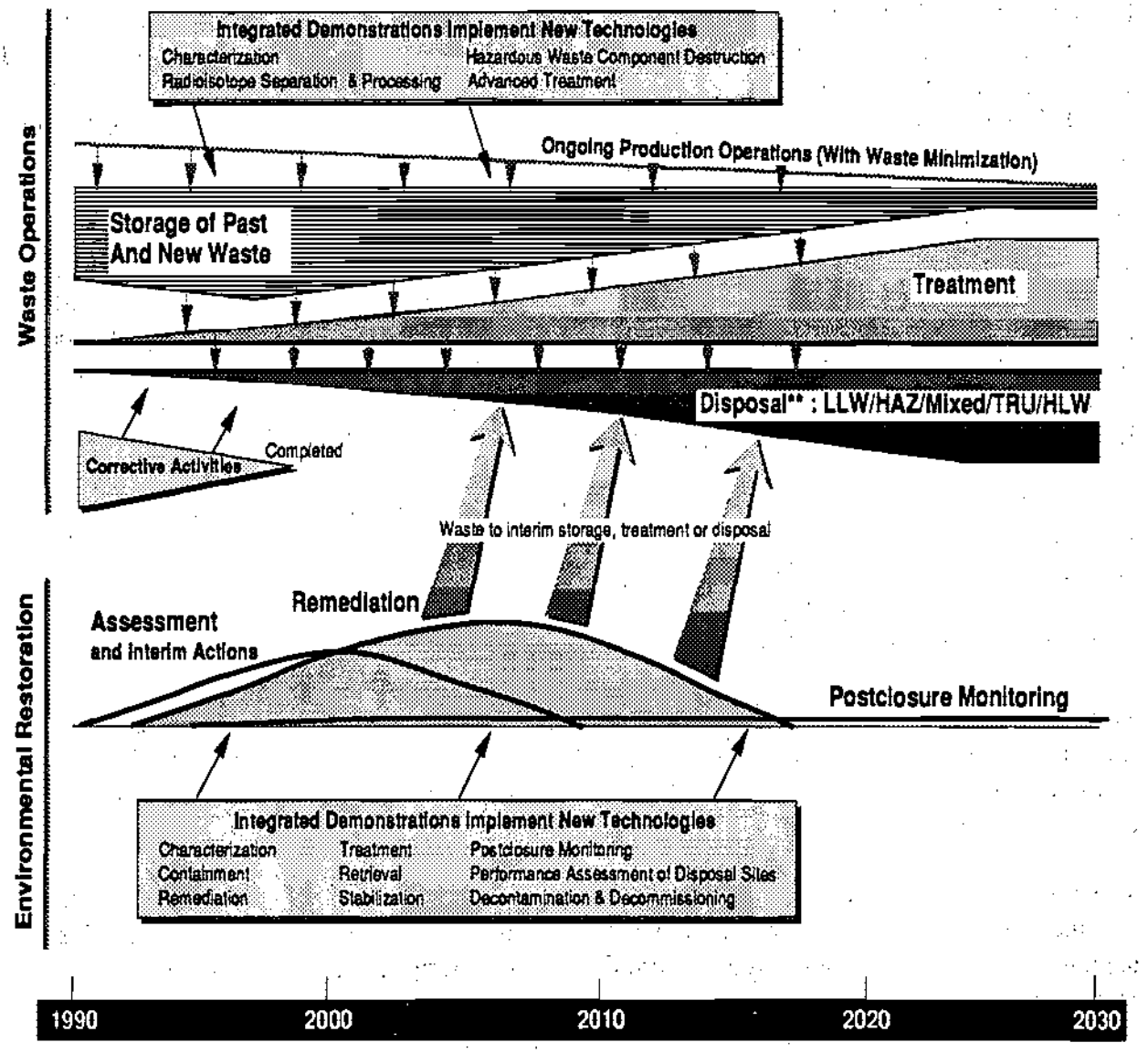
To evaluate the significance of EM accomplishments to date, it is necessary to understand the program's approach to national planning for accomplishing its goals and objectives. EM's national planning focuses on completing projects leading to compliance, stabilization, reduction of near-term risk, and initiation of efforts leading to long-term or permanent solutions.

The major accomplishments to date relate to the storage of waste, development of treatment facilities, assessment of environmental releases and their risks, development of technologies to support these unprecedented activities, and, finally, development and implementation of management and planning systems. Tomorrow's accomplishments will relate more to ongoing treatment, disposal, and postclosure monitoring activities. The changing nature of EM accomplishments over time is depicted by the National Planning Chart (Figure 1).

The FY 1993-1997 Five-Year Plan identifies seven objectives that must be achieved in order for EM to accomplish its 30-year goal. Below, major accomplishments are summarized relative to these objectives. A more detailed listing of accomplishments is included within the Plan.

National Planning Chart for Environmental Restoration and Waste Operations Programs*

This chart shows (1) phasing of Waste Operations activities from Storage to Treatment to Disposal, (2) completion of Corrective Activities, (3) phasing of Environmental Restoration activities from Assessment to Remediation to Postclosure Monitoring, and (4) flow of New Technologies to the Environmental Restoration and Waste Operations activities.



* The timing of the integrated activities shown is affected by available funding, infrastructure (e.g., availability of trained personnel, analytical laboratories), regulatory developments, and other factors.

** Disposal of Low-Level Waste (LLW), Hazardous Waste (HAZ), Mixed Waste, Transuranic Waste (TRU), and High-Level Waste (HLW) includes waste from past and current production, decontamination and decommissioning, and remediation.

Figure 1. National Planning Chart.

CORRECTIVE ACTIVITIES

OBJECTIVE: Bring all DOE facilities and sites into compliance and operate them in accordance with applicable laws and regulations aimed at protecting public health and the environment.

EM's mission derives from DOE goals of achieving and maintaining full compliance with applicable Federal, State, and local health, safety, and environmental laws and regulations for both current operations and previously contaminated or inactive facilities and sites. Efforts to bring DOE operations into compliance are driven by a host of Federal and State statutes, regulations, rules, and orders. Each type of waste (i.e., high-level, transuranic, low-level, hazardous, mixed hazardous, and sanitary wastes) is governed by different laws and regulations. The DOE strategy for complying with the variety of regulations under which it operates is to enter into negotiations with affected agencies with the intent of getting agreement on activities for achieving and maintaining compliance with applicable regulations. Interagency Agreements (IAGs) are the means that EM uses to communicate its intentions and to report its progress in complying. EM's commitment to full compliance with applicable environmental laws and regulations is reflected in EM's multiple Corrective Activities and documented through the agreements DOE has entered into with Federal and State regulators.

Corrective Activities: Activities and projects required to bring DOE's active and standby facilities into compliance constitute Corrective Activities. Corrective Activities range from the installation of boilers that meet air-pollution requirements to the institution of programs to reduce or eliminate polychlorinated biphenyls (PCBs) to the removal of leaking underground storage tanks. DOE's goal is full compliance with all applicable regulations, and it is anticipated that the backlog of noncompliances will be eliminated by 1997. Forty-nine Corrective Activities have been completed with another 54 expected to be completed in FY 1991.

Compliance Agreements: In order to comply with the multiple environmental statutes and regulations governing DOE waste management activities, DOE often enters into compliance agreements with Federal and State regulators. These agreements are useful in establishing jurisdictions, authorities, and other legal responsibilities for the parties, including activity schedules and milestones. A list of current and pending compliance agreements is provided in the Plan. Sixty-four compliance agreements have been negotiated to date. This number could increase to approximately 80 by the end of FY 1991.

WASTE MANAGEMENT

OBJECTIVE: Treat, store, and dispose of hazardous, radioactive, and mixed waste in an environmentally sound and effective manner.

In order to manage existing waste, to decontaminate and decommission facilities, to complete the restoration of inactive sites, and to support ongoing production and research missions, EM must develop new storage, treatment, and disposal facilities.

EM is now focusing on ensuring adequate, permitted storage capacity for existing waste and on minimizing the generation of new waste. At the same time, EM is constructing and testing first-of-a-kind facilities for treatment and disposal. The National Planning Chart (Figure 1) shows waste storage activities as prominent in the near term and tapering off as new treatment and disposal facilities come on-line.

In the waste treatment area, the new Waste Calcining Facility at the Idaho Chemical Processing Plant was restarted in December 1990. The calciner converts high-level liquid waste into calcine—a solid and therefore more stable form—for storage. Since restart, about 150,000 gallons of waste has been calcined. For the management of waste, EM has added a number of newly permitted storage facilities and has made progress in developing others. EM is managing 100 million gallons of high-level radioactive waste in 327 tanks and more than 14 million 55-gallon drums of varying waste forms.

Progress has been made in the planning and construction of permanent disposal facilities, although some setbacks have also occurred. On the accomplishment side, the Waste Isolation Pilot Plant (WIPP), scheduled to be the Nation's first geologic repository, has received Environmental Protection Agency approval of its no-migration variance petition. Originally, WIPP was to have opened in October 1988, and 125,000 tons of transuranic (TRU) waste were to have been emplaced retrievably for a 5-year test period. Construction of the base facility was completed in 1989, and commencement of the test demonstration phase could begin as early as summer 1991. The delay reflects the cumulative impact of legal, technical, environmental, and logistical requirements that must be satisfied before beginning the Test Phase.

Construction of the Defense Waste Processing Facility (DWPF) at the Savannah River Site is complete, and cold test (i.e., nonradioactive) operations have begun. Vitrification operations using radioactive waste are expected by 1993. At the West Valley Demonstration Project in New York, 80 percent of the high-level waste has been pretreated, with vitrification scheduled to begin in September 1996. The Hanford Waste Vitrification Plant will benefit from the experience gained through both the DWPF and the West Valley Demonstration Project. A study is currently being conducted to determine the best approach to pretreatment.

The Savannah River Site has also begun processing liquid low-level waste (LLLW) with concrete. This process turns the liquid waste into grout, which is in turn disposed of in vaults. The unit is designed to process about 6 million gallons of LLLW per year. Additionally, the mixed LLW disposal facility at the Nevada Test Site is scheduled to begin operations in April 1992.

DOE is also moving forward with its pollution prevention program. A variety of programmatic and technical activities are occurring throughout the DOE complex. The following is a partial listing of activities: source reduction through materials substitution; waste stream segregation and process changes; employee training and awareness programs; recycling of solvents, oils, metals, and paper; process evaluations for waste minimization; and awards/incentive systems to encourage the development of waste minimization innovations. DOE is currently working to establish reasonable quantitative waste minimization goals, improve field office reporting, and issue guidance to promote waste minimization throughout the complex.

ENVIRONMENTAL RESTORATION

OBJECTIVE: Contain known contamination at inactive sites and vigorously assess the uncertain nature and extent of contamination at other sites to enable realistic planning, scheduling, and budgeting for cleanup.

The goal for all Environmental Restoration (ER) activities is to ensure that the risks to the environment and to human health and safety posed by inactive and surplus facilities and sites are either eliminated or reduced to prescribed, safe levels. A near-term bias for action to expedite actual cleanup wherever and whenever possible and a program of technology development directed toward ER needs are essential elements of the strategy for reaching DOE's 30-year goal.

ER's current emphasis is on the assessment of the extent and nature of contamination. Closures and interim remedial actions are also being undertaken in the near term. Full remediation will follow assessment efforts, with the monitoring of the sites continuing after the completion of cleanup.

ER estimates that there are more than 3,700 hazardous waste sites under its jurisdiction. ER also manages more than 5,000 properties associated with the Uranium Mill Tailings Remedial Action (UMTRA) Program and the Formerly Utilized Sites Remedial Action Program. Although most of ER's resources are now focused on the identification and assessment of sites, EM has also completed a significant number of cleanups.

In FY 1990 and 1991, EM completed 57 assessments and 33 cleanups. These figures include actions taken under the Resource Conservation and Recovery Act (RCRA), the Comprehensive Environmental Response, Compensation, and Liability Act, and the Decontamination and Decommissioning Program. The completed assessments include solid waste management units at the Oak Ridge K-25 Site in Tennessee and all 16 operable units at the Rocky Flats Office in Colorado. In addition, 30 interim remedial actions or removal actions were started and 15 were completed. These actions include the Sandia National Laboratory-Albuquerque Chemical Waste Landfill, the Sandia National Laboratory-Livermore Waste Oil Area and Septic Tank Systems, and the Pinellas Ground Water Project.

Cleanup has been completed on 8 of 24 UMTRA processing sites. Four of these projects were completed during FY 1990: Green River, Utah; Tuba City, Arizona; Riverton, Wyoming; and Lakeview, Oregon. Additionally, remediation was completed at 654 UMTRA vicinity properties during the last year, bringing the total to 4,088.

In FY 1990, RCRA-required closures were completed at various locations across the DOE complex. These closures included the S-3 ponds at the Y-12 Plant in Oak Ridge and the M-area Hazardous Waste Management Facility and the Mixed Waste Burial Mound at Savannah River. The Water Boiler Reactor and Ultra-High Temperature Reactor Experiment at Los Alamos National Laboratory, three buildings at the Y-12 Plant, and three buildings at the Battelle Columbus Laboratories have also been decontaminated and decommissioned.

PUBLIC INVOLVEMENT

OBJECTIVE: Continue to expand the public participation process.

Public participation accomplishments are associated with the broadening of predecisional opportunities for affected and interested parties and members of the general public.

EM has worked to expand opportunities for early public involvement in 5-year planning. EM facilitates public involvement by holding early public meetings during the development of basic input to the Five-Year Plan, by scheduling formal reviews of the draft Five-Year Plan by the State and Tribal Government Working Group (STGWG) and the Stakeholders' Forum, and by ensuring that public comments on the previous Five-Year Plan are responded to in the subsequent Five-Year Plan. Public comments on Site-Specific Plans influence future site-specific and general 5-year planning processes.

This year public meetings were held in March 1991, near the start of the FY 1993-1997 Five-Year Plan development process. These public meetings had three purposes: (1) to explain to the public and regulators how EM priority systems work and how the field offices conducted their initial evaluation and ranking of Activity Data Sheets (ADSs); (2) to allow regulators and the public to review the ADSs and determine whether these priorities were consistent with their concerns; and (3) to incorporate these comments into the development of both the next Five-Year Plan and the budget request for FY 1993. The success of these meetings varied from site to site. EM intends to progress based on lessons learned.

STGWG held its tenth meeting on May 15-17, 1991. The purpose of this meeting was to provide comments on the predecisional draft of this third Five-Year Plan. During this meeting, STGWG members made a number of recommendations, including the suggestion to provide a more extensive discussion of accomplishments at the beginning of the document. Our emphasis on concrete program accomplishments in this Executive Summary directly responds to this recommendation.

The Stakeholders' Forum, held May 19-21, 1991, was also very useful in providing feedback to DOE on the predecisional draft of this third Five-Year Plan. Many of the participants recommended that the Five-Year Plan place more emphasis on education needs, worker health and safety issues, future work force requirements, and mechanisms to increase local public involvement in EM program planning. Stakeholders' comments were used in making a substantial revision, particularly of Section 1 of this Plan.

EM is committed to a DOE culture founded on the principles of openness, responsiveness, and accountability. STGWG and Stakeholders' Forum meetings on the predecisional draft of the third Five-Year Plan are concrete examples of EM's support for early public participation in 5-year program planning and decision making.

Further discussions of STGWG and Stakeholders' Forum comments on the predecisional draft of this Five-Year Plan are provided in Appendix E.

TECHNOLOGY DEVELOPMENT

OBJECTIVE: Develop and implement innovative, cost-effective technologies to facilitate compliance with applicable laws, regulations, and agreements and to minimize the generation of waste.

Technological constraints hinder both effective characterization of the subsurface environment and treatment and disposal of DOE-unique process wastes. Without new or improved technologies and a well-developed infrastructure, DOE will not be able to comply with applicable Federal, State, and local regulations.

The Technology Development Program supports both the Waste Operations and ER Programs in EM through the development and application of new technologies. To date, the Research, Development, Demonstration, Testing, and Evaluation (RDDT&E) program has more than paid for itself in cost savings.

The Technology Development Program is designed to ensure that new technologies are available as the ER and Waste Operations Programs progress (Figure 1). Thus, for example, in the restoration area the Technology Development Program focuses in the near term on providing technologies for site investigation and the study of remediation alternatives. Future technology efforts will focus on treatment, remediation, and stabilization. Finally, the program emphasis will shift to developing technologies to ensure that the cleanup has been effective.

In the waste management area, technology development activities include identifying, testing, and adopting less hazardous process reagents to minimize the generation of future wastes. For example, chlorinated hydrocarbons were eliminated in alloy processing at the Oak Ridge Y-12 Plant. The newly created Environmentally Conscious Manufacturing Program at Sandia National Laboratory and the Mound, Pinellas, and Kansas City Plants as well as a new Memorandum of Understanding with the U.S. Air Force and the Boeing Corporation target the elimination of chlorinated hydrocarbon use.

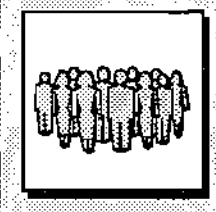
Progress has also been made in the development of methods for handling wastes that are less hazardous to humans and the environment. In situ treatment of wastes and contaminated soils reduces the exposure of personnel to radioactive or hazardous materials. While in situ vitrification technology has existed for some years, recent advancements in electrode feed control have improved the technology's ability to immobilize metal-bearing buried wastes.

Technologies are being developed to remediate volatile organic compounds (VOCs) in groundwater. For example, Savannah River has successfully completed an Integrated Demonstration (ID) for remediation of VOCs in the vadose zone. Through the combination of

airstripping and directional drilling technologies, VOC removal is made faster and cheaper than before, and savings in the millions of dollars are anticipated.

The development of solvent substitutes and reusable stainless steel high-efficiency particulate air (HEPA) filters have contributed to the attainment of waste minimization objectives. Comparative estimates show that current HEPA filtration costs $122 million and that reusable HEPA filtration costs $24 million. Net savings of $98 million annually is likely if reusable filters are chosen.

Advanced instrumentation that can be used in the field to make immediate analyses allows the faster and cheaper characterization of sites. Instrumentation advancements include use of fiber optics, laser-induced spectroscopy, and ion trap mass spectroscopy. The cost of applying these new technologies to analyze field samples is estimated to be as low as 10 percent of current methods.



HUMAN RESOURCES

OBJECTIVE: Ensure availability of human resources (i.e., trained scientists, engineers, and technicians) to carry out the EM mission.

Although a systematic process for defining and annually updating Federal and contractor work force requirements and availability will not be in place until later this fiscal year (1991), EM is initiating education and training programs, especially for the Fernald and Hanford Sites, to ensure that the current EM work force can carry out immediate and near-term mission responsibilities.

The Technology Development Program has the responsibility for ensuring that there are sufficient numbers of trained personnel to complete EM's long-term mission. To support the development of training for technical personnel, academic partnerships have been established with educational institutions in New Mexico and South Carolina. As of FY 1990, 8,600 students and 80 faculty are pursuing a total of 27 collaborative research tasks. The Technology Development Program has also established an academic partnership with a consortium of Historically Black Colleges and Universities and Minority Institutions. This partnership includes 17 institutions with a combined enrollment of 106,000 students.

The Technology Development Program is also establishing precollege environmental education outreach programs and 2-year college training programs. The technician training programs currently involve 700 students and 27 faculty. Precollege and general public outreach programs have already involved 137,000 citizens, 122,000 students, and approximately 2,400 teachers. Ensuring the future availability of sufficient numbers of scientists and technicians will require the significant expansion of current EM educational programs, especially those targeted to women and minorities. These two groups, when added together, constitute the largest potential talent pool for scientific and technical personnel for the 21st century.

MANAGEMENT

OBJECTIVE: Develop an effective management control program to ensure that public funds expended by EM programs achieve maximum public health and environmental protection benefits.

A number of initiatives were instituted during the past year to improve the management of EM programs and provide a sturdy planning platform for all activities within EM. These initiatives apply management practices proven through use in the private sector.

Effective Cost Growth Management: If EM is to accomplish its 30-year goal, cost overruns and schedule slippages must be prevented. Consequently, EM has implemented over 15 initiatives to improve the accuracy of cost and schedule estimates and to reduce the unit cost of ER and waste management activities. The first set of initiatives addresses the heart of cost and schedule issues by identifying means for reducing the cost and time required to do work in the EM program. These initiatives focus primarily on the interface between technology development and field environmental management activities. In addition, several studies will be completed over the next year to examine other factors that can result in the reduction of costs. One of these studies will examine the capacity of the DOE program infrastructure to absorb the large scope of EM work. Another study is evaluating the means for accelerating the learning process for implementing new environmental technologies.

The second set of initiatives concerns the improvement in the current cost and schedule estimating guidelines, field training seminars on cost and schedule estimating, the development of unit cost libraries, and the research on the drivers of cost and schedule uncertainties in ER projects. To establish a baseline for these cost and schedule initiatives, the Waste Operations and ER Programs conducted cost and schedule reviews of inputs to this year's Five-Year Plan. These reviews were designed to improve DOE Headquarters' understanding of the cost and schedule estimating process and to review the traceability and consistency of field office and program cost estimates. Review teams, led by DOE Headquarters personnel and supported by contractor technical and cost engineering professionals, visited all the major DOE installations in January and February 1991.

The EM Office of Quality Assurance and Quality Control (QA/QC) will independently review the EM line programs' implementation of guidance for preparing and validating cost estimates for this Five-Year Plan. This will be accomplished by examining their process and performing independent check estimates on a sample of the EM projects. The EM line programs have primary responsibility for implementing the cost validation process. This combined effort will help to improve the cost-estimating process and determine the realism, completeness, and consistency of the cost projections. Section 1.4.6.1 outlines how QA/QC will complete the internal validation process.

The final set of initiatives involves the implementation of effective program and project management systems. These initiatives can be grouped into three categories: (1) development

of program management guidelines and procedures; (2) implementation of systems for prioritizing activities and for managing the cost, schedule, and technical baselines; and (3) establishment of a system for tracking and evaluating EM program accomplishments.

Effective Program Planning: EM has designed its planning process to effectively manage its programs. Main components of the process include a clearly communicated strategic plan, roadmaps that are tools to aid issue-oriented planning, active external review and public participation, and a solid interface with budgeting and program execution (Figure 2).

EM has launched several initiatives to establish better planning, budgeting, and control systems for its programs. These initiatives are united by the philosophy that sound short- and long-term planning should guide management and budgetary decision making and that setting clear program priorities is essential to the success of EM's mission.

The EM 5-year planning process has three main parts: strategic planning, program planning, and installation planning. These processes culminate each year in the development of a Five-Year Plan. The integration of a strategic plan into this Five-Year Plan represents an effort to relate long-term goals and objectives to near-term program proposals. It provides EM with a shared vision of the future and the organization's overall mission, and it specifies goals and objectives against which program progress can be gauged. It also delineates strategies for overcoming the obstacles, such as infrastructure constraints, that might impede the success of EM programs.

Strategic planning activities are augmented by program planning activities that transform EM goals and strategies into detailed Five-Year Program Plans. Installation Summaries specify activities and milestones at the local level. These summaries are presented in the final section of this year's Five-Year Plan. Finally, Site-Specific Plans (SSPs) are developed by individual sites to provide the detailed planning for activities at each installation. The SSPs round out the 5-year planning process.

There are many inputs into EM's tiered and integrated planning processes—both at Headquarters and in the field. The most notable are ADSs and, as previously indicated, roadmaps. ADSs provide project-level information about the scope of work, priority and funding levels, regulatory drivers, etc. ADSs are then grouped—according to program goal—into Activity Packages (APs). Together, the ADSs, APs, and roadmaps form the basis for multiyear program planning.

These ADSs are categorized using a four-tiered prioritization system that emphasizes risk reduction and compliance with IAGs and applicable environmental statutes and regulations. In addition, more specific prioritization processes for each program are applied to ensure resources are focused on those activities necessary to prevent near-term adverse impacts on workers, the public, and the environment. EM is also piloting a risk-based budget initiative with the Office of Management and Budget. In FY 1991, EM will test the risk-based budgeting concepts on 24 environmental projects.

Roadmaps, which are developed at the installation level, constitute detailed analyses of issues that affect EM's ability to achieve long-term goals. While strategic planning is generally

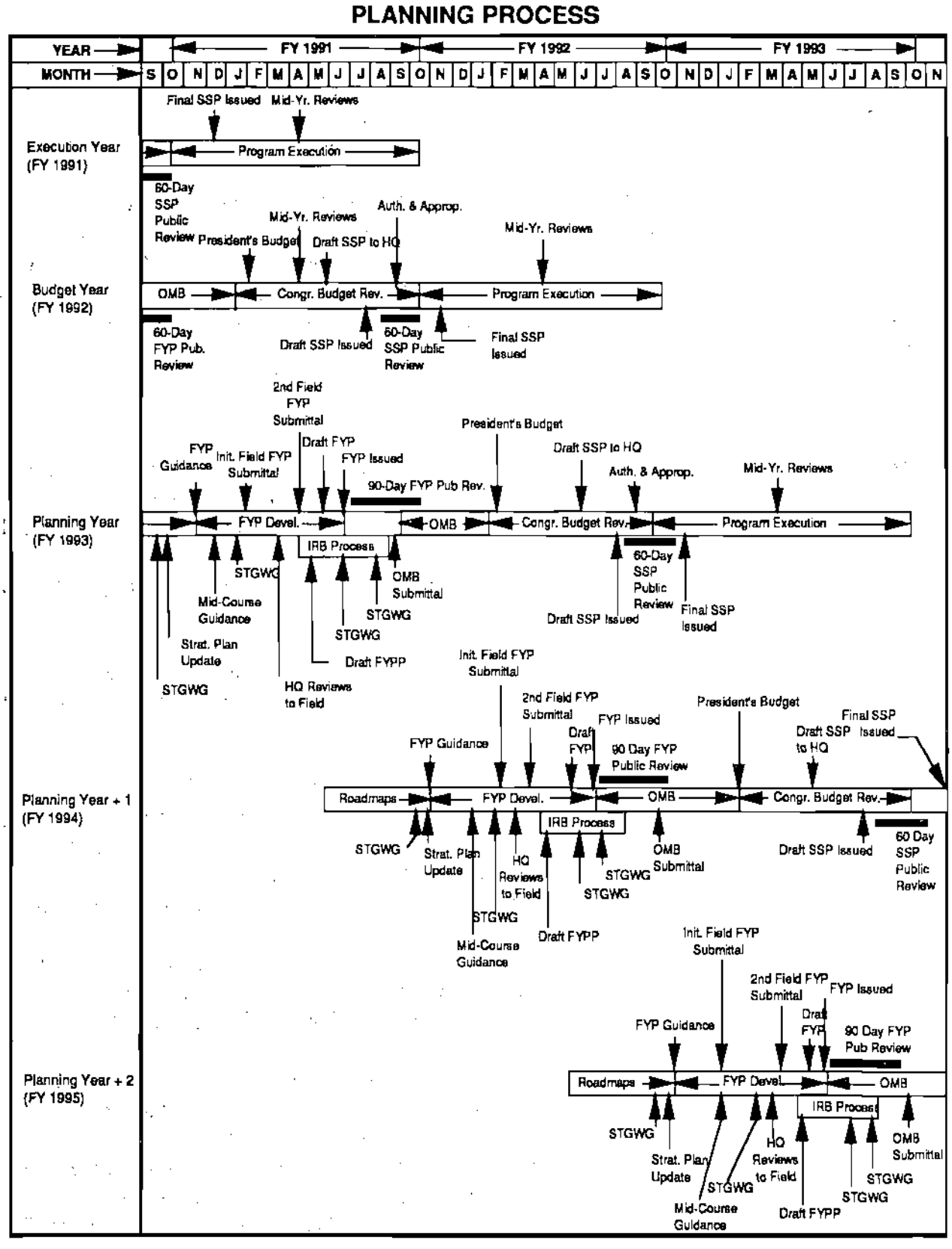


Figure 2. The integrated planning budget and control system identifies major milestones in the development and execution of the annual EM programs. (SSP = Site-Specific Plan, FYP = Five-Year Plan, FYPP = Five-Year Program Plans, STGWG = State and Tribal Government Working Group, IRB = Internal Review Budget).

top-down in orientation and relatively general in focus, roadmapping approaches long-range planning from the bottom up. Accordingly, roadmapping is much more detailed and concrete than conventional strategic planning and provides a method of identifying strategic issues that can be addressed through more conventional top-down strategic planning. Both planning approaches are important to the accomplishment of EM's 30-year goal.

The development of roadmaps for the Rocky Flats Office, the Hanford Single-Shell Tanks, the Idaho Buried Waste Program, and the Feed Materials Production Center is an important initial step. The roadmapping process helped these facilities develop a refined understanding of the issues that could affect progress, their root causes, and the strategies needed to accomplish long-term EM goals. Roadmaps for all installations are expected to be completed by the end of FY 1992.

EM PROGRAM EXECUTION

Near-Term Program Milestones: While EM has made significant progress since its creation 18 months ago, much effort remains before EM's 30-year goal is completed. EM's plans for achieving major cleanup and compliance objectives over a 5-year planning horizon are reflected in the activity and milestone charts for more than 30 installations. These charts are visual representations of the integrated effort at each site, showing interrelationships among Corrective Activities, ER, Waste Operations, and Technology Development.

A National Progress Chart has also been developed to present the most important planned milestones for the EM program for FY 1990-1997 (Figure 3). This National Progress Chart will be updated annually as a part of the cyclical EM planning process.

Key ER FY 1993-1997 milestones reflect (1) starting and completing Remedial Investigations/ Feasibility Studies to characterize wastes at inactive and surplus sites and facilities; (2) initiating and completing environmental cleanups (including 24 UMTRA Projects); and (3) completing interim actions to stabilize waste and stop additional groundwater contamination. Key Corrective Activities and Waste Operations milestones include (1) completing all activities to bring DOE facilities into full compliance or under compliance agreements; (2) constructing needed radioactive waste storage and treatment facilities for high-level, TRU, low-level, and hazardous wastes; and (3) disposing of wastes. Technology Development milestones relate to the IDs and work force support required to achieve the ER and Waste Operations milestones.

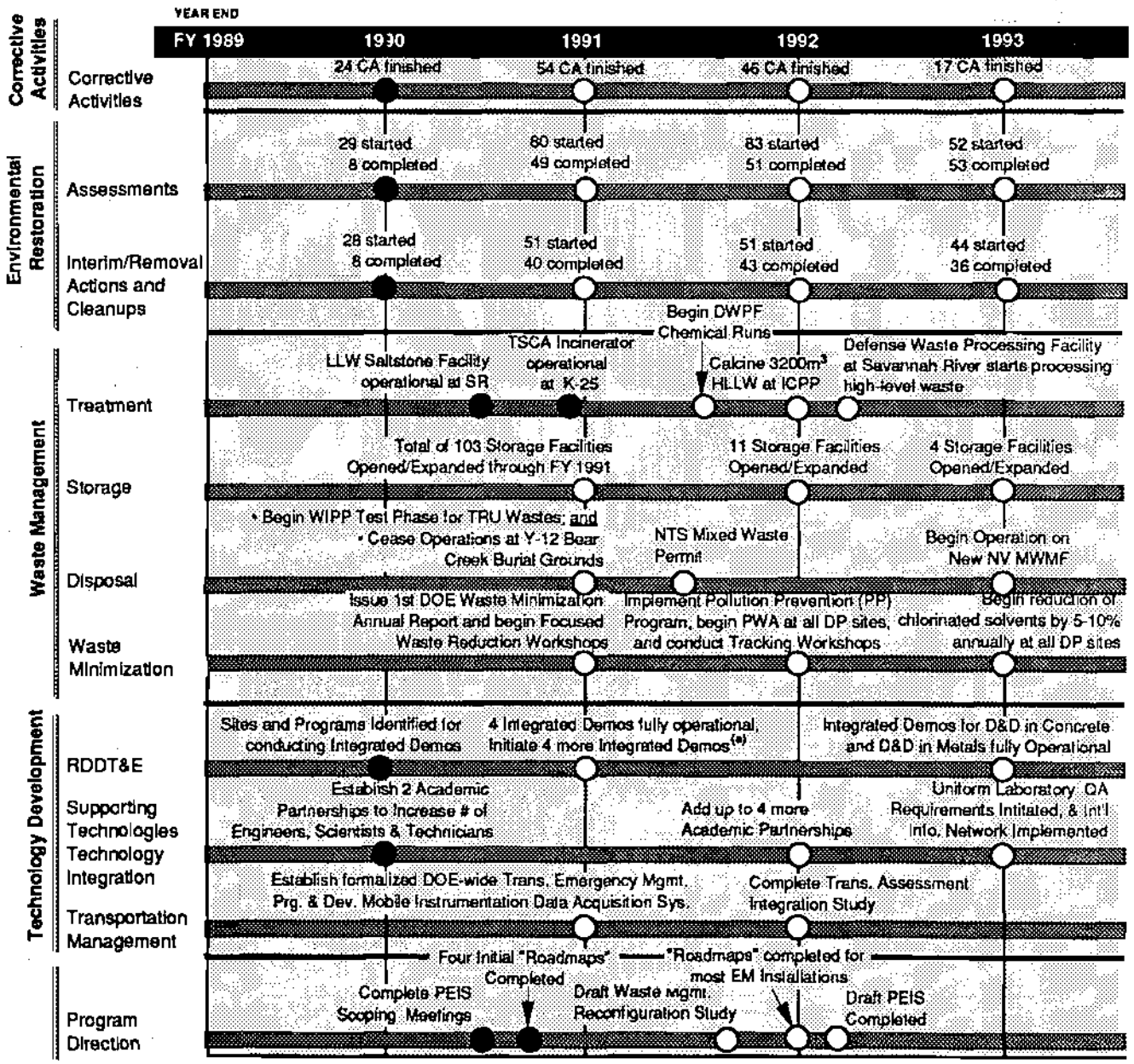
The milestones identified for Environmental Restoration, Waste Operations, and Technology Development are consistent with EM's overall approach to accomplishing its goals and objectives as depicted above in the National Planning Chart (Figure 1). The ER milestones identified in the National Progress Chart (Figure 3) display an initial emphasis on assessing the extent and nature of contamination as well as closures and interim remedial actions necessary to remove the sources of contamination. Corrective Activities milestones focus on bringing DOE site operations into compliance with the letter and spirit of all applicable Federal and State environmental statutes and regulations.

National Progress Chart for Environmental Restoration and Waste Management Program*

* Progress (scope and schedule) shown is projected based on Validated Target Level

Five-Year (FY 1993-1997) Objectives:

- Complete Corrective Activities by FY 1997
- Complete over 150 assessments
- Complete over 130 cleanup and interim/removal actions
- Initiate high level waste treatment
- More than 100 storage facilities opened/expanded
- Determine suitability of WIPP for TRU waste disposal
- Obtain RCRA compliance for mixed waste
- Initiate cleanup at all installations
- Bring DOE sites in compliance with all applicable laws, regulations, and agreements



(a) Operational Demos are Volatile Organic Compounds (VOCs) in Saturated Soils, Buried Waste, Environmentally Conscious Manufacturing, & Depleted Uranium; Initiated Demos are Cleanup of Plutonium in Soils, Cleanup of Uranium in Soils, Cleanup of VOCs in Unsaturated Soils, & Underground Storage Tank Remediation

Figure 3. National Progress Chart.

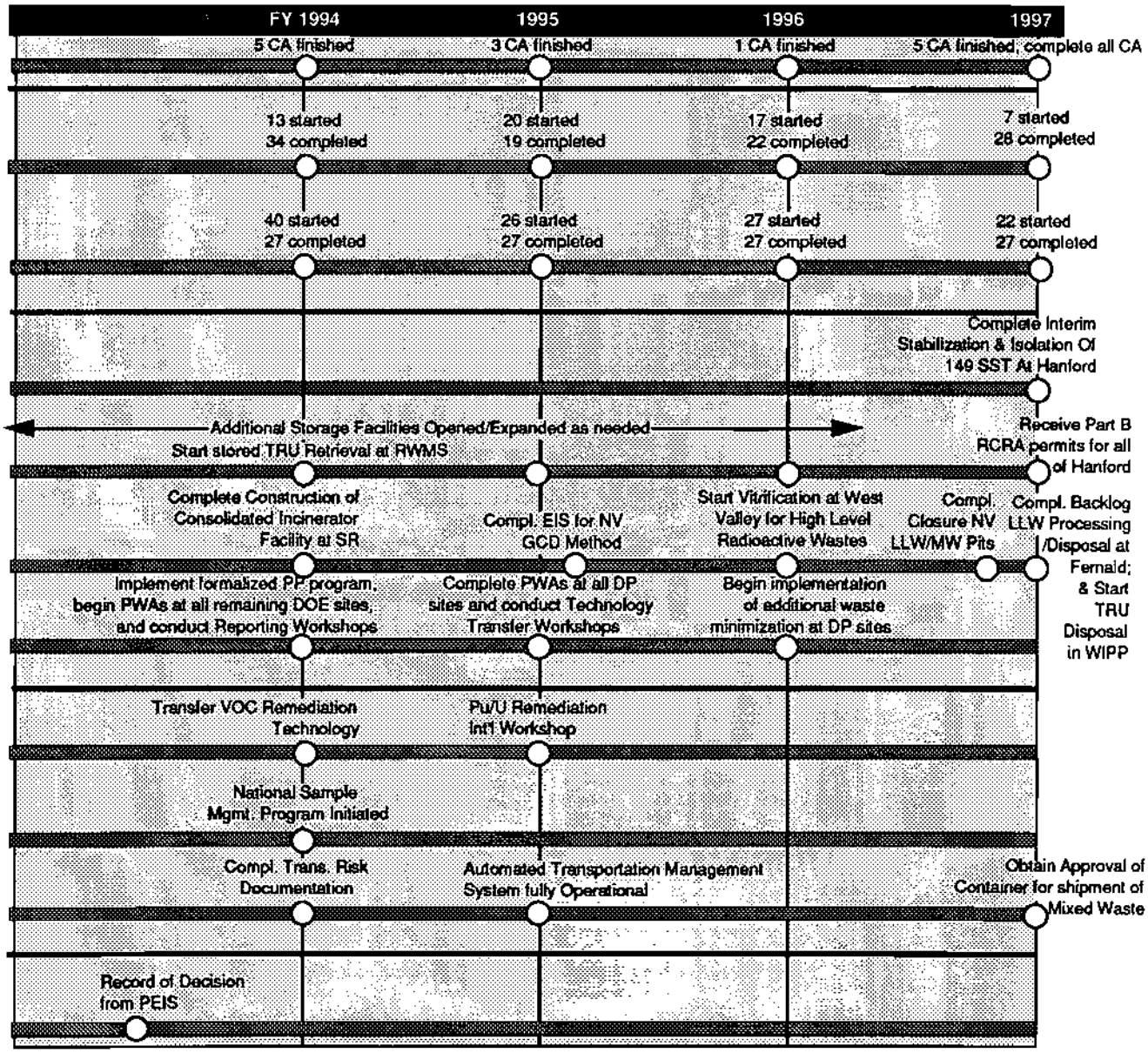
National Progress Chart (continued)

Acronyms

CA–Corrective Activities
D&D–Decontamination & Decommissioning
DP/EM MOU–Defense Programs/ EM Memorandum of Understanding
EIS–Environmental Impact Statement
FMPC–Feed Materials Production Center
GCD–Greater Containment Disposal
HLLW–High-Level Liquid Waste
ICPP–Idaho Chemical Processing Plant
LLW–Low-Level Waste
MW–Mixed Waste
MWMF–Mixed Waste Management Facility
NTS–Nevada Test Site
NV–Nevada
OU–Operable Units
PEIS–Preliminary Environmental Impact Statement
Pu/U–Plutonium/Uranium
PWA–Process Waste Assessment
QA–Quality Assurance
RCRA–Resource Conservation & Recovery Act
RDDT&E–Research Development Demonstration Testing & Evaluation
RI/FS–Remedial Investigation/Feasibility Study
RWMS–Radioactive Waste Management Site
SR–Savannah River
SST–Single Shelled Tanks
TRU–Transuranic
TSCA–Toxic Substances Control Act
UMTRA–Uranium Mill Tailings Remedial Action
WIPP–Waste Isolation Pilot Plant

Legend

Planned Milestones (milestones explanations above milestones)
Completed Milestones
Activities



Note: Because this chart does not identify all activities, see Section 3 of FY 1993-1997 Five-Year Plan for additional milestones.

Figure 3. National Progress Chart (Continued).

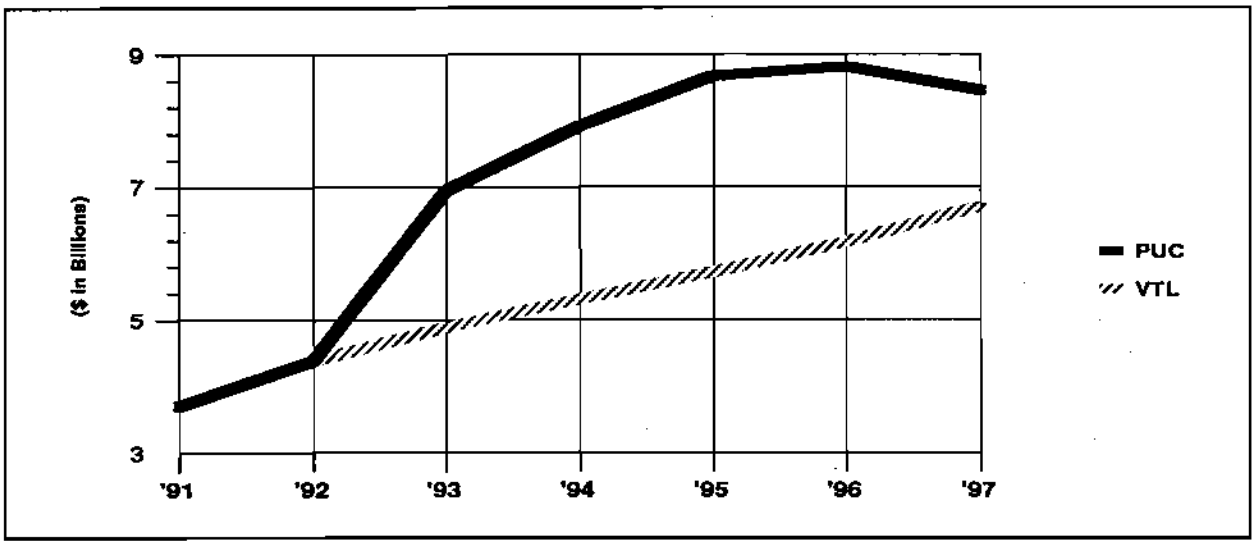
Waste Management milestones display a near-term emphasis on ensuring adequate storage capacity for existing waste, on minimizing the generation of new waste, and on developing and testing facilities for the treatment and permanent disposal of waste. As mentioned earlier, treatment facilities for high-level wastes are being constructed at Savannah River and West Valley and planned and designed at Hanford and the Idaho National Engineering Laboratory. During the 5-year period ending in FY 1997, the DWPF at Savannah River (FY 1993) and the West Valley Demonstration Project (FY 1996) are scheduled to begin vitrification. WIPP has been constructed for research and development of the disposal of TRU wastes currently stored at 11 sites.

Low-level waste treatment will occur at a number of sites. Two incinerators are operating (the Waste Experimental Reduction Facility Incinerator at the Idaho National Engineering Laboratory and the Toxic Substances Control Act Incinerator in Oak Ridge) and one additional incinerator is planned for Savannah River (construction begins in FY 1994). The Savannah River Saltstone Facility and the Richland Grout Treatment Facility will solidify LLLW into stable waste forms for disposal.

RDDT&E technology development milestones initially focus on demonstrating technologies for site investigation and remediation. In FY 1991, the fully operational IDs are: (1) in the Groundwater and Soils Cleanup area—VOCs in Saturated Soils; (2) in the Waste Retrieval and Waste Processing area—Buried Waste; and (3) in the Waste Minimization and Waste Avoidance Applications area—Environmentally Conscious Manufacturing and Depleted Uranium Waste Minimization. In FY 1992 four additional IDs are planned to be fully operational. These IDs are directed at the cleanup of groundwater and soils, the cleanup of plutonium in soils, the cleanup of VOCs in unsaturated soils, and in waste retrieval and waste processing applications. In FY 1993, two IDs for D&D will become fully operational, one for metals and the other for concrete.

The accomplishment of these and other planned milestones will set the stage for EM activities and accomplishments well into the 21st century.

Alternative EM Program Funding Cases: Sound management requires prudent planning for fiscal and personnel resources and the development of technologies to get the job done. The first EM Five-Year Plan contained estimates of cost for FY 1991-1995. As the Plan is updated annually, so are the funding estimates. Comparison of the estimates for the FY 1993 work scope that were developed in 1989 and those contained in this Plan reveals significant cost increases. Most of the increase was reflected in the second Five-Year Plan. However, an additional $400 million increase is reflected in this third Plan. Much of this increase can be attributed to increased responsibilities in areas not envisioned in the first Plan. These increased responsibilities include recognition of the need for support structures to accomplish the EM mission such as a new technology development program, Federal program direction, and Agreements-in-Principle. Other responsibilities derive from EM's (D&D) responsibilities for surplus or inactive facilities. These responsibilities include the management of an increasing number of facilities that are in transition to the D&D effort. In this Plan, a number of facilities in Hanford and the entire Fernald Site are included. The estimates for completing the original mission for EM show that the estimates for that effort rose sharply in the second Plan but fall in this third Plan. This decrease represents the result of a number of EM initiatives that have been undertaken to control cost growth since the second Plan was developed.



Preliminary Unvalidated Case-Total Dollars (Billions)								
PRIORITY		1991	1992	1993	1994	1995	1996	1997
1	SUBTOTAL	2.85	3.19	4.83	5.24	5.32	5.30	5.05
2	SUBTOTAL	0.53	0.74	1.36	1.62	2.00	2.20	2.23
3	SUBTOTAL	0.30	0.43	0.71	0.99	1.23	1.19	1.05
4	SUBTOTAL	0.006	0.011	0.026	0.057	0.097	0.11	0.056
	GRAND TOTALS	3.7	4.4	6.9	7.9	8.7	8.8	8.4

Validated Target Level-Total Dollars (Billions)								
PRIORITY		1991	1992	1993	1994	1995	1996	1997
1	SUBTOTAL	2.85	3.19	3.53	3.64	3.75	4.06	4.47
2	SUBTOTAL	0.53	0.74	0.89	1.02	1.15	1.30	1.37
3	SUBTOTAL	0.30	0.43	0.46	0.62	0.71	0.76	0.84
4	SUBTOTAL	0.006	0.011	0.009	0.016	0.026	0.032	0.019
	GRAND TOTALS	3.7	4.4	4.9	5.3	5.7	6.2	6.7

Figure 4. Funding projections for EM Program and priorities, PUC, and VTL. Includes funding from defense and non-defense accounts and uranium enrichment.

Future Roadmapping Efforts: During the 18 months of its existence, EM concentrated its resources on establishing the foundation necessary to complete its long-term, 30-year mission. EM identified short-term objectives, assessed the amount of work that had to be done, established agreements for bringing the DOE complex into compliance with Federal and State laws and regulations, and initiated the development of technologies that are critical to long-term remediation and restoration activities.

With critical organizational, management, and planning structures now in place, EM can take a more integrated and comprehensive look at the issues that need to be resolved in order to ensure the program's ultimate success. Over the next 18 months, a major initiative—which is appropriately named roadmapping—will be undertaken on an EM-wide basis. The roadmaps discussed above were pilot activities designed primarily to test the viability of this planning methodology. Roadmaps for all installations are expected to be completed by FY 1992. These roadmaps will identify the steps EM must take to meet its 30-year cleanup goal.

The FY 1993-1997 Five-Year Plan presents two planning cases, the Validated Target Level (VTL) and the Preliminary Unvalidated Case (PUC).

The Validated Target Level (VLT) provides a 10 percent annual increase for the defense-related EM program. This growth rate far exceeds that of any other defense-funded program within DOE. The program grows at 10 percent per year even in the context of declining statutory caps for the overall defense category which were insisted upon by Congress. Under this case, consistent with the EM prioritization philosophy, Priority 1 activities would be funded at the largest percentage of the PUC discussed below. Priority 4 activities would receive the lowest percentage of the field office requested funding.

The PUC represents a preliminary estimate of funding: to ensure protection of the public and worker health and safety, to carry out the agreements entered into by DOE, to ensure compliance with applicable environmental requirements, and to implement other desired improvements. These activities are consistent with Priorities 1, 2, 3, and 4 of the EM prioritization system. Priority 1 activities are those necessary to prevent near-term adverse impacts on workers, the public and the environment, in addition to ongoing activities that, if terminated, might have significant adverse impact. Priority 2 activities are required to meet the terms of agreements (in place or in negotiation) between DOE and Federal, State or local agencies. Priority 3 activities are required for compliance with environmental regulations not covered by Priorities 1 and 2. Desirable activities that are not explicitly required by regulation are Priority 4 activities.

Neither the PUC nor the VTL reflects the actual amount of money that will be allocated to the EM Program between FY 1993 and FY 1997. Actual funding will depend upon further priority setting in the context of the annual budget and appropriations process.

The funding estimates for these two cases are presented in Figure 4. The figure covers FY 1991-1997 and includes funding projections for each of the four priority categories.

A comparison of the two funding cases illustrates the significance that EM places on reducing risk and meeting its agreement commitments. Consistent with EM prioritization philosophy, the largest percentage reductions from the PUC to the VTL occurred for Priority 4 activities and the lowest percentage reductions were for Priority 1 activities. Both planning cases reflect actual or anticipated transfers of facilities from Defense Programs (DP) to the EM program.

EM is not the only DOE program that has responsibilities for waste management activities throughout the nuclear complex. As generators of hazardous, radioactive, and mixed waste, program offices such as DP, Nuclear Energy (NE), and Energy Research also conduct waste management activities. These activities include waste accumulation, characterization, labelling, packaging, storage, and minimization. The program offices also conduct corrective activities to remediate situations under Notices of Violation from regulatory authorities. These activities are managed by the cognizant program office, and funding for the activities is provided by the respective program office. For FY 1993 approximately $130M is planned by other DOE program offices for waste management and corrective activities. This amount represents only those activities that were identified during the early phase of the preparation for this Five-Year Plan and may not be all-inclusive.

The roadmapping effort is also being expanded to provide information useful to the management of the national programs. The first of which is the Low-Level Radioactive Waste Roadmap (LLRWR). The LLRWR addresses what will be necessary to treat, store, and dispose of low-level/mixed waste. One of the biggest unknowns in the management of low-level waste is the nature and volume of wastes that will be generated by the restoration program. The completion of the ER Roadmaps will benefit this effort as well. A Transportation Roadmap will also be constructed to ensure that issues involved with the safe transport of waste to treatment, storage, and disposal facilities are reconciled with the production and handling aspects of waste management and cleanup.

The roadmapping process will be repeated for other major waste types and program areas. Distillation and analysis of the various site and program roadmaps will yield the National Environmental Restoration and Waste Management Roadmap. This roadmap will synthesize the major issues to be resolved and steps to be taken in order to achieve the 30-year cleanup goal.

EM's VISION OF THE FUTURE

EM was created out of the recognition that a significant national effort had to be launched to clean up 45 years' worth of environmental pollution from the design and manufacture of nuclear materials and weapons. EM's programs were charged with treating and disposing of the stored inventory of radioactive and chemically hazardous waste, developing a technology to achieve those goals, and implementing a new organizational culture founded on the principles of openness, responsiveness, and accountability. The institution of this new organizational culture should prevent this Nation from ever having to face an environmental problem of this character and size again.

EM expects that 30 years of persistent effort, coupled with early and successful technology development, will find the United States in a position of world leadership in environmental services and waste management activities. U.S. companies will successfully apply their experience internationally, by cleaning up contaminated facilities, restoring sites and facilities to environmental compliance, and managing waste worldwide. Indeed, for environmental services and waste management solutions, the world will look to the United States for leadership and advice.

Today, EM is taking actions designed to realize this vision of the future. While many challenges remain, the commitment to early public participation, the emphasis on concrete accomplishments, and the implementation of effective management and planning systems greatly increase the likelihood that EM will successfully complete its critical national mission.

ENVIRONMENTAL RESTORATION & WASTE MANAGEMENT

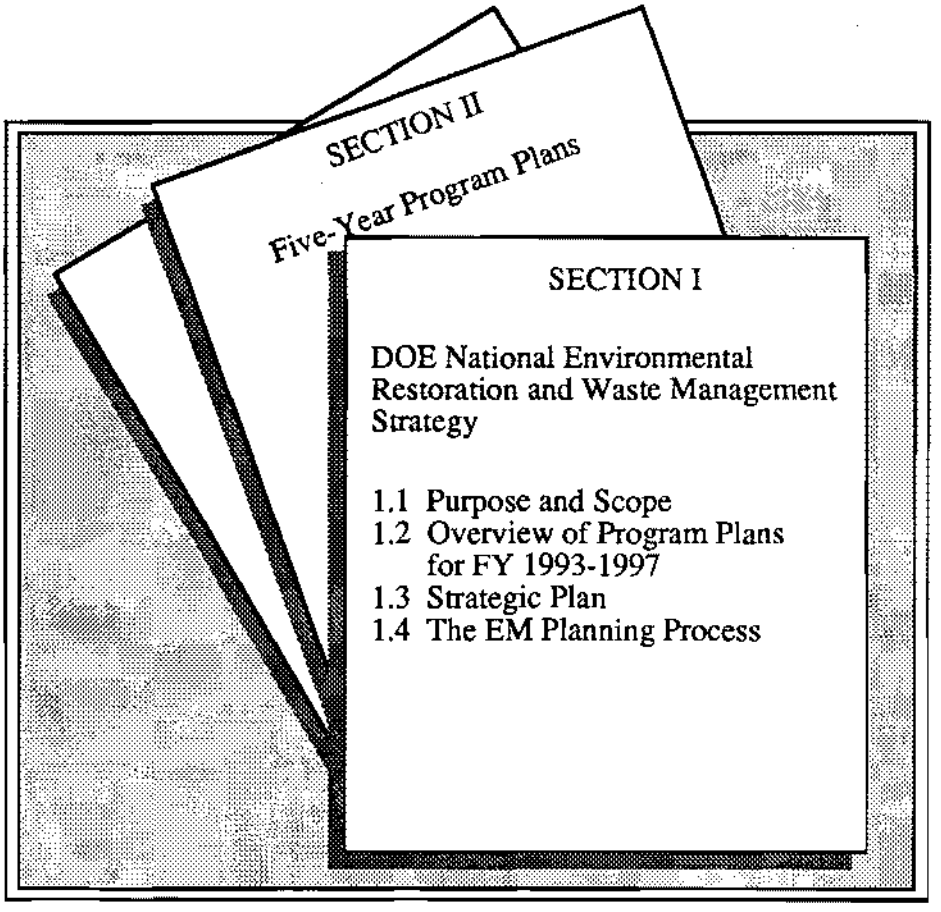
DOE National Environmental Restoration and Waste Management Strategy 1993-1997

SECTION 1

August 1991

1.1

Purpose and Scope



The Five-Year Plan: Purpose and Scope

1.1 PURPOSE AND SCOPE

Supported by programmatic and installation-level detail, this document reports on progress to date toward meeting compliance and cleanup goals and sets overall long-term strategy and near-term plans for mission accomplishment.

Plan Purpose—Implement Overall Strategy: This Five-Year Plan moves the Office of Environmental Restoration and Waste Management's (EM's) planning process one step closer to 2019—by which time EM intends both to have been long operating all facilities in full compliance with applicable laws and regulations and to have completed the cleanup of the 1989 inventory of contaminated inactive sites and facilities.

As discussed in this plan, the overall EM strategy for reaching its 30-year goal has three parts. First, where performance-based risk assessment shows an actual or potential threat to human health and safety, **do** immediately whatever is possible to reduce, mitigate, stabilize, and confine the threat. Second, where nobody knows how to solve a problem (as distinct from merely preventing it from getting worse), **act** decisively to develop methods to do it right the first time. Third, where compliance and cleanup must proceed with or without next-generation technologies, **plan**, with vested parties and within the provisions of Interagency Agreements, to specify the work to be accomplished and the schedule for its accomplishment.

This Plan continues annual presentation of EM's plans for achieving major cleanup and compliance objectives over a 5-year planning horizon. Like earlier plans, it includes a detailed description of major program elements (Corrective Activities, Waste Operations, Environmental Restoration, Technology Development, and Transportation) and provides summaries for all sites and facilities in the Department of Energy (DOE) complex with environmental restoration and waste management responsibilities. EM's fundamental commitment to a program culture based on openness and responsiveness to the concerns and issues raised by external parties and the general public is also reaffirmed and expanded.

This Plan is distinguished from previous Five-Year Plans in several notable ways:

It shifts EM's emphasis from good intentions to concrete accomplishments: EM's purpose is not to function as a public works program for technical and scientific professionals, but to achieve concrete, permanent solutions to the massive environmental waste management and cleanup problems facing the DOE complex. Consequently, reporting accomplishments and commitments is integral to this Plan. Major accomplishments are discussed at a broad level in Section 1.2.1 and throughout the program-specific discussions in Section 2. The National Progress Chart included in Section 1.2.5 depicts key EM commitments over the planning period. More specifically, the Section 3 Installation Summaries include Progress Charts depicting near-term and long-term objectives for each installation and associated milestone commitments designed to meet those objectives, as well as concise discussions of major accomplishments to date.

The discussion of program accomplishments and milestones in the Installation Summaries reflects a much more integrated approach to program planning than was possible in previous plans. Still, the political, regulatory, and technological obstacles to mission accomplishment are considerable, as the Office of Technology Assessment report, *Complex Cleanup* (February 1991), makes abundantly clear. A point-by-point discussion of this report may be found in Section 1.3.5.1.

It incorporates an explicit strategic plan: This Five-Year Plan integrates the Secretary's strategic planning requirements into overall program planning processes and activities. Section 1 of the Five-Year Plan addresses broad, long-term strategic considerations in line with the overall strategy noted earlier (including a vision statement, a mission description, program philosophy, a situation analysis, and program goals, objectives, and strategies). It also provides a summary of EM accomplishments to date and of near-term plans. The Five-Year Program Plans are presented in Section 2, and the detailed activity and milestone charts for the more than 30 DOE installations are displayed in Section 3. This tiered approach to planning, which starts with broad general objectives and concludes with detailed installation descriptions and progress charts, represents a substantial improvement over earlier 5-year planning efforts. Summaries for Technology Development (including Education) and Transportation continue to be provided by emphasis area and appear in Section 3.

This document also expands on a state-of-the-art planning and decision-aiding methodology called "roadmapping," first introduced in last year's Five-Year Plan. This methodology is used to integrate short- and long-term objectives and detailed installation objectives with broad programmatic and strategic objectives. More precisely, roadmaps describe the activities to be done and the issues to be resolved to achieve long-term EM goals and objectives. This Plan provides an overview of initial roadmapping for Rocky Flats, the Hanford Single-Shell Tanks, the Idaho Buried Waste Program, and the Feed Materials Production Center. EM intends to expand the roadmapping process to more installations and to begin integrating installation-level roadmaps on a national basis.

It reflects expanded public involvement in program planning: Realizing the importance of external involvement in program planning, EM sought review and comment by external groups on earlier Five-Year Plans. Reviews by external parties, at both the national and field office levels, have been the most obvious example of EM's commitment to a new, more open culture.

This Plan reflects an expanded understanding of the importance of early public involvement in EM program planning. EM listens to and takes seriously the comments and concerns of external parties. For example, in response to comments made by members of the State and Tribal Government Working Group, EM has greatly expanded opportunities for predecisional involvement in program planning. This Plan chronicles EM's continuing movement toward predecisional public involvement activities.

It recognizes the importance of affected Indian Tribes: This Plan addresses the importance of potentially affected Indian Tribal governments. Attention is given to the importance of establishing effective working relationships with Tribal jurisdictions that are affected by EM program planning decisions, including activities such as the transportation of radioactive and hazardous wastes. Additionally, this Plan discusses the importance of providing educational assistance and training to Indians on and off reservations to enable them to participate fully in planning and monitoring EM activities and to help meet current and future DOE work force requirements.

It reflects EM's commitment to controlling costs: This Plan discusses cost control in terms of new ways to estimate and validate costs, the use of prioritization methodologies to manage future cost growth, the importance of technology improvements to accomplish program aims more efficiently, and the application of new program-level initiatives to reduce overall program costs.

Evolving Scope of EM Mission: A complete list of the sites, facilities, and programs that fall within the scope of this Plan is given in Appendix A of this Plan. Since the publication of the FY 1992-1996 Five-Year Plan, production activities have significantly decreased at the Hanford Reservation near Richland, Washington, and all such activities have ceased at FMPC in Fernald, Ohio. These installations now report directly to EM, with environmental compliance and cleanup their long-term mission.

In response to both a changing strategic climate and to DOE's plans for the reconfiguration and modernization of the nuclear weapons and waste management complexes, other sites and facilities will undergo a change of mission from production to environmental restoration and waste management. Section 1.3.6.3 outlines the process by which DOE will transfer these facilities to Environmental Restoration and Waste Management. This process is designed to ensure that such transfer does not fiscally or otherwise impede EM's ability to meet its 30-year goal. These plans and the EM Programmatic Environmental Impact Statement (Section 1.4.4.3) will be developed with public participation, as DOE makes good on its commitment to change from a "Trust me" to a "Watch me" culture.

EM still has a significant distance to go before the accomplishment of its national mission is ensured. Nevertheless, this Plan illustrates EM's progress toward doing things "faster, safer, better, and cheaper." Most important, however, this Plan reaffirms EM's willingness and ability to establish effective, comprehensive, and participatory planning processes.

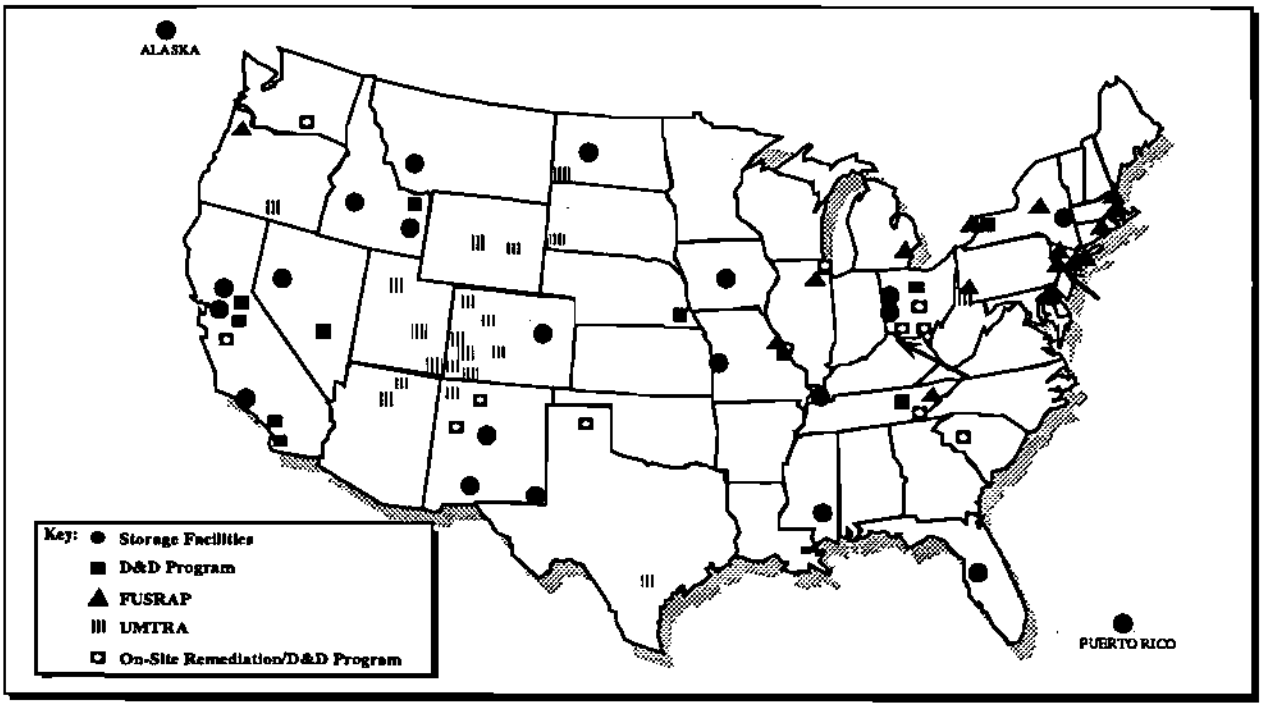


Figure 1.1. Environmental Restoration sites are discussed in detail in the Installation Summaries in Section 3. (D&D = Decontamination and Decommissioning, FUSRAP = Formerly Utilized Sites Remedial Action Program, UMTRA = Uranium Mill Tailings Remedial Action).

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1.1.1 HOW THIS PLAN WAS DEVELOPED

The FY 1993-1997 Five-Year Plan is the main output of EM's integrated planning process. This process, which involves Headquarters and field personnel at all levels, is intended to translate clear, specific programmatic goals and objectives into environmentally sound results.

Development of the EM Strategic Plan: Section 1.3 of this Five-Year Plan contains the EM strategic plan. This strategy was initially developed in the fall of 1990 as part of the requirements of the Secretary of Energy's Strategic Planning Initiative (SEN-25-90). The EM strategic plan sets forth the EM mission, long-term goals and objectives, major issues, and strategies for resolving them. It is intended to drive planning and decision making at the program level, and it will be updated on an annual basis.

Developing Funding Scenarios: The EM programs discussed in this Five-Year Plan are based on two funding scenarios. They are based on the previous Five-Year Plan; DOE Agreements with State and local governments; Tiger Team assessments; special reports such as the Office of Technology Assessment's (OTA's) report, *Complex Cleanup*; input from external interests; and other sources.

Activity Data Sheets (ADSs), which provide detailed information about the scope, funding, regulatory drivers, and other data about EM activities, form the basis for planned funding scenarios. ADSs are developed by field offices in consultation with Headquarters Program Managers. Organized into goal-oriented modules called Activity Packages (APs), Headquarters reviews field submissions to ensure adequate funding of priority projects, eliminate duplication, and ensure consistency across sites. Summary information about activities at each site are provided in the Installation Summaries (Section 3).

Field Identifies Wants: The Preliminary Unvalidated Case (PUC) establishes an EM programmatic plan based on a preliminary estimate of funding: to ensure protection of the public and worker health and safety, to carry out the agreements entered into DOE, to ensure compliance with applicable environmental requirements, and to implement other desired improvements. These activities are consistent with the EM Prioritization System that classifies activities by four priority categories. The highest priority activities are those necessary to prevent near-term adverse impacts on workers, the public and the environment, in addition to ongoing activities that, if terminated, might have significant impact. The second priority are those activities required to meet the terms of agreements (in place or in negotiation) between DOE and Federal, State, or local agencies. The third priority are those activities required for compliance with environmental regulations not covered by Priorities 1 and 2. Desirable activities that are not explicitly required by regulations are fourth priority planning activities.

Headquarters Provides Guidance for Validated Target Level: The Validated Target

Level (VTL) provides a 10 percent annual increase for the defense-related program. This growth rate far exceeds that of any other defense-funded program within DOE. The program grows at 10 percent per year even in the context of declining statutory caps for the overall defense category which were insisted upon by Congress. The milestones in this Plan represent an EM program funded at the Validated Target Level. Under this case, consistent with the EM prioritization philosophy, Priority 1 activities would be funded at the largest percentages of the Preliminary Unvalidated Case (PUC).

Neither the PUC nor the VTL reflects the actual amount of money that will be allocated to the EM Program between FY 1993 and FY 1997. Actual funding will depend upon further priority setting in the context of the annual budget and appropriations process.

Field and Headquarters Input: EM planning efforts take place both at Headquarters and in the field (Figure 1.1.1). They are directed by senior management and carried out by staff at all levels of the organization. The Director of the Five-Year Plan works with Planning Officers from each program and field office to coordinate planning activities across the DOE complex. An integration team consolidates the many separate components of the Plan. Parts of DOE outside of EM, such as the Office of Environment, Safety and Health; the Office of General Counsel; the Office of Defense Programs; and several others have participated in the development of the Plan.

External Involvement: There are many opportunities for external involvement in EM's planning process, and the Plan has been significantly improved by the participation of external groups. As each field office developed its PUC, for example, it held public meetings to discuss the purpose and scope of proposed projects. The State and Tribal Government Working Group (STGWG) and the Stakeholders' Forum also contribute to the development of the Plan. Both groups reviewed the draft Plan, and their comments on it and on EM's planning efforts are incorporated on an ongoing basis. Post-publication comments on the Five-Year Plan are responded to in a comment-response document and incorporated into the next cycle.

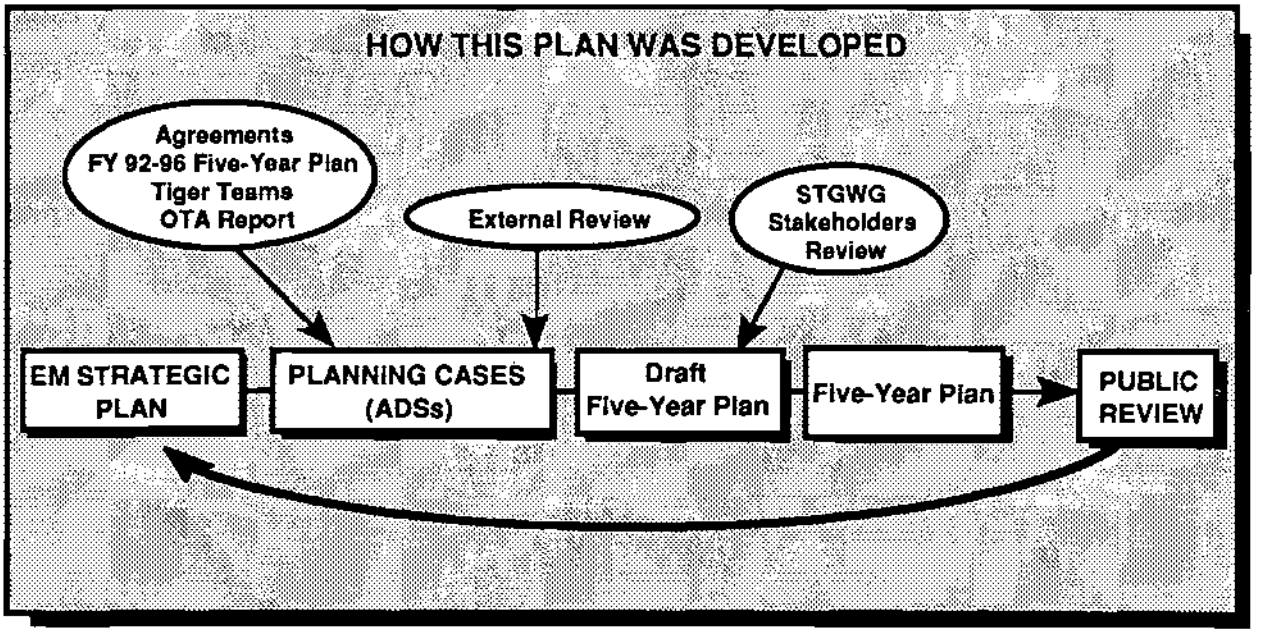


Figure 1.1.1 The Five-Year Plan is developed by both Field Offices and Headquarters over a 12- month period.

1.1.2 DIVISION OF RESPONSIBILITY AMONG DOE PROGRAM OFFICES FOR WASTE MANAGEMENT AND CORRECTIVE ACTIVITIES.

Each DOE program office is responsible for all operations and/or facilities under their management.

To meet the DOE goal of achieving compliance with applicable laws, regulations, and agreements aimed at protecting human health and safety and the environment at all its sites and facilities, DOE program offices[1] must work together to coordinate waste management activities, corrective activities, and cleanups. The program offices have executed a Memorandum of Agreement (MOA) which defines the responsibilities and interrelationships necessary to carry out the DOE goal. This MOA expires September 30, 1991, and negotiations are currently underway for a new MOA to take effect October 1, 1991.

Consistent with the Secretary's philosophy on the need to establish direct line responsibility within DOE, each program office is responsible for the planning, budgeting, and execution of all operations at facilities under their management that are actively used for production. These operations include waste management and corrective activities. Within this framework, EM is responsible for all DOE facilities, operations, and site (or portions thereof) that:

(a) have been assigned to DOE for environmental restoration and serve or will serve no future production need;
(b) are used for the storage, treatment, or disposal of hazardous, radioactive, or mixed waste that have been properly characterized, packaged, and labelled, but are not used for production;
(c) have been formally transferred to EM by another DOE office for environmental restoration and eventual return to service as a production facility; or
(d) are used exclusively for long-term storage of DOE waste and are not actively used for production, with the exception of facilities and operations under the direction of Office of Civilian Radioactive Waste Management.

In addition, EM is responsible for developing and monitoring the effectiveness of DOE policy related to waste management and for formulating the annual budget requests for activities identified in the Five-Year Plan.

Therefore, EM is responsible for all DOE facilities, operations, and sites that are used for waste management activities for wastes that have been properly characterized, packaged and labelled. For material that is newly designated as waste, the characterization, accumulation, packaging, and labelling is the responsibility of the program office that generates it. EM, with

[1]DOE program offices include Environmental Restoration and Waste Management, Defense Programs, Energy Research, Fossil Energy, Nuclear Energy, New Production Reactors, and Civilian Radioactive Waste Management.

the input of the affected program offices, establishes waste acceptance criteria, and the program office that generates the waste is responsible for preparing the waste in compliance with the criteria.

The program offices responsible for building operations are responsible for waste-related surge tanks located within the facility. They are also responsible for the management of interim waste storage locations (i.e., sites where waste is accumulated for short periods without permit requirements). Operation of sanitary waste facilities requiring operating permits are the responsibility of the landlord.

EM is responsible for uniting the waste minimization activities in DOE into one overall program, as well as the conduct of technology development programs aimed at minimizing waste generation. At the same time, DOE waste generating programs are required to identify opportunities to effect reductions in the amount of waste they generate. Since the waste generating programs are responsible for the costs of preparing waste to meet the EM waste acceptance criteria, it is to their benefit to tailor their processes to produce less waste and waste that is not too difficult or expensive to characterize, package, and label.

In summary, the division of responsibilities among DOE program offices for waste management and corrective activities are as follows:

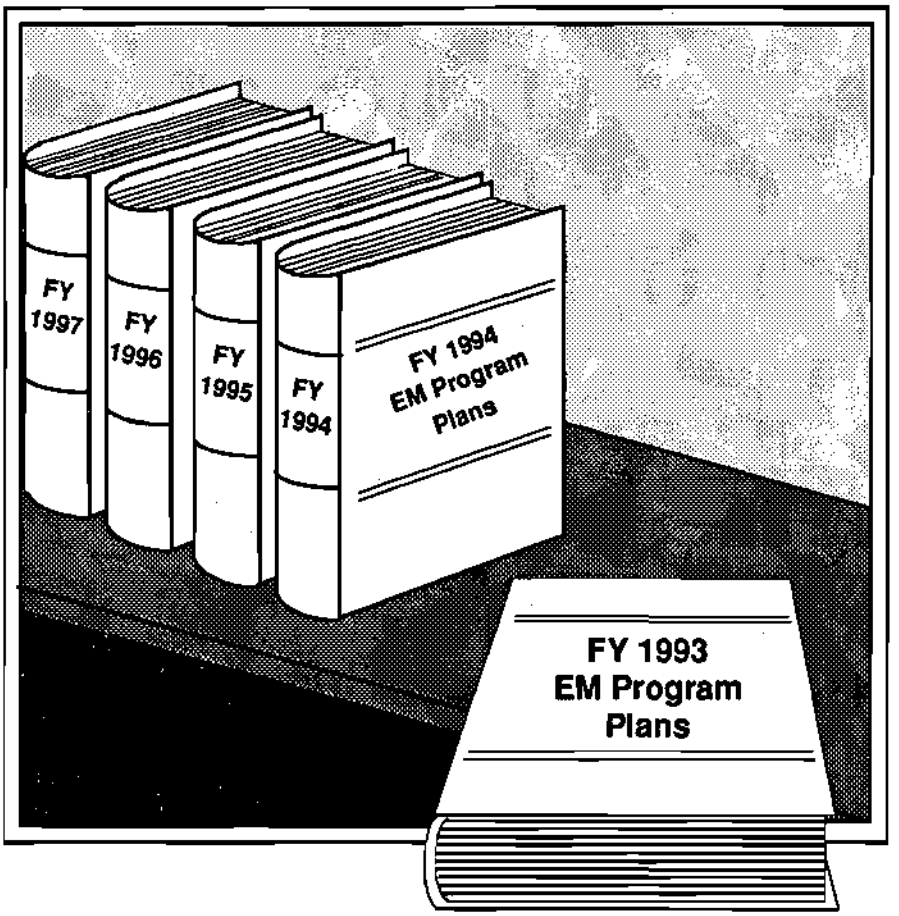
EM manages and funds all waste management and corrective activities involving the treatment, permitted storage, and disposal of hazardous, radioactive and mixed waste at facilities within its operational responsibility throughout the nuclear complex:

EM funds, but the responsible program office manages, all waste management and corrective activities involving the treatment, permitted storage, and disposal of hazardous, radioactive, and mixed waste at facilities within the operational responsibility of the other DOE program offices:

The responsible program office funds and manages all waste generator activities including characterization, accumulation, packaging, and labelling required to meet the waste acceptance criteria for transferring the waste to EM. They are also responsible for the management and funding of site-wide environmental monitoring.

1.2

Overview of Program Plans for FY 1993-1997



The EM Multiyear Program Plans discuss progress to date in the program, near-term objectives, resource planning assumptions, and milestones for critical program efforts.

1.2.1 HOW FAR WE'VE COME: MAJOR ACCOMPLISHMENTS AND SETBACKS AND THEIR SIGNIFICANCE

Since its founding 18 months ago, EM has accomplished a great deal. A great deal more is left to do.

The EM approach to national planning focuses first on completing efforts leading to compliance, stabilization, and the reduction of near-term risk and initiating efforts leading to long-term or permanent solutions (Figure 1.2.1a).

The waste program is focusing on bringing DOE's operations into compliance with environmental laws and regulations and on developing the support structures necessary to manage the Department's waste. Efforts that DOE is undertaking to bring all of its operations, not just EM's, into compliance are referred to as Corrective Activities. As stated in earlier Five-Year Plans, DOE is committed to achieving this compliance goal quickly. Thus, Figure 1.2.1a displays this effort as completed very early on the time line. In the Waste Operations Program, EM is focusing on ensuring adequate, permitted storage capacity for existing waste and on minimizing the generation of new waste. At the same time, EM is constructing and testing facilities for treatment and disposal that are the first of their kind; many will come on-line by the end of the decade. This approach recognizes that treatment and disposal facilities involve long lead times for construction and testing or new Technology Development. Meanwhile, technology development support to the waste program is focusing on new technologies for more efficient and less costly treatment of many of DOE's more exotic waste streams. In Figure 1.2.1a, storage efforts are displayed as prominent in the near term and tapering off as new treatment and disposal facilities come on-line.

The Environmental Restoration Program follows the processes required by the Comprehensive Environmental Response, Compensation, and Liability Act and Resource Conservation and Recovery Act (CERCLA/RCRA). Thus, Figure 1.2.1a displays a near-term emphasis on assessment of the extent and nature of contamination. Closures and interim remedial actions designed to remove the sources of contamination, and thereby stabilize the sites, are also being undertaken in the near term. Full remediation (cleanup) will follow the assessment efforts, with monitoring of the sites continuing upon completion of the cleanup effort. Technology Development support is designed to ensure that new technologies are available as the restoration program progresses. Thus it focuses in the near term on providing technologies for site investigation and for the study of remediation alternatives. Future technology efforts will focus more on treatment, remediation, and stabilization. Toward the end of the Technology Development Program, the emphasis will again shift to techniques for ensuring that the cleanup has been effective.

The nature of EM accomplishments will change with time as the program emphasis changes. Thus today, major accomplishments relate to storage of waste, development of treatment facilities, assessment of environmental releases and their risks, and the development of technologies to support these unprecedented activities. In addition, management activities designed to support the program have been put in place.

Following are lists of a few accomplishments in each of the major areas. A more detailed listing of accomplishments by program is included in Section 2 and by installation in Section 3.

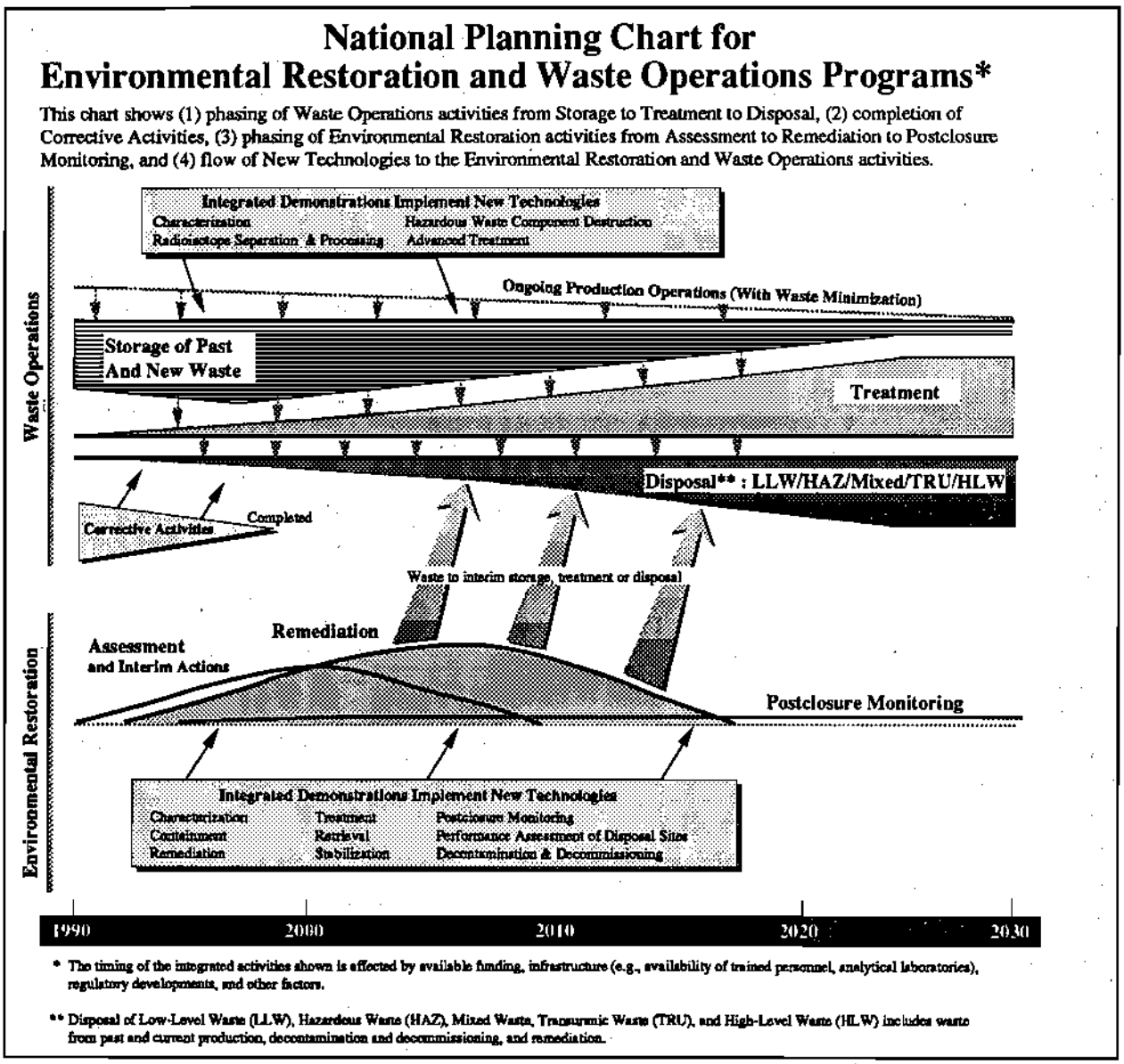


Figure 1.2.1a. National Planning Chart for Environmental Restoration and Waste Operations Programs.

Waste Operations Accomplishments:

In the Waste Operations area, EM has made great progress toward bringing DOE operations into compliance with environmental laws. In fact, EM now projects that the backlog of Corrective Activities will be eliminated by the end of FY 1997. In terms of managing waste, EM has added a number of newly permitted storage facilities and made progress on others. Progress has been made in the planning and construction of permanent treatment and disposal facilities, although some setbacks have occurred (Figure 1.2.1b).

Accomplishments in Waste Management

Near-Term

- Only two new corrective activities have been identified in FY 1991.
- Over 100 million gallons of high-level waste in 327 tanks complexwide have been safely managed.
- More than 14 million 55-gallon drums of various waste forms have been successfully treated, stored, or disposed of.
- In FY 1990, 59 compliance agreements have been put in place. It is anticipated that by the end of FY 1991, the number of compliance agreements will increase to 82 and even more by the end of FY 1992.
- The centralized waste accumulation pad at the Nevada Test Site was completed in accordance with RCRA. The pads will store solid waste.
- Aggressive action continues in solving the Hanford high-level waste tank safety issue.

Long-Term

- The Waste Isolation Pilot Plant (WIPP) will be ready to begin the test phase by receiving transuranic waste in 1991. WIPP received its no-migration variance petition from EPA in 1990.
- Construction has been completed on the Defense Waste Processing Facility at Savannah River, and equipment checkout using simulated waste is proceeding.
- Over 80 percent of the West Valley Demonstration Project high-level waste has been pretreated, and the construction of the vitrification facility is continuing.
- The Toxic Substances Control Act Incinerator at Oak Ridge has treated more than one million pounds of waste. Operations will continue.
- Construction of the Hanford Waste Vitrification Plant will begin. This facility will treat Richland's high-level waste.

Figure 1.2.1b. Waste Operations commenced new treatment operations, made significant gains in compliance issues, tested experimental processes, and initiated or completed construction of facilities during the past year. (EPA = Environmental Protection Agency)

Environmental Restoration Accomplishments:

EM currently estimates that more than 3,700 hazardous waste sites are in the Environmental Restoration area. Although progress on these sites is generally limited to assessment during 1991, some significant cleanups have been achieved. EM also includes two older cleanup programs: the Uranium Mill Tailings Remedial Action (UMTRA) Project and the Formerly Utilized Sites Remedial Action Program (FUSRAP). More than 5,000 vicinity properties are associated with UMTRA. EM has made significant progress in completing remedial activities in these more mature programs (Figure 1.2.1c).

Accomplishments in Environmental Restoration

- Fifty-seven assessments (which include actions taken under RCRA, CERCLA and D&D programs), including RCRA solid waste management units at the Oak Ridge K-25 Site and all 16 operable units at Rocky Flats, were completed in FY 1990 and 1991 as well as 33 cleanups.
- Thirty site interim remedial actions were started and 15 completed at (but not restricted to) the Rocky Flats 881 Hillside, 903 Pads Mound and East Trenches, Solar Evaporation Ponds and Surface Water Management Projects; Sandia National Laboratory-Albuquerque Chemical Waste Landfill; the Sandia National Laboratory-Livermore Waste Oil Area and Septic Tank Systems; and the Pinellas Groundwater Project.
- A RCRA Facility Investigation Plan for the Pinellas Plant miscellaneous sites has been completed and field work on these sites initiated.
- Cleanup at nine of the 24 UMTRA processing sites including four in FY 1990 (Green River, Utah; Tuba City, Arizona; Riverton, Wyoming; and Lakeview, Oregon) have been completed.
- Cleanup at 4,306 UMTRA vicinity properties has been completed or initiated through 1990.
- Four major closures at Oak Ridge and two at Savannah River were completed in FY 1990. Thirty-six RCRA closures were completed at various locations across the complex. These included the S-3 ponds at the Y-12 Plant in Oak Ridge, the M-Area Hazardous Waste Management Facility and the Mixed Waste Burial Ground at Savannah River, and the Trudell Auto Shop at Sandia National Laboratory-Livermore.
- Significant amounts of contaminated materials at Grand Junction, Colorado, at the Hanford Solar Basins, Washington, and at Rocky Flats, Colorado were removed and contained.
- The Water Boiler Reactor and Ultra-High Temperature Reactor Experiment at Los Alamos National Laboratory, three buildings at the Y-13 Site, three buildings at Batelle Columbus Laboratories, and other facilities were decommissioned and decontaminated.
- Expedited response action cleanup has begun at three Hanford sites.

Figure 1.2.1c. The Environmental Restoration Program conducted a significant number of assessments, remedial actions, and closures within the past year.

Technology Development Accomplishments:

The Technology Development Program is intertwined with the Waste Operations and Environmental Restoration Programs, supporting them through the development and implementation of new technologies and through increased availability of trained personnel. Current accomplishments reflect the fact that the Technology Development Program more than paid for itself in terms of cost savings versus budget. In the waste management area, progress has been made in identifying, testing, and adopting less hazardous process reagents to minimize the generation of future wastes. Progress has also been made in the development of methods for handling waste that is less hazardous to humans and the environment, complete degradation of hazardous materials, and stabilization of waste for permanent disposal. In the restoration area, great progress has been shown in remediation of volatile organic compounds in groundwater (Figure 1.2.1d).

Accomplishments in Technology Development

- The unqualified success of the Integrated Demonstration at Savannah River. Environmental restoration is being accomplished faster and cheaper than before. Potential savings are anticipated in millions of dollars.
- The advancement of waste minimization through the implementation of solvent substitution and the development of reusable HEPA filters. Characterization has been accelerated through real-time instrumentation developments. These accomplishments indicate that EM is moving toward faster, better, safer, and cheaper performance.
- The saving of $25 million in just 1 year by applying substitution of aqueous solvents for chlorinated hydrocarbon solvents at the Oak Ridge Y-12 Plant.
- The development of education and outreach programs through academic partnerships in New Mexico and South Carolina and with Historically Black Colleges and Universities, as well as precollege environmental education outreach programs.
- An initial assessment of human resources needed to perform the required work over the next 30+ years.
- The cosponsoring with EPA of a pilot international technology transfer system. EM successfully concluded negotiations for international agreements to share technologies and technology development costs. These agreements include a cooperative venture with the Soviet Union to exchange technical information on waste vitrification, waste separation technology, and containment transport modeling. EM also established working relationships on similar issues with other countries throughout the world.

Figure 1.2.1d. Technology Development Programs are intended to generate permanent solutions to EM issues. Integrated Demonstrations, waste minimization efforts, and human resources development initiatives were accomplishments of the past year. (HEPA = high-efficiency particulate air)

Agreements:

One measure of progress is the number of compliance agreements that DOE has entered into with Federal and State regulatory authorities. These agreements set forth the procedures and schedules under which DOE will comply with the requirements of various applicable Federal and State envionmental laws. As of June 1991, approximately 64 compliance agreements were in place with an additional 25 under negotiation (Figure 1.2.1e).

Another measure of progress is the number of States with Agreements-In-Principle (AIPs) with DOE. The Secretary's 10-point initiative of June 27, 1989, addressed the need to improve DOE's accountability in the areas of public health, safety, and environmental protection by allowing States hosting DOE facilities direct access to those facilities, and by financially underwriting the costs of State oversight of DOE environmental monitoring programs. Eleven States were originally invited to negotiate and execute formal agreements. Since 1989, 10 States have entered into AIPs. As of June 1991, agreements with three other States were under negotiation. Signed AIPs focus on State oversight of DOE programs for monitoring air, groundwater, and surface water in the vicinity of DOE facilities and DOE's compliance with applicable Federal and State environmental laws and regulations.

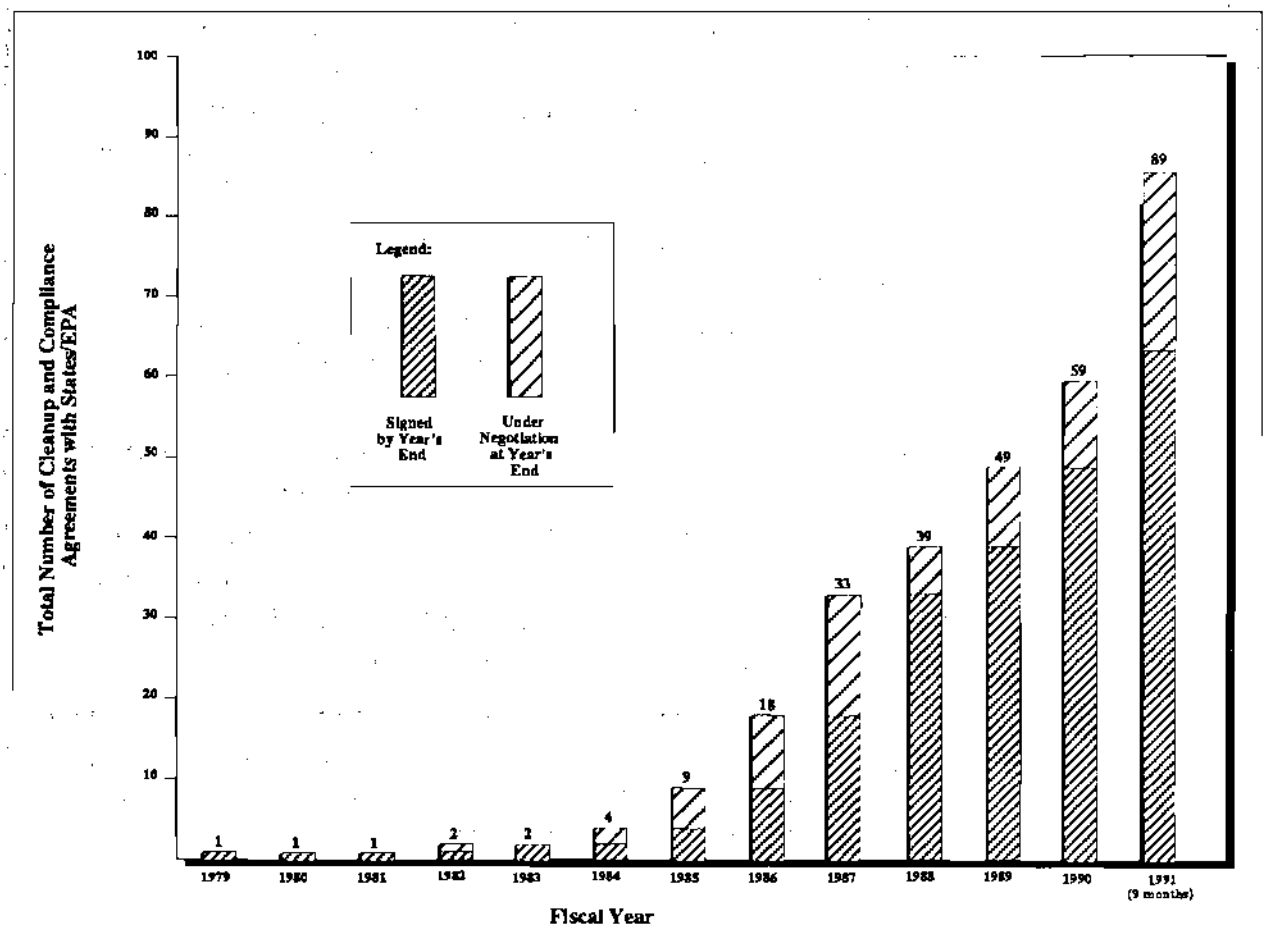


Figure 1.2.1e. The number of cleanup and compliance agreements with States/EPA has increased significantly since EM was created.

Management Highlights:

In the management area, EM has made major progress. The most notable achievement is the establishment of the Office of Environmental Restoration and Waste Management. Three line subordinate offices were created to address waste management issues (Office of Waste Operations), environmental restoration (Office of Environmental Restoration), and EM's research, development, demonstration, testing, and evaluation efforts (Office of Technology Development). Two staff offices also were created to focus on environmental compliance, safety, and cost concerns (Office of Quality Assurance and Quality Control) and budget and administrative issues (Office of Planning and Resource Management). In addition, an Assistant Manager for Environmental Restoration and Waste Management issues was established at all DOE field offices, with one exception, to ensure adequate visibility and attention is provided to EM issues. Staffing for the EM organization, both at Headquarters and in the field, has progressed. By the end of FY 1991, EM Headquarters staffing was up to 250, while staffing levels in the Field are over 900 people.

In addition to the organizational accomplishments, EM has started a number of initiatives during the past year to improve management of EM programs. These initiatives were started in an attempt to provide a sturdy platform for all activities within EM. They rely heavily on state-of-the-art theories and practices from the private sector.

Accomplishments

- Creation of the Office of Environmental Restoration and Waste Management (EM) and the staffing of up to 250 at Headquarters and over 900 in the Field.
- The continued evolution of the 5-year planning process as a planning tool for near-term goals and objectives.
- The continued development of the EM Configuration Study, coupled with the DP Reconfiguration Study, to establish the basis for the Programmatic Environmental Impact Statement (PEIS). The PEIS will form a basis for broad EM planning.
- The implementation of the roadmap methodology to provide an integrated perspective for EM decision making.
- The programwide emphasis on improving management control systems through increased compliance with DOE Orders concerning project management. In conjunction with this emphasis, a cost-estimating guidance handbook was developed to establish traceability and bases for all cost estimates throughout the Environmental Restoration Program.
- The leveraging of funds through the USAF-Boeing-DOE joint program and the DOE-EPA Memorandum of Understanding on cooperative research. This approach minimizes costs and shares resources with other agencies who are attempting to solve similar problems.
- The development of private sector participation programs to "share the costs and the wealth" of waste management, environmental restoration, and technology development with those who share EM's problems.
- The initiation of efforts to develop a tracking program to ensure effective financial management and to correlate expenditures with program progress. This will be accomplished through (1) taking a hard look at cost control measures, (2) closely tracking appropriations vs expenditures to ensure that progress is keeping pace with programmatic milestones, (3) modifying methods by which we compile and use the large data base associated with the EM program, and (4) implementing measures to track program accomplishments on a real-time basis.

Figure 1.2.1f. Management initiatives will ensure that EM can achieve its environmental goals and objectives efficiently. (DP= Defense Programs, USAF= United States Air Force)

Current Status of Milestone Commitments Provided in FY 1992-1996 Five-Year Plan: This section reports on the status of FY 1990 milestone commitments made in last year's Five-Year Plan. Of a total of 210 milestones, 122 (58 percent) have been totally completed, 50 (25 percent) have been partially completed, and 36 (17 percent) are uncompleted. Partially completed milestones pertain to situations where significant work has been completed, but the milestones still remain open. There are several contributing reasons for this situation including: safety or technical issues that require resolution prior to finalizing work, and regulatory redirection from Federal or State authorities. Missed milestones result from, for example, the finalization for Interagency Agreements that either reorder or invalidate listed milestones, or the need to resolve site-specific technical and safety issues. A description of each milestone commitment and its current status is provided in Appendix D.

As the program moves forward, EM responds to needs identified by both field managers and Federal and State regulators. Consequently, many additional activities were undertaken and completed in FY 1990 in addition to those milestones specified in the FY 1992-1996 Five-Year Plan.

1.2.2 SUMMARY STATUS OF MAJOR COMMITMENTS MADE IN THE FY 1992-1996 FIVE-YEAR PLAN

This section identifies and gives the status of the 10 most important nonmilestone commitments made in the FY 1992-1996 Five-Year Plan.

DOE uses the annual EM Five-Year Plan to establish a strategy for meeting its compliance and cleanup goals. The major commitments made in each annual plan can be used to track DOE progress toward these goals. Site-specific milestone commitments are tracked in the "Status/Accomplishments" portion of the Installation Summaries in Section 3.

The FY 1992-1996 Five-Year Plan (pages 16-17) listed 10 major nonmilestone commitments for FY 1990. These major commitments in the FY 1992-1996 Five-Year Plan can be divided into four categories: Policy, Environmental Restoration, Waste Operations/Corrective Activities, and Technology Development (Figure 1.2.2). The status of each FY 1990 nonmilestone commitment made in the FY 1992-1996 Five-Year Plan is summarized below.

Policy:

- DOE has released the health records of workers at DOE facilities; and public health risk assessments of plant sites for past, present, and future operations are planned. A Memorandum of Understanding has been drafted transferring management responsibility for the analytical epidemiological studies to the Department of Health and Human Services.
- An Applied Research and Development Program has been established through the creation of the Office of Technology Development within EM.
- Agreements-in-Principle (AIPs) were entered into with 10 States hosting DOE facilities to help fund the cost of environmental monitoring of DOE's cleanup and compliance activities. DOE is fully committed to honoring its AIPs with States and Indian Tribes and has passed on such instructions to the field.
- The concept of establishing options to accommodate unplanned funding needs has been explored. DOE continues to consider options to allow quick reaction to unforeseen demand. However, DOE's ability to guarantee funding levels is constrained by budget appropriation procedures.
- Individual and facility awards for the achievement of excellence in environmental activities have been explored but have not yet been established.
- DOE is in the final stages of developing a risk-based priority system for its cleanup activities. The Environmental Restoration prioritization system is being developed in consultation with EPA, the States in which DOE facilities are located, the State and Tribal Government Working Group, the External Review Group, and a technical review group. An interim prioritization system has been developed for EM's waste management activities.

Environmental Restoration:

- An intraagency task force was formed to address liability issues associated with environmental restoration and waste operations activities. Issues included budget planning to ensure compliance with environmental regulations and interagency agreements and permits and contractor and DOE employee liability associated with the EM activities. In November 1990, EM issued guidance for the operations and field offices on criminal and civil liability issues under environmental laws.
- DOE has evaluated options for improving the process of contracting for remedial actions. EM is currently exploring the benefits for using specialized contractors to manage environmental restoration programs. Use of such contractors would prevent Management and Operating contractors from being subject to conflict of interest and would permit the direct application of appropriate expertise.

Waste Operations/Corrective Activities:

- DOE implemented programs to minimize waste generation. EM developed a program, in collaboration with the Assistant Secretary for Defense Programs, coordinating the implementation of field site waste minimization plans as required by DOE Orders 5820.2A and 5400.1.

Technology Development:

- DOE's new EM education program funded three academic partnerships, prepared a Notice of Program Interest to add more partnerships, and developed educational outreach programs at all eight field offices.

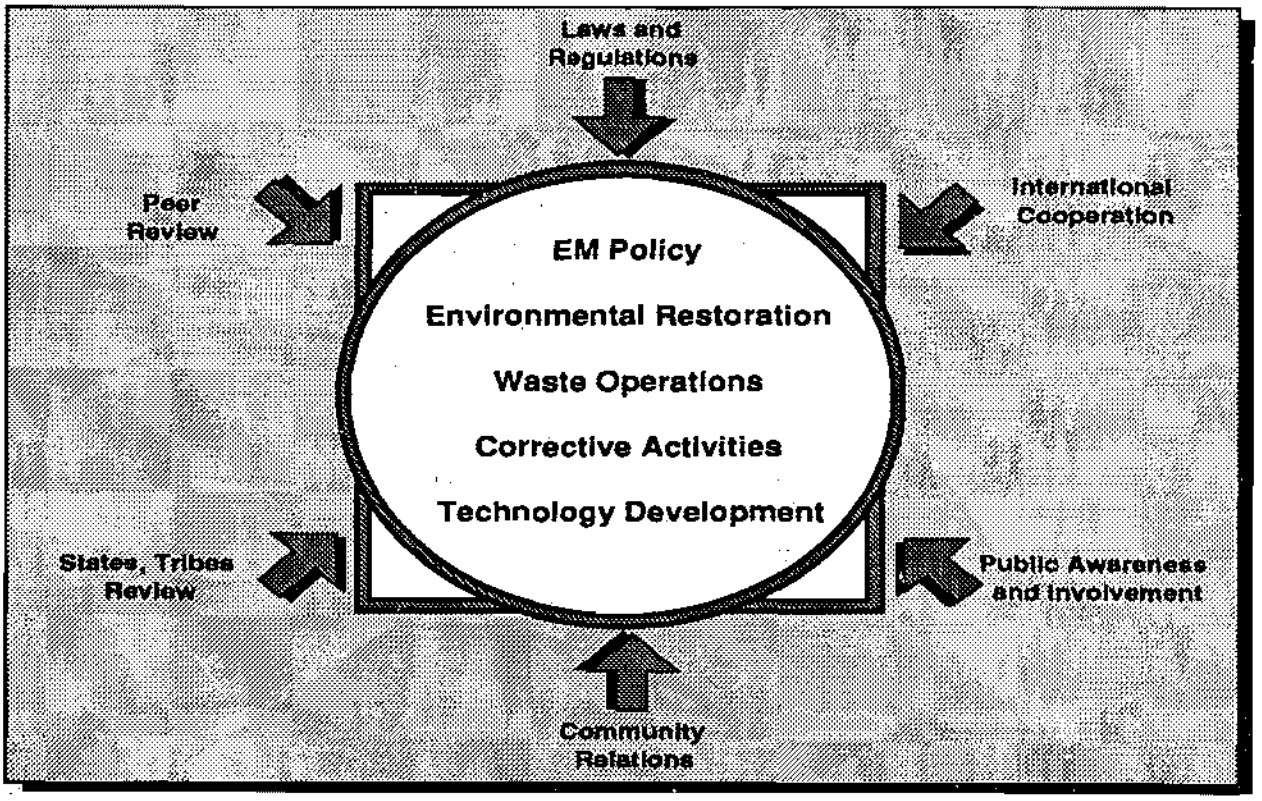
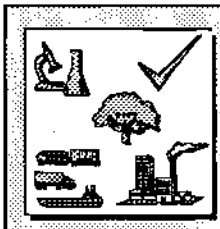


Figure 1.2.2. DOE's commitments result from a framework of laws and regulations, public awareness and involvement, and technical peer review.

1.2.3 CROSSCUTTING OBJECTIVES FOR FY 1993-1997



Several key objectives cut across the EM program. These are shared by all parts of the organization and unite EM efforts in an integrated approach to sound environmental management.

To achieve long-term goals, EM programs developed a set of near-term objectives. These near-term objectives will evolve as they are met and new challenges are encountered. EM near-term objectives, stated below, are supported by more detailed objectives in Sections 2.1.1.1, 2.2.1.1, and 2.4.4. Bias for action underlies all of EM's objectives.

- **Assess EM needs and design and develop a waste management complex that can handle waste from cradle to grave:** DOE is conducting systematic analyses of the type, size, and location of waste treatment, storage, and disposal facilities needed to support the cleanup goals and manage the waste generated by ongoing operations. A complex configuration plan (Section 2.2.1.3), the basis for development of an integrated and efficient waste management complex for DOE, is underway. Roadmaps (Section 1.4.7) are being developed as guides for EM activities throughout DOE. In addition, a risk-based prioritization system is being used to develop the Environmental Restoration budget request for FY 1993.

- **Comply with local and Federal orders and regulations and implement a method for integrating the work that needs to be done and the regulations governing it:** DOE is currently preparing a Programmatic Environmental Impact Statement (PEIS) for DOE's integrated Environmental Restoration and Waste Management activities. The PEIS is expected to be completed by the end of FY 1993, and a Record of Decision issued by the end of calendar year 1993. It will establish a framework and methodology for program implementation at DOE's facilities. Interagency Agreements (IAGs) set forth the procedures under which DOE will comply with applicable environmental requirements. As of June 1991, EM had negotiated 64 compliance agreements with EPA and State regulators. These agreements define the schedule and scope of environmental restoration activities at specific sites. The number of such agreements is expected to reach approximately 80 by the end of FY 1991.

- **Use management systems that allow centralized planning and prioritization, focusing on health and safety before production:** In order to meet program goals and objectives, EM has launched several initiatives to establish better planning, budgeting, and cost control systems for its many activities and program. These initiatives are united by the philosophy that sound short- and long-term planning should guide management and budgetary decision making, and that setting clear program priorities is essential to the success of EM's mission. These

initiatives include the development of a clearly communicated strategic plan, the use of roadmaps to aid issue-oriented planning, comprehensive 5-year program plans, and site-specific plans that provide detailed planning for each installation. There are many inputs into EM's tiered and integrated management and planning processes—both at Headquarters and the field. The most notable are Activity Data Sheets (ADSs). ADSs provide project-level information about the scope of work, regulatory drivers, funding levels, and the priority level of the activity. ADSs are categorized using a four-tiered system that gives highest priority to those activities necessary to prevent near-term adverse impacts on workers, the public, and the environment.

- **Use sound fiscal management systems that allow for responsible expenditure of dollars:** The bulk of resources being spent by EM involves thousands of persons, hundreds of contractors, billions of dollars, and thousands of individual sites and facilities. Integration of resources allocation, regulatory compliance, scheduling, budgeting, and maintenance of cost-effectiveness are primary EM goals. The issues of scope (what work EM will do), schedule (when EM will do the work), and cost (what EM will pay to do the work) are fundamental to the management control systems that ensure accountability of the DOE system. These systems are driven by DOE Orders, such as 4700.1 Project Management System and by the EM strategic and program management plans. EM has accepted and will have responsibility for several large sites containing many facilities. Management of facilities entails a wide variety of activities, including conduct of operations, maintenance programs, and safety programs. Systems approaches to managing facility inputs and outputs must be an integral part of the facility manager's repertoire.

- **Develop the EM workforce to meet the demands of a complex and growing organization.** EM requires trained Federal employees to provide the oversight and technical expertise to oversee the EM program. EM is therefore instituting aggressive training, recruiting, and other human resource initiatives to assure that its staff is the best available. An EM-directed study by Oak Ridge Associated Universities is currently underway to identify EM's specific human resource needs and potential shortages.

- **Develop and implement a systematic methodology for reducing management and operational costs associated with waste production, handling, treatment, and disposal:** Tactics to support this methodology include private sector participation, waste minimization, technology development, centralization of management, life cycle cost estimation, and systems analysis. Indicators of success can be found by exploring unit costs, cost performance indexes, implementation of new technologies, return on investment for technology development, IAGs and international agreements, and other measures.

- **Develop and implement methods for public participation in EM planning:** The opening of DOE's decision making to public scrutiny has increased. The process of public participation entails both cultural and institutional changes, which are being facilitated by public participation in the EM planning (Sections 1.4.3 and 1.4.4.1).

1.2.4 RESOURCE PLANNING ASSUMPTIONS

Sound management requires appropriate assumptions about fiscal and personnel resources and the availability of technology to get the job done.

Accomplishing EM's tasks, like any other management challenge, requires the right mix of the basic management elements: funding, people, tools, and time. Careful planning and reporting are necessary to maximize the work accomplished for the money spent. In this section of the Plan, these elements are discussed in detail.

Section 1.2.4.1 discusses funding estimates in terms of two alternative cases. The Preliminary Unvalidated Case (PUC) represents a preliminary estimate of funding: to ensure protection of the public and worker health and safety, to carry out the agreements entered into by DOE, to ensure compliance with applicable environmental requirements, and to implement other desired improvements. The second case is the Validated Target Level (VTL) which provides a 10 percent annual increase for the defense-related EM program.

Section 1.2.4.2 assesses staffing estimates, both Federal and contractor. These estimates are similarly provided for both cases as presented in the funding discussions. Final budgets and staffing allowances may be different from the funding and staffing estimates in this plan.

Section 1.2.4.3 discusses the tools—new technologies—necessary to carry out near-term activities.

Three primary factors influence the amount of work that can be accomplished within a given budget. Several assumptions about these factors influenced the development of resource needs for this year's Five-Year Plan:

- **The work force and talent pool is limited.** EM began in FY 1990 with 55 employees on loan from other DOE programs. Today, the EM program has grown to more than 250 individuals at Headquarters and 1,000 in the field. Despite this substantial growth, EM will require additional highly trained Federal employees to provide the oversight and technical expertise to oversee the EM program. The demand for more technically competent personnel is driven by the progress of the EM program, the expanding scope of EM responsibilities as more DOE functions and facilities are moved into the environmental restoration and waste management portfolio, and pressure to increase the presence of Federal employees at DOE facilities.

Demand for people to help EM accomplish its mission exceeds the supply of such individuals. EM is therefore instituting aggressive training, recruiting, and other human resource initiatives to meet these demands. DOE hires Management and Operating (M&O) contractors to accomplish many of its goals. Competing with private industry to hire the best

graduates for prospective DOE and contractor positions requires competitive salaries. Further, because of the decline of graduates from the science and engineering programs nationwide, fewer potential scientists, engineers, and technicians with the appropriate talents are available for DOE or M&O contractors to hire.

- **Facilities to treat and dispose of waste will become available.** Currently no approved facility for transuranic or high-level waste disposal exists within the DOE complex. The Waste Isolation Pilot Plant, while ready to accept transuranic waste, has not yet begun the pilot demonstration phase, let alone full operations. However, the test demonstration phase is expected to begin during FY 1991. Other facilities throughout the complex, intended to serve as interim storage or processing facilities, are caught in regulatory, political, and other issues that prevent their construction.

- **Technology does not currently exist to address all needs.** Sponsoring technology development is a risky venture with no guarantees on the return on the investment. It is impossible to predict whether solutions can be found for known problems or that applications can be immediately recognized for new discoveries. Yet aggressive attempts must be made to solve presently unsolvable problems. DOE has controls in place to provide for fiscally sound, responsible, and accountable support for technology development.

1.2.4.1 FUNDING ESTIMATES

Two funding estimates are presented.

Two Funding Estimates: As noted in the previous section, this plan presents two funding cases, the Preliminary Unvalidated Case (PUC) and the Validated Target Level (VTL). The cases were based on field submissions with EM Headquarters review (Figure 1.2.4.1a).

The VTL provides a 10 percent annual increase for the defense-related EM program. This growth rate far exceeds that of any other defense-funded program within DOE. The program grows at 10 percent per year even in the context of declining statutory caps for the overall defense category which were insisted upon by Congress.

The PUC represents a preliminary estimate of funding: to ensure protection of the public and worker health and safety, to carry out the agreements entered into by DOE, to ensure compliance with applicable environmental requirements, and to implement other desired improvements. The decisions as to what activities must be reduced or eliminated to transition from the PUC to the VTL will be directly affected by the prioritization methods described elsewhere in this Plan. Neither the PUC nor the VTL reflects the actual amount of money that will be allocated to the EM Program between FY 1993 and FY 1997. Actual funding will depend upon further priority setting in the context of the annual budget and appropriations process.

Differences Between the Cases: Figure 1.2.4.1b graphically represents the general differences between the PUC and the VTL for the program as a whole. Under the VTL, consistent with the EM prioritization philosophy, Priority 1 activities would be funded at the largest percentage of the PUC. Priority 4 activities would receive the lowest percentage of the field office requested funding. The budget shown for FY 1991 includes both the original appropriation enacted last fall and the supplemental appropriation enacted in April 1991. The FY 1992 figure reflects the FY 1992 President's request to the Congress.

In all of the funding figures, estimates for waste management, corrective activities, technology development, and program direction are provided in then-year (i.e., escalated) dollars for all years. The estimates of the Environmental Restoration Program are similarly escalated through FY 1994. Thereafter, the estimates are provided in FY 1994 dollars. With the high uncertainty associated with the scope of the post-Record of Decision efforts required in the environmental restoration program, continuing to compound the escalation in the outyears would not make sense.

Funding for this program comes from a number of sources. The great majority of the program's funding (between 80 and 90 percent) is appropriated in the Atomic

Energy Defense Activities Appropriation. This appropriation funds restoration and waste management activities associated with the weapons complex. Efforts associated with the Energy Research, Nuclear Energy, and the Uranium Mill Tailings Remedial Action Program are funded under the Energy Supply Research and Development Appropriation. Efforts specifically associated with the uranium enrichment program are funded by the Uranium Supply and Enrichment Activities Appropriation. Figures 1.2.4.1e and 1.2.4.1f provide breakouts of the funding by source.

Waste Management Program: As expected when this program was initiated, Waste Management was expected to continue to require an expanding budget through the middle of the 1990s, primarily to achieve RCRA compliance at all of its existing and required waste treatment, storage, and disposal facilities and to construct very large planned capital facilities (e.g., the Waste Isolation Pilot Plant, the Defense Waste Processing Facility, the Hanford Waste Vitrification Plant). In addition, as noted in the FY 1992-1996 update of the Plan, the Waste Management Program has also acquired (and will continue to acquire) responsibilities and facilities formerly belonging to the nuclear weapons program. Unexpected complications in several aspects of this program, such as with the high-level waste tanks at the Hanford site, have also led to increases in the estimates.

An analysis of EM's Waste Operations reveals that half of the program's efforts are dedicated to addressing the backlog of stored waste and new waste generated by EM's cleanup efforts. A significant amount of waste of all types (radioactive, hazardous, and mixed radioactive-hazardous) currently is being stored in tanks and drums around the DOE complex (see discussion Section 1.3.3). In addition, as remediation efforts in the environmental restoration and decommissioning and decontamination programs expand, additional waste will be generated. Based upon the inventories of waste used to project FY 1993 funding, costs associated with these pre-existing and cleanup-related wastes in the constrained funding case total 51% of total waste management funding. The remainder of the waste operations efforts support mission-related activities in the Defense Programs, Energy Research, and Nuclear Energy programs.

Assessment of Funding for Waste Operations by Source of Waste

Waste Source	% of FY 1993 Funding
Restoration/D&D Waste	4%
Stored Waste	47%
Defense Programs	26%
Nondefense Programs	23%

Source: Activity Data Sheets, Validated Target Level

Environmental Restoration Program: The funding profile for this program has been expected to display a steady growth for several years. The rationale for this funding profile was the acknowledgement that most of the initial program activities would be in the areas of defining the extent of contamination and detailed site characterization. The rise in funding would represent the increase in costs needed to initiate actual remediation activities. The profile of the Preliminary Unvalidated Case demonstrates this expected phenomenon as site remediation work starts. Because of the long time over which this type of activity will take place, we cannot yet expect to see the cost start to come down during the

period covered by the FY 1993-1997 Five-Year Plan.

Technology Development Program: On the scale of the total funding estimates for this program, we do not see a significant difference between the funding for the two cases. However, even though the funding for Technology Development is apparently small, it represents a vital facet of the overall program. As discussed elsewhere in this Plan, large returns are expected for these relatively small investments.

Corrective Activities Program: As discussed in both the 1990 and 1991 Plans, the funding estimates for this program will be rapidly declining over this period, and the separate identification of this program will cease. DOE facilities will be in compliance with the applicable regulatory requirements, and it will be the responsibility of the primary operating program for the facility to ensure their continued compliance.

Program Direction: This account primarily supports the Federal staffs required to carry out the entire program. This support includes personnel costs, travel, training, and the provision of direct contractual support for these staffs. An increase is needed as more Federal staff are added and to ensure that sufficient contractor expertise is available to assist the Federal staff in overseeing the execution of this major program. An aggressive oversight program, which ensures the employment of the latest technology and cost control techniques, is an absolutely essential requirement.

Preparation of the President's FY 1993 Request: It has not been decided what funding level will be supported by the Secretary in his submission to the OMB. Discussion may take place both within the Department, with OMB, and perhaps with the President. The results of all of these deliberations will be reflected in the official budget submitted early in 1992 to the Congress by the President.

It must be understood that final actions by the Congress on the President's FY 1992 budget request may also have an impact on this process. Final FY 1992 appropriation levels and congressional guidance in its authorization and appropriation bills will be given serious consideration in formulating the President's FY 1993 budget request.

Funding Needs for other DOE Program Office Responsibilities: The Office of Environmental Restoration and Waste Management is not the only DOE program that has responsibilities for waste management activities throughout the nuclear complex. As generators of hazardous, radioactive, and mixed waste, program offices such as Defense Programs (DP), Nuclear Energy (NE), and Energy Research also conduct waste management activities. These activities include waste accumulation, characterization, labelling, packaging, storage, and minimization. The program offices also conduct corrective activities to remediate situations under Notices of Violation from regulatory authorities. These activities are managed by the cognizant program office, and funding for the activities is provided by the respective program office. For FY 1993 approximately $130M is planned by other DOE program offices for waste management and corrective activities. This amount represents only those activities that were identified during the early phase of the preparation for this Five-Year Plan and may not be all-inclusive.

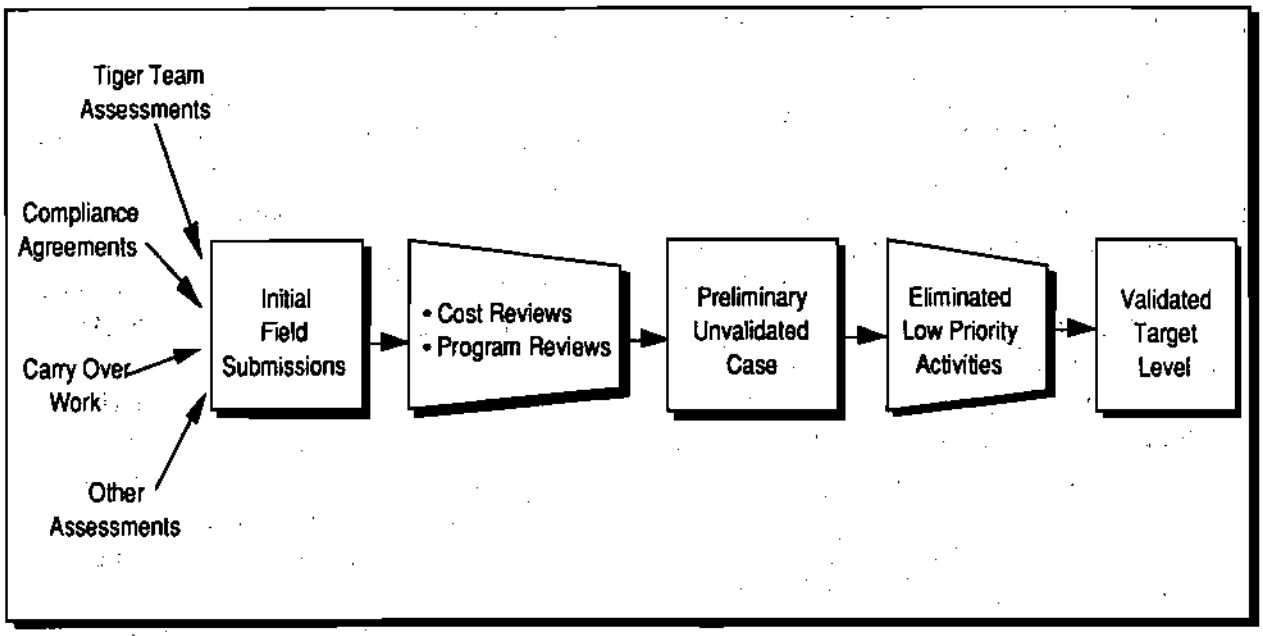
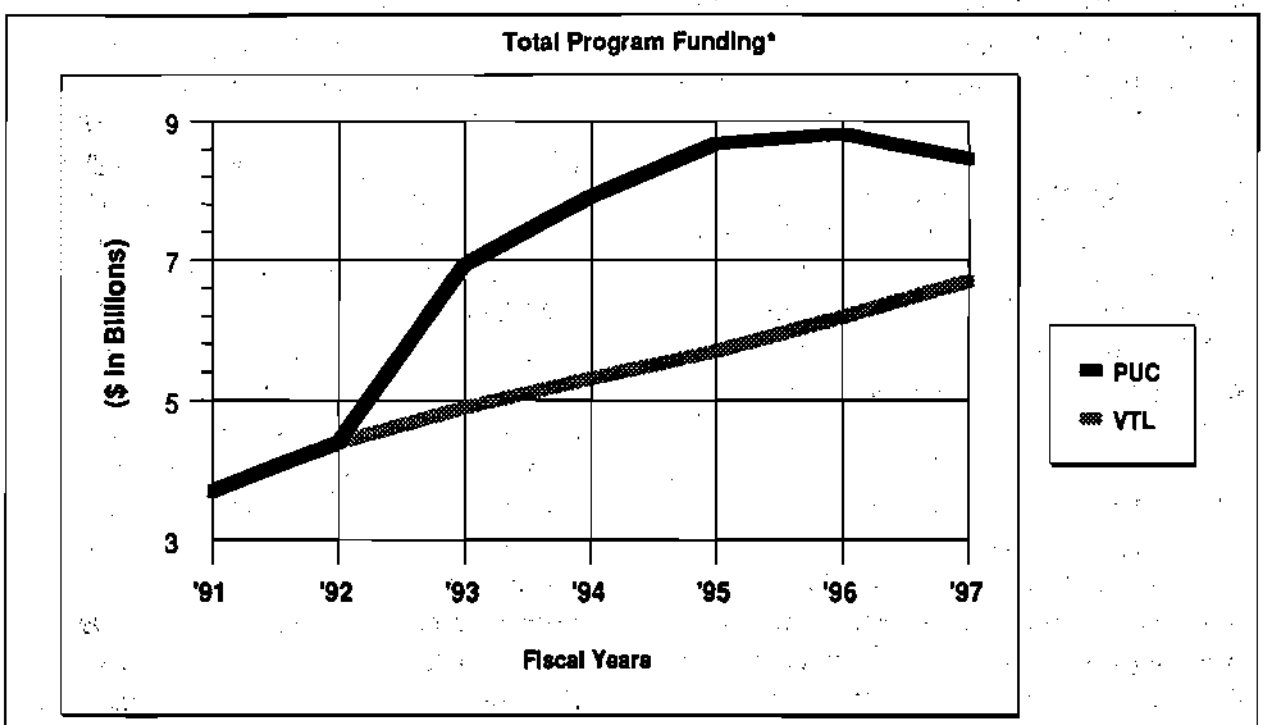


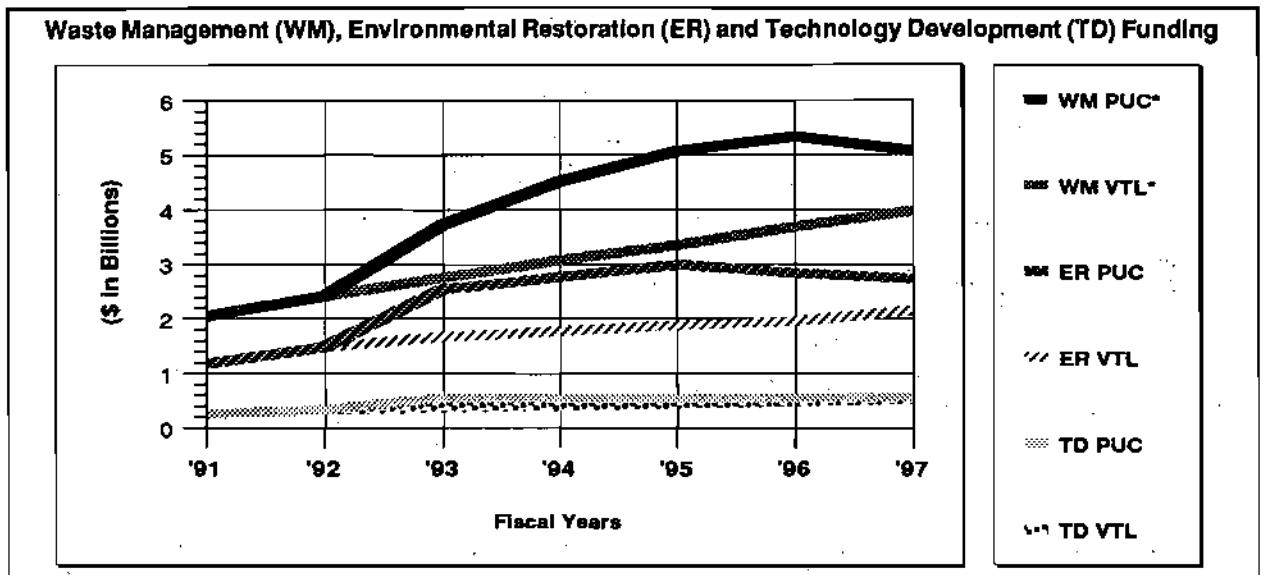
Figure 1.2.4.1a. Evolution of EM Funding Cases for FY 1993.



*Including Uranium Enrichment

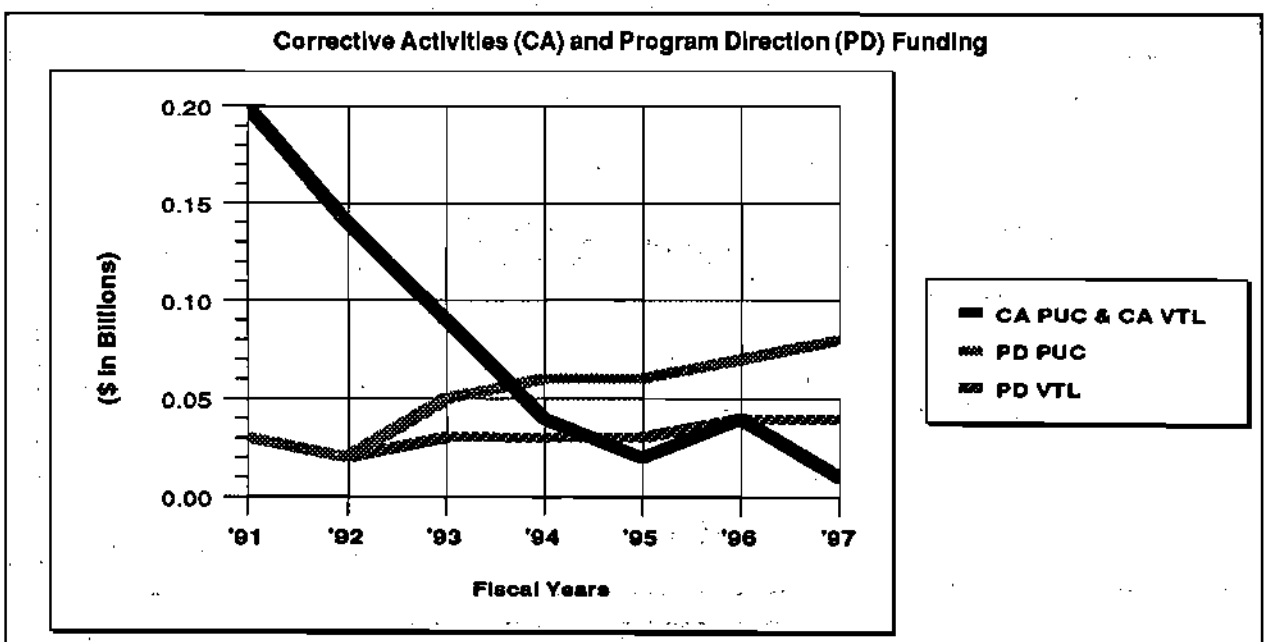
	'91	'92	'93	'94	'95	'96	'97
PUC	3.69	4.38	6.93	7.91	8.66	8.80	8.44
VTL	3.69	4.38	4.88	5.29	5.70	6.18	6.70

Figure 1.2.4.1b. Total funding is based on growing need. (PUC = Preliminary Unvalidated Case, VTL= Validated Target Level).



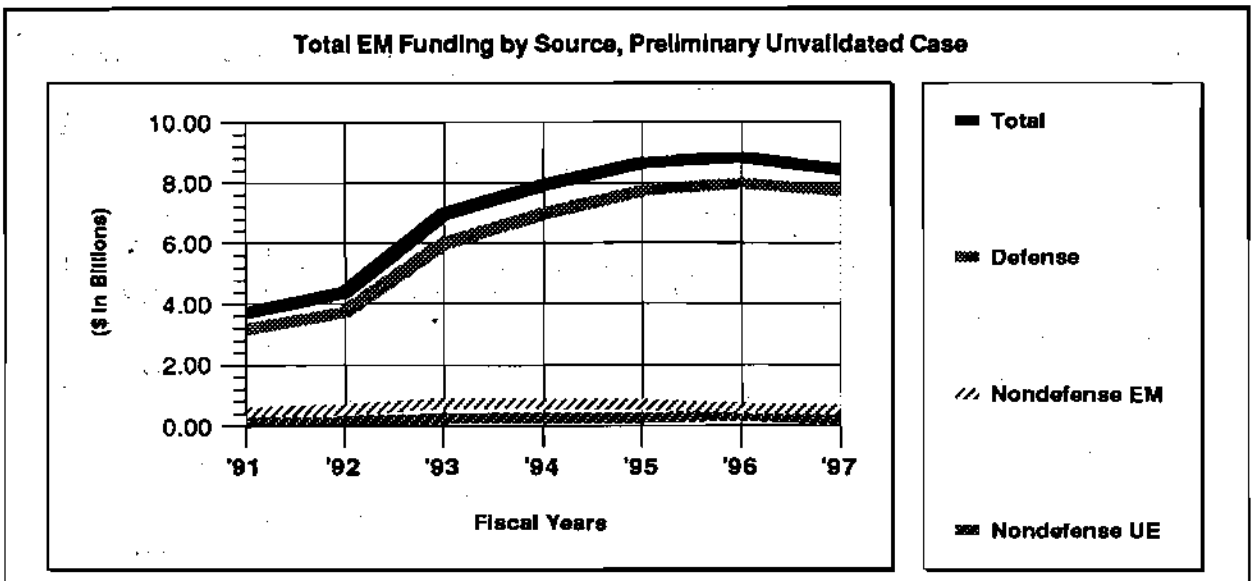
	'91	'92	'93	'94	'95	'96	'97
WM PUC*	2.03	2.41	3.72	4.50	5.05	5.32	5.06
WM VTL*	2.03	2.41	2.74	3.06	3.34	3.67	3.97
ER PUC	1.17	1.48	2.53	2.75	2.98	2.83	2.72
ER VTL	1.17	1.48	1.66	1.76	1.87	1.95	2.15
TD PUC	0.25	0.33	0.54	0.55	0.55	0.55	0.57
TD VTL	0.25	0.33	0.36	0.40	0.44	0.48	0.53

Figure 1.2.4.1c. Outyear funding in the ER Preliminary Unvalidated Case appears to buck the trend of steady growth but in reality represents the significant unknowns associated with the post-ROD period.



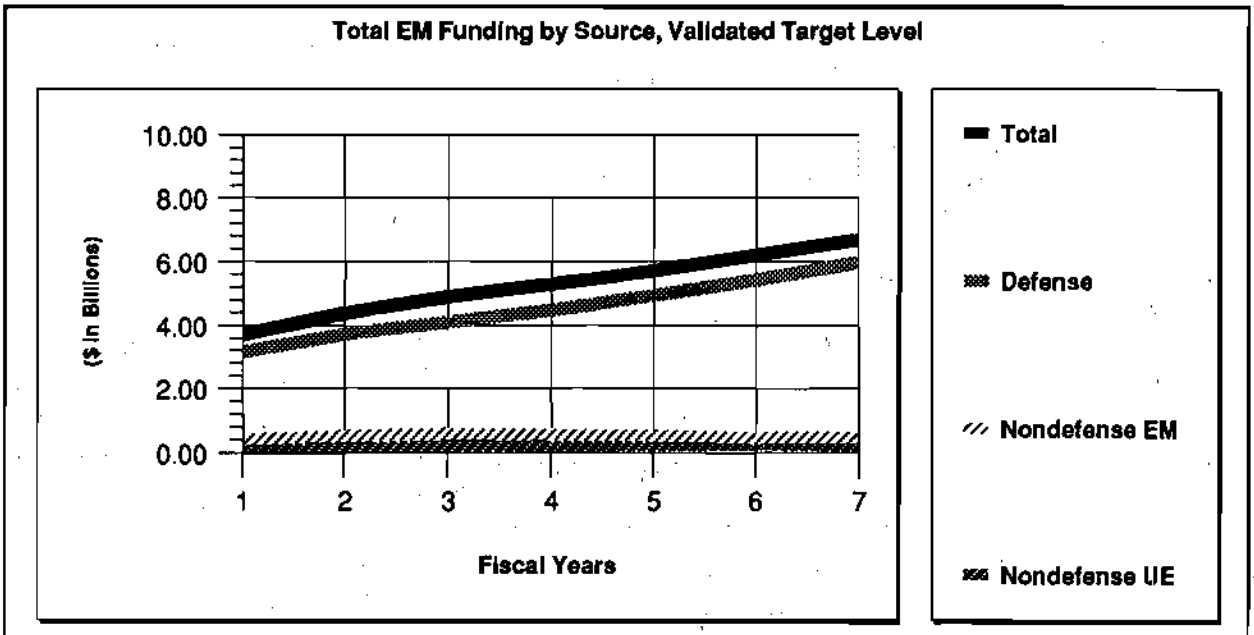
	'91	'92	'93	'94	'95	'96	'97
CA PUC	0.20	0.14	0.09	0.04	0.02	0.04	0.01
CA VTL	0.20	0.14	0.09	0.04	0.02	0.04	0.01
PD PUC	0.03	0.02	0.05	0.06	0.06	0.07	0.08
PD VTL	0.03	0.02	0.03	0.03	0.03	0.04	0.04

Figure 1.2.4.1d. Funding estimates for corrective activities reflects the projected elimination of the backlog of noncompliance situations.



	'91	'92	'93	'94	'95	'96	'97
Total	3.69	4.38	6.93	7.91	8.66	8.80	8.44
Defense	3.17	3.71	5.97	6.96	7.72	7.94	7.71
Nondefense EM	0.43	0.52	0.72	0.70	0.68	0.55	0.51
Nondefense UE	0.09	0.15	0.24	0.25	0.26	0.31	0.22

Figure 1.2.4.1e. Funding for activities included within this Five-Year Plan is derived from several sources (UE=Uranium Enrichment).



	'91	'92	'93	'94	'95	'96	'97
Total	3.69	4.38	4.88	5.29	5.70	6.18	6.70
Defense	3.17	3.71	4.08	4.48	4.93	5.42	6.00
Nondefense EM	0.43	0.52	0.59	0.58	0.54	0.48	0.50
Nondefense UE	0.09	0.15	0.21	0.23	0.23	0.28	0.20

Figure 1.2.4.1f. Funding for EM's defense-funded activities is projected to grow at a steady 10 percent per year rate over the period (UE=Uranium Enrichment).

1.2.4.2 FEDERAL AND CONTRACTOR WORK FORCE ASSUMPTIONS

Significant increases are required in the work force assigned to carry out the EM Program.

Federal vs Contractor Staffing: Since its inception in the Manhattan Project during World War II, DOE and its predecessor organizations (i.e., the Manhattan Engineering District, the Atomic Energy Commission, and the Energy Research and Development Administration) have been organized with a small cadre of Federal employees supervising a much larger work force of contractor employees. DOE's industrial complex is operated on a day-to-day basis by what are called Management & Operating (M&O) contractors. Formal contracts, generally for 5-year periods, are negotiated with qualified industrial firms.

In the past, these contracts were usually extended for additional 5-year periods. Recently, however, an increasing number of these contracts have been competed and have changed hands when the period was up. One usual condition for accepting the contract is a guarantee that the existing employees will be assured of keeping their jobs to avoid any sudden loss of corporate knowledge and experience at these critical facilities. The result has been the continuation of a very experienced work force.

The much smaller Federal work force at the site had the primary responsibility for providing direction to the operating contractor to ensure that the specific program goals, established by Headquarters, were implemented. The local Federal employees provided the primary interface with the regional, State, and local regulatory officials and had primary responsibility for ensuring protection of the health and safety of the workers and the public and the protection of the environment.

The EM Program follows this model in its dealings with the onsite contractor and the regulatory officials. The Headquarters staff develops and promulgates the broad program goals and specific guidance. This same staff prepares the formal budget documents and interfaces with the Office of Management and Budget, Congress, other Federal agencies, and the public and industrial sector, both in the United States and overseas.

EM is in the process of completing a survey to identify the full staffing needs, both contractor and Federal, required to carry out the EM mission (Section 1.3.4.1). That effort has not yet been completed. However, EM also has asked its field offices for estimates of work force requirements. The field's response as reviewed by the Headquarters program offices are included within this section.

Federal Staffing: The Federal staff assigned to this program has grown rapidly from its establishment in November of 1989. Headquarters staffing has risen from about 55 to more than 250 by the end of FY 1991. Although some of the increase has come

from the reassignment of existing DOE resources, most have come from an aggressive recruitment program from other Federal agencies and from the private sector.

Federal staffing in the field offices, specifically assigned to work on the EM program, is similarly in a period of rapid growth. In FY 1991 it will total more than 1,000 people. This growth is not only in response to the direct program activities but also to the changing DOE culture, which requires a much increased Federal presence in day-to-day operations at the sites and facilities. An increased presence is also required in the oversight of all aspects of the contractors' activities, including the derivation of work scope and cost estimates, interactions with regulatory bodies, quality assurance and quality control, and oversight of the general conduct of operations.

Contractor Staffing: Figure 1.2.4.2a presents the estimated contractor staffing levels for both funding cases discussed in Section 1.2.4.1. This figure presents the total contractor staffing levels for the entire EM Program. The contractor staffing level profile generally follows the funding profile. As more waste operations or cleanup efforts are conducted, the contractor staffing level must increase. Under both scenarios, the staffing level is expected to stabilize after FY 1993.

The individual staffing estimates for the Waste Management, Environmental Restoration, and Corrective Activities Programs are presented in Figure 1.2.4.2b. As discussed in Section 1.2.4.1, the Corrective Activities Program is expected to be completed over the planning period, so the decline in contractor staffing assigned to it is logical and expected.

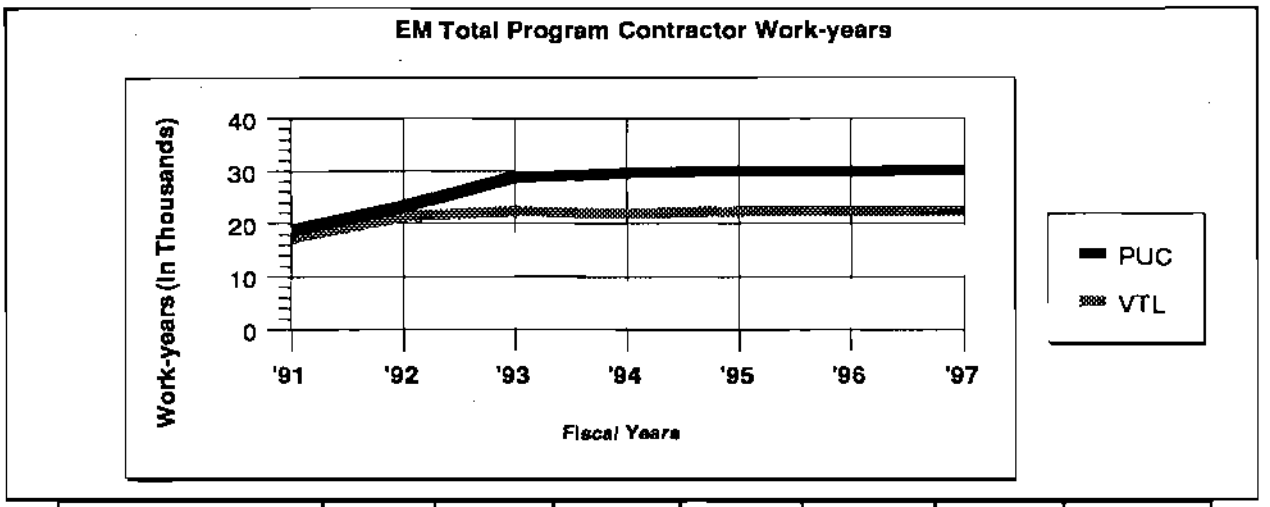
The Environmental Restoration staffing levels very closely follow the funding assumptions because the remediation activities are very labor intensive. On the other hand, the staffing figures do not appear to reflect the outyear turndown in funding in the Waste Management Program. The reason is that the funding is greatly skewed by the large amounts for major construction projects. Because the construction workers are not counted in the M&O contractor's staff, no work-year reductions follow the completion of the project. In fact, there may actually be an increase to reflect the staffing of the completed facility.

Acquisition of Qualified Personnel: As noted above, the EM Program to date has been able to enlarge its staff by the acquisition of technically competent individuals from both within the Federal government (e.g., from within the Department and from other Federal agencies like EPA and the Department of Defense) and from industry. The M&O contractors have likewise been obtaining personnel from local and State regulatory groups and industry. Because the need for these types of individuals is very great in the general economy, a concerted effort is needed to ensure that an adequate number of individuals are pursuing the necessary education to make them qualified in these disciplines. The EM contribution towards this critical effort is discussed later in this Plan.

The Department is fearful that the various competing demands for qualified individuals throughout the economy may lead to a too rapid turnover from the government to the private sector, with the highest bidder getting the resource. In such a climate, the Federal government may be at a disadvantage. Recent congressional actions in the area of Federal pay and benefits should help with this problem.

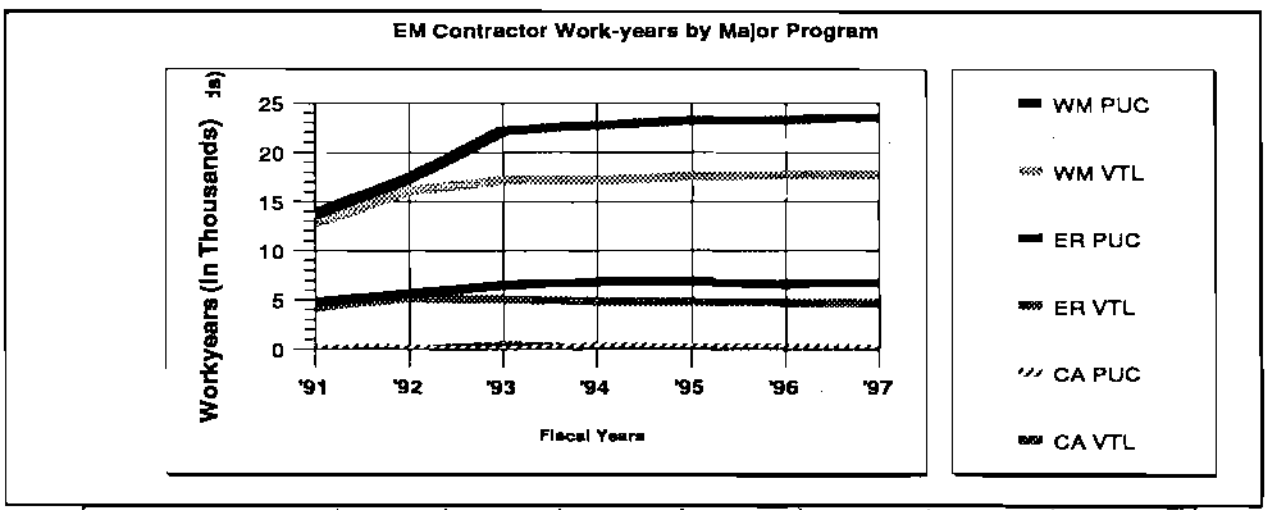
The long-term solution is to develop and train an adequate number of individuals in the

various disciplines so that there is a sufficient supply to go around. In the interim, the Nation, as a whole, is faced with the classic problem of managing a shortage in a critical area. The vast majority of those individuals who are working in this program are applying the skills they have learned in allied programs and are learning as fast as they can. Although a few "rough edges" come to light occasionally, on the whole this extremely hard-working group is making great strides in addressing the formidable tasks facing them.



	'91	'92	'93	'94	'95	'96	'97
PUC	18.758	23.313	28.766	29.661	30.187	29.942	30.351
VTL	17.385	21.408	22.346	22.074	22.351	22.394	22.49

Figure 1.2.4.2a. Work-year requirements show sharp increases as the program gears up and then stabilizes after FY 1993. (PUC = Preliminary Unvalidated Case, VTL= Validated Target Level



	'91	'92	'93	'94	'95	'96	'97
WM PUC	13.767	17.372	22.172	22.767	23.226	23.311	23.561
WM VTL	12.85	16.08	17.197	17.196	17.564	17.669	17.804
ER PUC	4.736	5.671	6.488	6.849	6.924	6.594	6.758
ER VTL	4.293	5.155	5.087	4.856	4.771	4.709	4.67
CA PUC	0.259	0.27	0.106	0.45	0.37	0.37	0.32
CA VTL	0.242	0.173	0.62	0.22	0.16	0.16	0.16

Figure 1.2.4.2b. Breakouts by program area generally reflect similar trends in overall staffing assessment: sharp growth to FY 1993 with more stability thereafter. (WM=Waste Management, ER=Environmental Restoration, CA=Corrective Activities, PUC=Preliminary Unvalidated Case, VTL= Validated Target Level).

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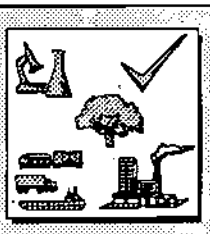
1.2.4.3 CAPABILITIES AND OTHER CRITICAL PLANNING ASSUMPTIONS



Technology capabilities, though constraining EM progress at present, will be less constraining in the future. Well planned and well executed technology development will yield faster, safer, better, and cheaper ways of accomplishing the EM mission.

Meeting the commitments for the FY 1993-1997 period requires improvement of technological tools. The overarching planning assumption is that the investment will continue during this period and that this investment in research and development will be rewarded with less costly and more efficient means for accomplishing environmental restoration and improving waste operations. This section discusses some of the successes of the technology program that are assumed to occur in this planning period.

Advancements in technologies for characterization of sites and contaminants are expected to provide the basis for confident design of remedial action measures. Methods that do not require as much drillhole boring (which is costly and diminishes the natural containment capabilities of a site) will become increasingly available. Characterization methods for process control will be made increasingly specific, more sensitive, and more rapid.

The significant progress in removing volatile organic compounds (VOCs) from groundwater and soils demonstrated in 1990 should continue. Horizontal drilling and stripping technologies are targeted for full-scale implementation at the Savannah River Site and other DOE locations where groundwater is contaminated with VOCs. Other locations with known groundwater trichloroethylene contamination include Oak Ridge, Paducah, Portsmouth, Kansas City, Livermore, Hanford, and Idaho. Further progress will be made in controlling the levels and movement of organic contaminants in groundwater through combinations of technologies such as stripping and in situ bioremediation. It is EM's hope that by investing in technology development, it will eventually be possible to address problems that now appear to be completely intractable, such as removing dense nonaqueous phase liquids from fractured media.

EM planning is predicated on the assumption that waste avoidance efforts, which were successful in 1990 in reducing the use of chlorinated hydrocarbons and consequent environmental contamination from spills, incidental losses, and disposal will continue. These efforts reduce both the amount of wastes that is produced and the degree of hazard of those wastes. As a consequence, treatment, storage, and disposal costs will be better controlled. It will also become possible for the next generation of DOE managers to begin to address the decontamination and decommissioning (D&D) of older facilities rather than focusing its entire effort on containment and control of environmental

contaminants resulting from spills and earlier waste disposal.

EM also assumes that development of new capabilities will reduce what now appear to be massive challenges in older DOE facilities. Technologies for removing contaminants or destroying them in place will require having to classify the potentially immense volumes of material generated by D&D as hazardous, radioactive, or mixed waste.

Uncertainty associated with current risk assessment methodologies will be reduced, allowing for greater confidence in forecasts and model comparisons of different remediation alternatives. Risk management will advance toward the goal of becoming a reliable tool accepted by regulatory and public sectors.

Perhaps foremost among the assumptions regarding technology development is the assumption that the strategy adopted by DOE to prepare new tools for implementation will work, even though not all the tools themselves will be perfected. Technology obviously cannot be of any value unless it is applied. Therefore, the strategic approach for managing technology development (described in Section 2.4.5) includes plans for developing and evaluating new ways of carrying out the tasks of environmental restoration and waste operations and plans for increasing the confidence of the potential user community and regulators who must permit changes in procedures and methods.

1.2.5 MILESTONES FOR MEASURING NATIONAL PROGRESS

EM has identified the most important FY 1993-1997 milestones for achieving its goals and objectives and has developed detailed activity and milestone Progress Charts for more than 30 installations.

The program to clean up and dispose of radioactive and hazardous wastes throughout DOE is a single integrated program and is presented in Figure 1.2.1, the National Planning Chart. Key aspects of the multiyear national program are to (1) assess, remediate, and monitor inactive and surplus sites and facilities; (2) store, treat, and dispose of wastes from both past and current operations and from remediation; and (3) implement needed new technology.

A National Progress Chart, (Figure 1.2.5) has been developed to present the most important planned milestones of the EM Program for FY 1993-1997. The National Progress Chart will be updated as a part of the EM Planning Process. Key Environmental Restoration (ER) FY 1993-1997 milestones reflect (1) starting and completing Remedial Investigations/ Feasibility Studies (RIs/FSs) to characterize wastes at inactive and surplus sites and facilities, (2) initiating and completing environmental cleanups [including 24 Uranium Mill Tailings Remedial Action (UMTRA) Projects], (3) completing interim actions to stabilize waste and stop additional groundwater contamination. Key Corrective Activities and Waste Management (WM) milestones include (1) completing all Corrective Activities necessary to eliminate near-term health or safety risks; (2) constructing needed radioactive waste storage and treatment facilities for high-level, transuranic (TRU), low-level, and hazardous wastes; and (3) disposing of wastes. Technology Development milestones relate to the Integrated Demonstrations (IDs) and work force support required to achieve the ER and WM milestones. Major program milestones are provided in Figure 1.2.5, with further details to be found in Section 2 of this Plan.

EM Program planning includes the analysis of activities and milestones at each of its major sites and facilities. To present this planning clearly, EM developed Progress Charts, which are visual representations of the integrated effort at each site, showing interrelationships between Corrective Activities, ER, WM, and Technology Development. They also portray long-term and 5-year objectives and FY 1989 and FY 1990 accomplishments. They are not intended to be detailed regulatory, funding, approval, or tracking tools. (More detailed tools for these purposes are under development.)

Progress Charts for more than 30 of the largest DOE EM installations are included as part of the Installation Summaries in Section 3.

Corrective Activities: Most Corrective Activities were started in FY 1990 and FY 1991 to fulfill DOE's commitment to achieving full compliance with the letter and spirit of all applicable Federal and State

environmental regulations. All Corrective Activities should be completed by FY 1997, as described in Section 2.1.1.1.

One hundred seventy-nine Corrective Activities were identified in the FY 1991-1995 Five-Year Plan, 154 in the FY 1992-1996 Five-Year Plan, and 119 currently remain, as presented in Section 2.1.1.1. Major Corrective Activities accomplishments are listed in Section 2.1.2.

Environmental Restoration: ER includes both remedial actions at nearly every DOE site and the decontamination and decommissioning (D&D) of approximately 50 facilities. Both remedial actions and D&D require assessment before cleanup. In some cases, to prevent situations from getting worse, interim actions are taken before more extensive cleanup can begin. While there is a diverse set of sites and facilities at which ER activities take place, common measures of progress are the number of assessments and cleanups that have been started and completed.

The numbers of CERCLA Remedial Investigations/Feasibility Studies (RI/FS) and RCRA Facility Investigations/Corrective Measures Studies (RFI/CMS) that have been started and completed give a rough quantitative measure of the diverse set of remedial action assessment activities underway. For D&D actions, ongoing surveillance and maintenance, feasibility characterization, and D&D planning contributes to the assessment phase, which concludes with the D&D readiness review just prior to the initiation of fieldwork. EM completed 7 remedial actions and D&D assessments in FY 1990, and plans to complete almost 250 more during FY 1991-1997.

Most sites and facilities will require some cleanup following the assessment phase. Because cleanup activities typically take months or years to complete, and the assessment phase usually has to be completed before cleanup begins, a smaller number of cleanups are scheduled for the Five-Year Plan period. In the meantime, interim measures and removal actions are undertaken where appropriate to improve the short-term situation of the facility or site. In FY 1990, EM completed 8 cleanups. From FY 1991-1997, more than 250 more cleanups, removals, and interim actions will be started, and more than 220 will be completed.

Providing accurate long-term projections for cleanup plans and schedules is a difficult task. Until the assessment phase and the Records of Decision are complete, there is uncertainty about what contaminants are present, what technologies might be used, or even whether cleanup will be required. As assessment phases advance, uncertainty will be reduced, and the numbers of planned cleanups will be better defined. The accuracy of projected timing and costs will improve as well.

Additional details on specific accomplishments and planned milestones can be found in Sections 2.3.3.2 to 2.3.3.11 for each of the field offices.

Waste Management: For high-level radioactive wastes, treatment facilities have been constructed at Savannah River and West Valley and planned and designed at Hanford and the Idaho National Engineering Laboratory. During the 5-year period ending in FY 1997, the Defense Waste Processing Facility (DWPF) at Savannah River (FY 1993) and the West Valley Demonstration Project (FY 1996) are expected to begin vitrification. (Further details are available in Section 2.2.3.1.)

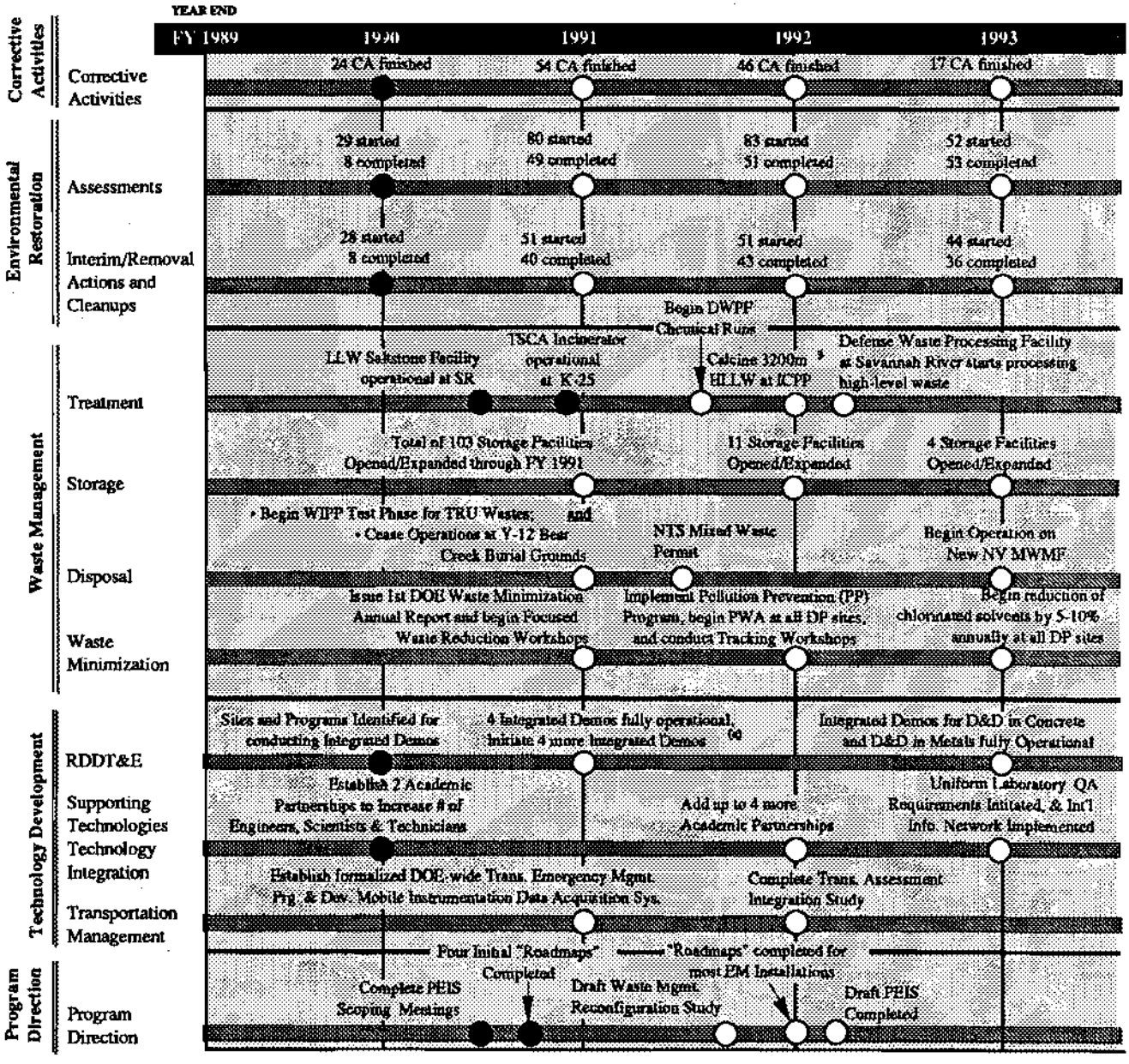
Ten sites store TRU wastes, and treatment and storage facilities are being considered at

National Progress Chart for Environmental Restoration and Waste Management Program*

* Progress (scope and schedule) shown is projected based on Validated Target Level

Five-Year (FY 1993-1997) Objectives:

- Complete Corrective Activities by FY 1997
- Complete over 150 assessments
- Complete over 130 cleanup and interim/removal actions
- Initiate high level waste treatment
- More than 100 storage facilities opened/expanded
- Determine suitability of WIPP for TRU waste disposal
- Obtain RCRA compliance for mixed waste
- Initiate cleanup at all installations
- Bring DOE sites in compliance with all applicable laws, regulations, and agreements



(a) Operational Demos are Volatile Organic Compounds (VOCs) in Saturated Soils, Buried Waste, Environmentally Conscious Manufacturing, & Depleted Uranium; Initiated Demos are Cleanup of Plutonium in Soils, Cleanup of Uranium in Soils, Cleanup of VOCs in Unsaturated Soils, & Underground Storage Tank Remediation

Figure 1.2.5. This chart illustrates some of the key EM milestones as progress is made to meet 5-year objectives.

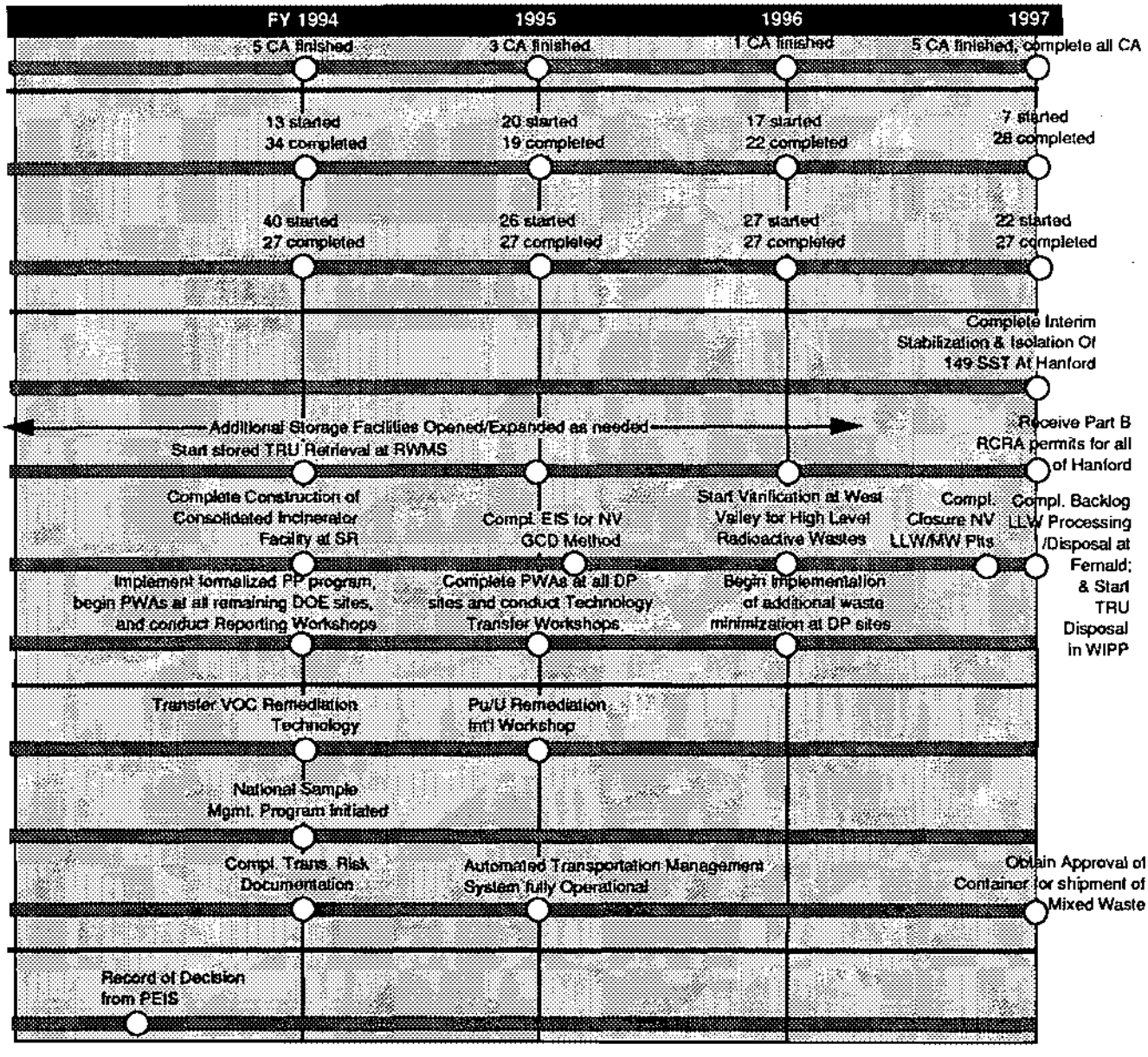
National Progress Chart (continued)

Acronyms

CA-Corrective Activities
D&D-Decontamination & Decommissioning
DP/EM MOU-Defense Programs/ EM Memorandum of Understanding
EIS-Environmental Impact Statement
FMPC-Feed Materials Production Center
GCD-Greater Containment Disposal
HLLW-High-Level Liquid Waste
ICPP-Idaho Chemical Processing Plant
LLW-Low-Level Waste
MW-Mixed Waste
MWMF-Mixed Waste Management Facility
NTS-Nevada Test Site
NV-Nevada
OU-Operable Units
PEIS-Preliminary Environmental Impact Statement
Pu/U-Plutonium/Uranium
PWA-Process Waste Assessment
QA-Quality Assurance
RCRA-Resource Conservation & Recovery Act
RDDT&E-Research Development Demonstration Testing & Evaluation
RI/FS-Remedial Investigation/Feasibility Study
RWMS-Radioactive Waste Management Site
SR-Savannah River
SST-Single Shelled Tanks
TRU-Transuranic
TSCA-Toxic Substances Control Act
UMTRA-Uranium Mill Tailings Remedial Action
WIPP-Waste Isolation Pilot Plant

Legend

Planned Milestones (milestones explanations above milestones)
Completed Milestones
Activities



Note: Because this chart does not identify all activities, see Section 3 of FY 1993-1997 Five-Year Plan for additional milestones.

Figure 1.2.5. This chart illustrates some of the key EM milestones as progress is made to meet 5-year objectives. (Continued)

Savannah River, the Idaho National Engineering Laboratory, Oak Ridge, Richland, and Rocky Flats. The Waste Isolation Pilot Plant (WIPP) has been constructed as a disposal facility for TRU wastes, and a preliminary test of TRU waste emplacement in WIPP is scheduled to begin in FY 1991.

LLW treatment will occur at a number of sites. Two incinerators are operating [the Waste Experimental Reduction Facility incinerator at the Idaho National Engineering Laboratory, and the Toxic Substances Control Act (TSCA) Incinerator in Oak Ridge which has been operational since May 1, 1991], and one more is planned at Savannah River (construction starts in FY 1994). Also, the Savannah River Saltstone Facility and the Richland Grout Treatment Facility will solidify liquid LLW and mixed LLW into stable waste forms for disposal. Six sites have operating or planned disposal facilities for LLW.

A measure of progress for storing radioactive wastes is the annual number of storage facilities that are opened or expanded after they receive a required RCRA Part B Permit. For instance, Hanford expects to receive all of its Part B RCRA Permits by FY 1997 so it can complete its necessary storage facilities.

Technology Development: In FY 1991 the fully operational IDs are (1) in the Groundwater and Soils Cleanup applications area—Volatile Organic Compounds in Saturated Soils; (2) in the Waste Retrieval and Waste Processing applications—Buried Waste; and (3) in the Waste Minimization and Waste Avoidance applications—both Environmentally Conscious Manufacturing and Depleted Uranium Waste Minimization.

In FY 1992 four additional IDs are planned to be fully operational: (1) Cleanup of Plutonium in Soils, (2) Cleanup of Uranium in Soils, and (3) Cleanup of Volatile Organic Compounds in Unsaturated Soils, and (4) Underground Storage Tank Remediation.

Also in FY 1992, up to four Academic Partnerships will be added to the existing three.

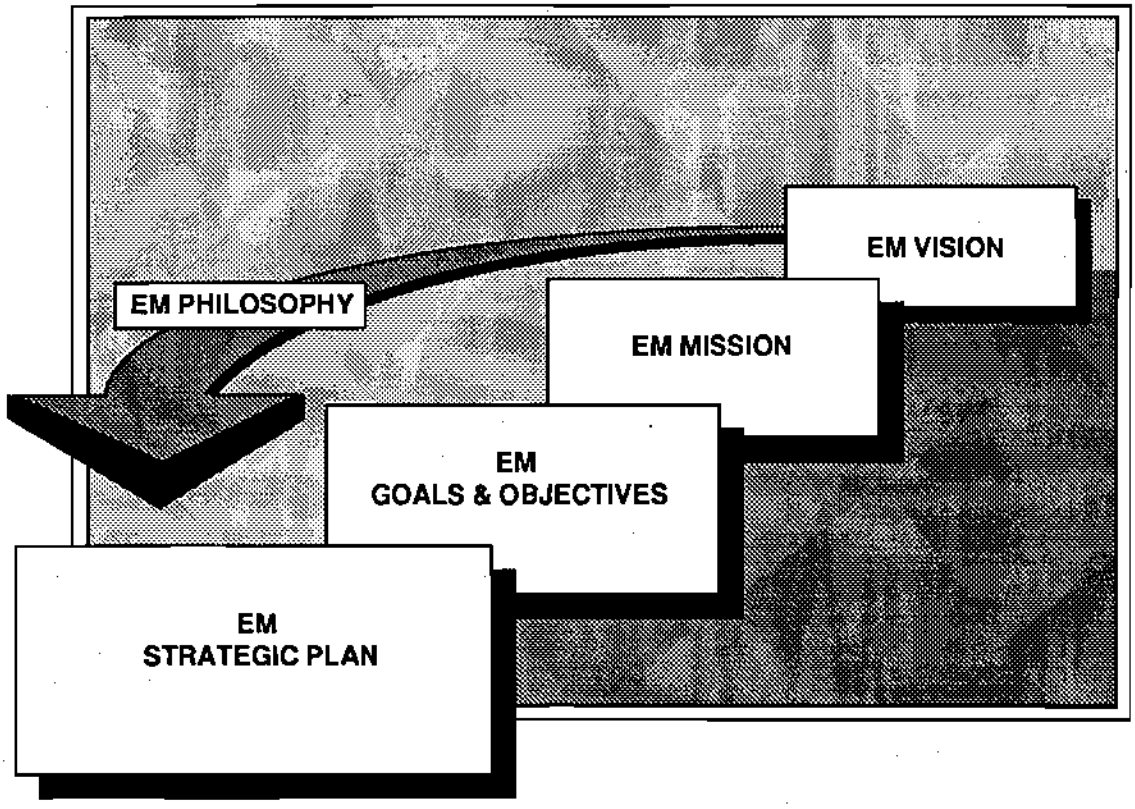
In FY 1993, it is planned that two IDs in D&D will become fully operational, one for metals and the other for concrete. Both of these are in the Waste Retrieval and Waste Treatment applications area. In the Supporting Technologies area, the Analytical Laboratory Management Program will initiate uniform laboratory QA requirements, and an international information network will be implemented.

By FY 1994, the VOC remediation technology from the first ID will be exported and in demonstration at other DOE sites.

Program Direction: Key EM program management efforts to be completed include roadmaps, which provide an important tool for strategic planning, as described in Section 1.4.7. Roadmaps will be completed for most major installations by the end of FY 1992. The Programmatic Environmental Impact Statement (PEIS) will evaluate alternatives that need to be considered in the EM Program, as described in Section 1.4.4.3. The Waste Management Configuration Study will evaluate future work production and how each waste stream can be handled.

1.3

Strategic Plan



The EM Strategic Plan is supported by the EM philosophy for accomplishing its mission. The Plan describes the long-range vision, mission, and goals and objectives of the organization and key issues and strategies.

1.3.1 STRATEGIC PLAN OVERVIEW

The EM Strategic Plan provides the principles and philosophy that guide program planning, budgeting, and execution.

The Secretary of Energy directed all Assistant Secretaries and Program Directors to develop annual strategic plans. These will lead to program plans, the identification of planning issues for Secretarial decisions, and budget formulation. While the previous Five-Year Plans have been EM's omnibus planning vehicle, the FY 1993-1997 Five-Year Plan addresses strategic planning directly. In fact, previous Five-Year Plans have placed EM in better shape to identify and address the strategic issues facing the program.

Strategic planning begins with a determination of where one wants to go and what is to be achieved. It requires careful analysis of "the current situation" to find out where one is now, what one does well, and where one can improve. This evaluation of the organization's ability, the external environment in which it operates, and its ultimate destination helps determine goals and objectives, strategies and resources required to accomplish the mission. Strategic planning also includes evaluation of potential roadblocks, and identification of steps to overcome these obstacles.

The EM Strategic Plan that follows begins with the EM vision of the future DOE facilities complex that will result from the EM program. EM cannot at this time describe in detail what each facility or site will look like in 2019, but can describe the general characteristics of the complex.

This vision of the future allows definition of the EM mission, which also supports the mission of DOE. EM then sets goals and objectives to provide the targets for program planning and budgeting. These drive the day-to-day execution of the EM program. The strategic plan also identifies issues of which resolution is critical to accomplishing these goals and objectives. Strategies for overcoming these obstacles and resolving the issues are proposed. These strategies are converted into activities in program planning.

Next, the strategic plan uses a situation analysis to look at EM's strengths, weaknesses, threats, and opportunities. The situation analysis helps EM identify what it is doing well, what can be done better, roadblocks, and major improvements that can be made.

Finally, the strategic plan presents the EM philosophy for accomplishing its mission. This philosophy translates the broad mission into more concrete terms that provide guideposts for program planning, budgeting, and execution.

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1.3.2 VISION OF WHEN WE WILL HAVE DONE IT: POSTCARDS FROM THE YEAR 2019

Not only will the DOE facilities complex of 2019 look different from today's complex, but individual sites will also vary in their availability for use—from unrestricted to restricted.

To accomplish good strategic planning, DOE needs to have a vision of the future, in addition to the successful accomplishment of the cleanup and waste management goals. This long-range vision is one of the expected outcomes of the EM Programmatic Environmental Impact Statement (PEIS) (Section 1.4.6.3). However, pending the completion of that effort, EM should be and is ensuring that the significant amount of funding being expended on the program is focused on its environmental goals and commitments. If these should change as a result of the PEIS effort, such changes will be reflected in future Five-Year Plans.

In the future, all DOE sites will be in compliance with applicable laws, regulations, and agreements related to health, safety, and the environment (Section 1.2.3), and all of its new facilities will have been designed to minimize the generation of pollutants and waste. Federal, State, and local regulators will have confirmed that DOE's sites, facilities, and operations are in compliance. This situation will not be achieved overnight but, rather, will result from 30 years of steady progress in achieving compliance for each site and facility. By this steady progress, the public will gain confidence in DOE's technical and managerial credibility. This confidence will be hard won, over many years, and DOE will work hard to maintain this valuable asset.

Unfortunately, not all cleaned-up sites and facilities will be available for unrestricted use. New technologies will make some cleanups possible and most more efficient, but even modern technology has its limits. Contamination at some sites is such that the safest and best cleanup method may be to remediate it in place. These sites, while contained and posing no environmental threat, may still have restricted public access to reduce the risk to public health. Therefore, the Federal government will retain control of these sites. Also residual material left after cleanup at other sites will not allow unrestricted public access but does allow specific uses under controlled access.

During the 1990s, DOE will begin the reconfiguration of the defense complex, largely driven by the dramatic changes in the superpower relations coupled with the fact that the complex is old and outdated. The reconfigured complex will require a smaller research and production capability and safety, environmental protection, and waste minimization will be designed and built into all processes and facilities. Through the use of new processes using nonhazardous components and inherently

producing less waste, the DOE complex will produce a small fraction of the waste that the old complex produced.

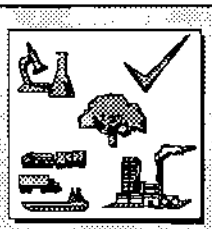
However, the decontamination and decommissioning (D&D) of the old DOE complex will produce a significant amount of waste. This waste will be treated, stored, and disposed of so that workers and the public are protected from hazards associated with the waste material (Section 1.2.3). All these waste operations will be conducted well within the requirements of applicable Federal, State, and DOE regulations. Thus the risk posed by older facilities will no longer exist, especially not from the waste resulting from the D&D. D&D will be a continuing program as old facilities will generally undergo D&D first, with newer facilities later, and currently operating facilities in the more distant future.

Transuranic waste stored at several sites will be safely disposed of in a geologic repository. The high-level radioactive waste at Savannah River, Hanford, and Idaho will have been or will be vitrified and processed for storage in the national repository. Backlogs of low-level waste will no longer exist; aged, unacceptable disposal sites will be cleaned up and restored; and old low-level waste will be disposed of in acceptable facilities. Hazardous waste will be treated and disposed of, and new hazardous waste will be treated promptly and not allowed to accumulate.

We expect that during these next 30 years of persistent effort, with successful technology development, the United States will arrive at a position of world leadership in environmental restoration and waste management technology. U. S. companies will be successfully cleaning up contaminated facilities, restoring sites and facilities to environmental compliance, and managing waste worldwide. Experience, technology, and highly qualified people will make U.S. industry everyone's first choice to tackle this most difficult job, train locals, and to do it quickly, safely, and cost-effectively.

Today, EM is taking steps designed to reach this vision. Initiatives described within this plan, such as our technology development efforts, are oriented towards aspects of this vision. Other aspects of the vision are topics of public debate. In those instances, such as the cleanup goals, initiatives described within this plan are oriented toward current legislative and regulatory objectives.

1.3.3 BASIS FOR AND DESCRIPTION OF EM MISSION



The Environmental Restoration and Waste Management mission, which will persist even if other DOE missions in research and weapons production cease, derives from DOE's goals of achieving and maintaining full compliance with applicable Federal, State, and local health, safety, and environmental laws and regulations for both current operations and previously contaminated and/or inactive facilities and sites.

DOE Mission: DOE has statutory responsibility to carry out programs in support of the nuclear weapons stockpile, energy research and development, basic research, and nuclear materials production, among others. These programs involve the operation of a wide variety of facilities, ranging from manufacturing plants to the most modern high-energy physics equipment. The nuclear weapons complex contains all the facilities necessary to research, develop, test, manufacture, assemble, and retire all the components for nuclear weapons. Energy research and development involves laboratories, test and pilot facilities, and demonstration plants for fuel production and energy generation. The basic research program uses a wide range of laboratory and experimental facilities specific to the scientific area of research. In all, more than 100 sites are located in 31 States and territories.

Waste Operations will Continue: The operation of these existing facilities and new facilities routinely generates radioactive, hazardous, and mixed waste requiring treatment, storage, and disposal (Figure 1.3.3). If these programs were to cease today, EM would still have a 30-year waste management operations program. Environmental restoration, cleanup of sites and facilities, and decontamination and decommissioning are all large generators of waste. There is also a backlog of stored waste requiring treatment and disposal; if no more waste was generated from DOE program activities, large amounts of existing waste would still require storage, treatment, and disposal. Reduction in the size of the nuclear weapons stockpile and the retirement of nuclear weapons will also generate waste in need of management. Retirement of nuclear weapons involves the disassembly and disposal (including destruction) of parts, including high explosives and nuclear materials that usually must be processed and stored. All these steps generate waste.

EM Mission: The EM mission is (1) to manage waste operations and environmental restoration activities to achieve full compliance with applicable laws, regulations, and agreements aimed at protecting human health and the environment; (2) to make compliance with the letter and spirit of environmental laws, regulations, and requirements an integral function of operating DOE facilities; and (3) to reduce the generation of new wastes. EM is organized to support these activities. EM supports DOE's production and research goals through its waste management and compliance activities and is also responsible for decontamination and decommissioning of surplus facilities. EM works to ensure that

potential risks to human health and safety and to the environment, posed by the Department's past, present, and future operations, will be either eliminated or reduced to prescribed, safe levels through cleanup of the existing inventory of inactive sites and facilities by 2019.

Specifically within EM, the Waste Operations Program manages all DOE nonproduction facilities, operations, and sites used for the storage, treatment, or disposal of radioactive, hazardous, mixed, and sanitary waste materials that have been properly characterized, packaged, and labeled. Facilities used exclusively for the long-term storage of DOE waste material are also included in this program, with the exception of those facilities under the direction of the Office of Civilian Radioactive Waste Management.

The Environmental Restoration Program mission is to assess and clean up inactive facilities and sites contaminated by waste generated from past nuclear operations and to environmentally restore all DOE facilities, operations, and sites assigned to EM.

The Department's mission has been changing in accordance with changes in the energy and defense arenas. These programmatic changes are reflected in changes in site missions. These site mission changes will result in elimination of the need for many old facilities. As a result, EM's responsibilities in the decommissioning and decontamination of these facilities will increase.

To achieve its mission and the 30-year goal, EM must develop and field new technologies rapidly and in accordance with all applicable regulations. Thus the mission of the Technology Development Program is to direct an aggressive national campaign for applied research and development to resolve major technical issues and rapidly advance beyond current technologies for EM program activities.

WASTE TYPE	CURRENT INVENTORY		ANNUAL GENERATION RATE	
	Volume	Radioactivity	Volume	Radioactivity
Low-Level	$2,557 \times 10^3 m^3$	$13,771 \times 10^3$ Ci	$\sim 76 \times 10^3 m^3$	$\sim 1119 \times 10^3$ Ci
Transuranic	$61.6 \times 10^3 m^3$	$3,666 \times 10^3$ Ci	$\sim 2.2 \times 10^3 m^3$	$\sim 106 \times 10^3$ Ci
High-Level	$381.0 \times 10^3 m^3$	$1,112 \times 10^6$ Ci	NA	NA

Figure 1.3.3. The current backlog of waste alone will provide years of waste management activities. Annual records for high-level waste reflect only changes in inventory. Because changes in inventory reflect not only the generation of new wastes but also reductions in volume due to evaporation and in radioactivity level due to radioactive decay, they are not reflected. (NA=Not Applicable)

1.3.4 GOALS, OBJECTIVES, ISSUES, AND STRATEGIES KEY TO ACCOMPLISHING THE EM MISSION

Accomplishing the EM mission depends on the integration of program goals and objectives with day-to-day work activities and, via sound strategies, the resolution of issues that could impede mission accomplishment.

The fundamental goal of the program is to ensure that risks to human health and safety and the environment posed by the Department's past, present, and future operations are either eliminated or reduced to prescribed, safe levels through cleanup of the existing inventory of inactive sites and facilities by the year 2019. This 30-year goal not only provides the guidance for long-term planning, but also guides daily operations.

Longevity of government organizations and their mission, which is critical to accomplishing the EM 30-year goal, is usually the result of legislation establishing and requiring the function. Without such establishment, there will be legitimate questioning of the likelihood of achieving the 30-year goal.

The State and Tribal Government Working Group (STGWG) and others have proposed legislation creating an emergency reserve fund, institutionalizing the Five-Year Plan and their participation in the planning process along with funding to make that participation possible. EM will continue to work with these groups on this issue.

Some of the objectives important to achieving the 30-year goal are listed below. Methods for achieving these objectives can be found in other parts of this Plan.

Objectives:

- Bring all DOE facilities and sites into compliance and operate them in compliance with applicable laws and regulations aimed at protecting public health and the environment.
- Treat, store, and dispose of the current inventory of hazardous, radioactive, and mixed waste in an environmentally sound and effective manner.
- Contain known contamination or inactive sites and vigorously assess the uncertain nature and extent of contamination at other sites to enable realistic planning, scheduling, and budgeting for cleanup.
- Continue to expand the public participation process.
- Improve DOE technical credibility.
- Develop and implement innovative, cost-effective technologies to facilitate, and in some instances make possible, compliance with applicable laws, regulations, and agreements. These technologies include developing and implementing techniques, technologies, and programs to minimize waste generation and future waste storage and disposal requirements.
- Develop a rigorous quality control and quality assurance program to ensure that public funds expended in the EM programs achieve maximum public health and environmental protection benefits.

and environmental protection benefits.

- Ensure that there are sufficient human resources (i.e., trained scientists, engineers, and technicians) to carry out the EM programs.
- Implement the technologies and procedures necessary to avoid or minimize the generation of waste of all kinds from DOE facility operations.

A number of key issues exist that impact EM planning to accomplish its mission. Several broad national issues are described below, while other specific issues are discussed in more detail following this module. The following key issues and strategies for their resolution do not define the full spectrum of EM issues; they represent the highest tier of issues that impact EM planning.

Issues:

1. Many complex and diverse Federal, State, and local laws and regulations affect the way EM does business.
2. Environmentally sound waste management is necessary both to support the environmental restoration and the decontamination and decommissioning of facilities and sites because these are large sources of waste and to support DOE production and research missions.
3. DOE must prevent potentially dangerous situations from getting worse. In addition, the extent of contamination has not been defined and identified, and there are unknowns concerning many wastes previously disposed of and others in storage.
4. Although EM is soliciting public participation in its program, the public remains skeptical of DOE's new culture and programs. They have a "show me" attitude.
5. The public, especially those individuals living in the vicinity of DOE facilities, is very concerned about the effects of DOE past, present, and future operations on their health and safety and on the environment.
6. There are regulatory hurdles to using new technologies for environmental restoration and waste management once agreements are in place.
7. The quality control and quality assurance program applies equally to financial activities and technical activities.
8. At present, the national capacity within DOE to direct, conduct, and incorporate solutions to the massive problems associated with the EM mission is limited because of a shortage of personnel, noncompetitiveness of Federal salaries, and problems associated with being a new organization. This task is too much for the limited national talent pool and resources, impeding the direction, coordination, and integration of multiple activities and the proper monitoring of contractor work.
9. DOE has entered into Federal Facilities Agreements with milestones that can only be reached by the development and implementation of new technologies.

Strategies:

1. The commitment to conduct EM activities in compliance with applicable regulations is addressed in agreements with State and Federal regulators.
2. DOE has initiated a systematic analysis of the type, size, and location of waste treatment, storage, and disposal facilities needed to support the cleanup goals, manage the waste generated by ongoing operations, complete the projects necessary to accomplish this task, and plan and execute projects to manage future waste streams.
3. The use of roadmaps is especially useful in planning and identifying impediments to progress and in integrating environmental

restoration and waste management activities. EM's first priority is to eliminate threats to public health and safety and the environment and not to allow situations to deteriorate so that threats can actually increase. Inherent in this priority are requirements to do the job right the first time, disciplined quality engineering, and a strong quality control and quality assurance program. High priority is given to characterization and assessment activities and to developing improved characterization technologies. Long-term control of some sites must be considered.

4. Public participation in Site-Specific Plans has begun earlier this year, and more involvement in the Five-Year Plan and planning process by STGWG is occurring. A Programmatic Environmental Impact Statement is being prepared, and public scoping hearings have already been held. A DOE culture that emphasizes and places a high value on openness is essential.
5. As part of its efforts to establish technical credibility, DOE must produce and report tangible results. DOE is reporting its accomplishments in this Five-Year Plan and is including progress charts showing both past accomplishments and future milestones. Future Five-Year Plans will also include these features. DOE will also improve its public credibility by doing "what is smart" as discussed in Section 1.3.6. Much of that identified previously as "smart" has been incorporated into the EM program, but more remains to be done.
6. Removing these hurdles is hindered by DOE's poor credibility. Settlements must be negotiated with EPA and States that recognize the need to reevaluate discussions as research results emerge.
7. The EM program must operate in the most cost-effective manner possible. Specifically, the estimation of program and project costs requires credibility through verification internally and externally by use of the Corps of Engineers and others to verify independent project costs.
8. DOE will encourage the study of science and engineering, aid in curricula development, and support the training of technicians and retraining production workers for environmental activities. Summer employment for science students, especially under represented groups; intern programs for undergraduates; support to education programs and curricula; and the retraining of displaced workers will help ameliorate this problem.
9. Technology needs for waste minimization are being addressed through an Integrated Demonstration. Waste minimization will be designed into a manufacturing process. Waste generated should be environmentally benign whenever possible. A variety of activities are occurring throughout the complex, such as inventory reduction, training, awareness programs, incentives, and hazardous materials tracking.

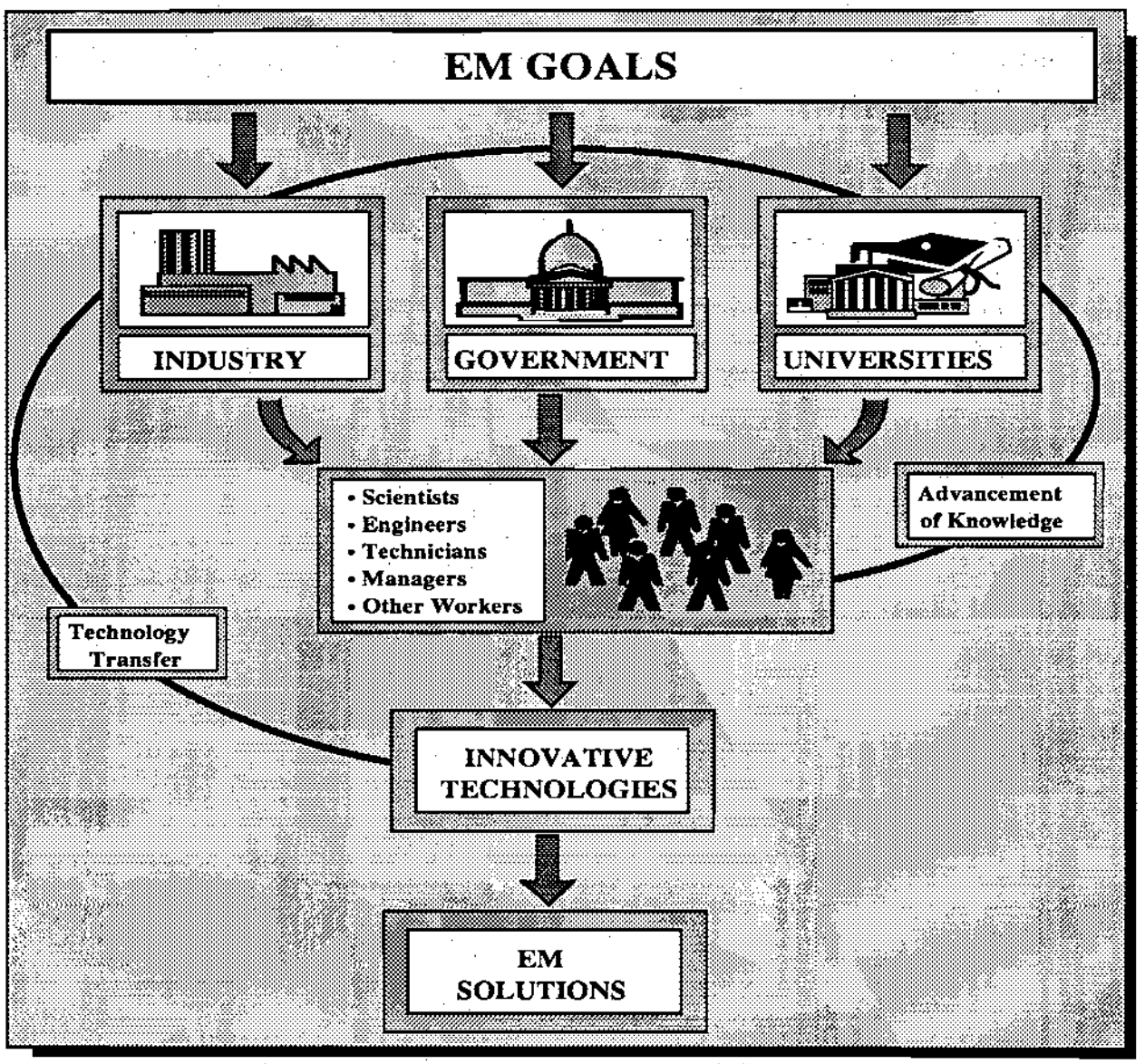
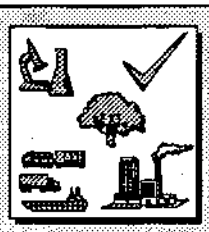


Figure 1.3.4. Achieving technological transfer and contributing to the education of all partners in DOE efforts are among the key goals of EM.

1.3.4.1 FEDERAL AND CONTRACTOR WORK FORCE CONSTRAINTS AND STRATEGIES FOR ADDRESSING THEM IN FY 1993-1997



Although a systematic process for defining and annually updating Federal and contractor work force requirements and availability will not be in place until later this fiscal year, EM, in cooperation with other parts of the Department, is initiating education and training programs, especially for the Fernald and Hanford Sites, to ensure that the current EM work force can carry out immediate and near-term mission responsibilities.

Immediate vs Long-Term Work Force Considerations: Today, EM's primary objective is to ensure that sufficient Federal and contractor employees are in place to do the EM job across the DOE complex. This objective is being achieved. At the Hanford and Fernald Sites, which are undergoing a change of mission from production to cleanup, Management and Operating contractors are currently confident about retraining the current work force without disruption of EM mission activities and undesired layoffs. Shortfalls will likely occur less among the contractor organizations and more among Federal employees as the EM field organizations attempt to gear up to fulfill the responsibilities of this major new DOE office.

What is not yet well understood are long-term human resource needs or the capacity of the educational infrastructure to support them. In addition, because no one yet knows what compliance and cleanup technologies will be used in the future, it is difficult to determine how many people and what fields of expertise will be required.

Work Force Assessment—The Foundation of Human Resource Planning: EM cannot succeed in achieving its goals and objectives without qualified staff. As a result, EM is assessing its current and projected demand for personnel, the supply of such personnel likely to result from various kinds of intervention, and ways to attract and retain needed personnel.

Work force assessments provide data to EM management for initiating Office of Technology Development (OTD) programs directed at both the current and future work force. Annual assessment data are important information for 5-year planning in terms of both prioritizing initiatives and evaluating their effectiveness. EM needs to develop estimates of its work force requirements in terms of skill mix (scientists, engineers, technicians), numbers, critical disciplines, and experience levels.

Oak Ridge Associated Universities Employment Needs Survey: The survey, conducted in 1990, represents an "in-house" study of work force demand, with a cursory look at supply. It is based on budget projections from the FY 1991-1995 Five-Year Plan and on survey data from selected DOE sites and contractors (Albuquerque, Oak Ridge, Richland, and Savannah River) collected between December 1989 and February 1990.

External reviewers reached several conclusions from the survey results. EM needs to relate its supply and demand to the national supply and demand for human resources. Further, EM should incorporate more outside input and work with the private sector. The survey also pointed out impacts of changing outyear budgets, regulations, and priorities on work force projections and emphasized training, retraining, and work force adaptability. Finally, the survey identified the need for better definition of specific skills and knowledge required for environmental engineering and other EM-related specialty disciplines.

Action Plan for a Baseline Assessment: The OTD Environmental Education and Development Branch is currently implementing a six-step action plan derived from the results of external review. The first two steps will define work force requirements (demand); the last four will define availability (supply). Results will be reported in time for inclusion in the FY 1994-1998 Five-Year Plan and will be updated annually thereafter.

Step 1. Estimate total employment and employment by installation using a model based on budget projections in the Five-Year Plan.

Step 2. Survey DOE installations for data on the skill mix and occupations required. Data on installation employment will also be gathered and correlated with the "top down" data from Step 1.

Step 3. Assess the difficulty DOE and contractors are having filling vacancies (a near-term indicator of whether a shortage actually exists).

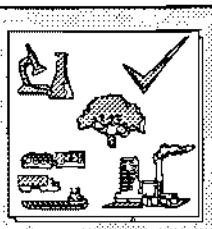
Step 4. Assess linkages between field offices and local educational institutions (secondary through graduate levels). This action will provide a near-term indicator of whether installation-specific supplies are being developed.

Step 5. Assess the skills of installation workers at risk of losing jobs because of a decline or shutdown in programs. This assessment will provide a near-term indicator of the supply of adaptable employees.

Step 6. Assess degree production nationally, taking into account the changing demographics of the national population. This assessment will provide a long-term indicator of availability.

Need for Retention Strategies and Mechanisms: It is not enough to increase the national supply of qualified personnel to meet EM-related demand. The need to attract and retain new workers and minimize attrition of current workers poses challenges that go beyond education and training. On the Federal side, current and potential employees must find that DOE is a desirable place to work, lives up to its promises to change its culture, and is becoming a more and more attractive and rewarding place to work. On the contractor side, DOE must be sensitive to issues such as crossing union lines when workers are retrained for new jobs. In this regard, the Secretary has established a Tripartite Council, consisting of representatives from unions, contractor management, and DOE.

1.3.4.2 TECHNOLOGICAL CONSTRAINTS AND STRATEGIES FOR ADDRESSING THEM IN FY 1993-1997



Technological constraints hinder both effective characterization of the subsurface environment and treatment and disposal of DOE-unique process wastes. Without new or improved technologies and a well-developed infrastructure, DOE will not be able to comply with applicable Federal, State, or local regulations.

Scope of the Problem: Existing proven technologies are not sufficient to achieve DOE cleanup and compliance goals. DOE must continually identify areas where available technologies are inadequate and develop and implement more effective and less costly means of satisfying both short-term and long-term regulatory requirements and public expectations.

Requirement for Characterization: DOE recently initiated the cleanup of large, complex sites such as Oak Ridge, Fernald, and Idaho National Engineering Laboratory. Many of the waste mixtures resulting from activities at these sites contain both hazardous and radioactive components, which are often dispersed throughout large volumes of soils and sediments, including groundwater. Existing State and Federal regulations, including RCRA and CERCLA, require contaminated sites to conduct detailed site characterizations. Current characterization techniques gain access to the subsurface via drilling boreholes, taking samples, sending samples to laboratories, and waiting for results. This process is tedious, costly, and complex and can lead to both disruption of the environment and additional spreading of contaminants.

Infrastructure—Sample Protocols and Cost: Environmental laboratories play a key role in the site characterization process. At DOE sites, many environmental problems and requisite analyses are unique, and current analytical procedures are inadequate for site characterization. For example, the analytical procedures that are generally accepted by regulatory organizations for RCRA and CERCLA sites include very few radionuclide analyses and do not adequately address problems caused by sample matrices. In addition, few analytical laboratories have the equipment and expertise to accommodate mixed waste samples. These shortages of technological resources have resulted in cost increases far above the rate of general inflation. Between 1982 and 1989, the cost associated with remediating a given amount of contaminated media increased by more than a factor of 10. If this trend of hyperinflation continues as the remediation of other large, complex sites begins (e.g., Savannah River Site, Nevada Test Site), the cost of environmental services (labor, equipment, laboratories) may be so high that it prohibits timely project completion and compliance with regulatory requirements.

Subsurface Processes: Site characterization also requires a thorough understanding of subsurface processes. Knowledge of the distribution and behavior of contaminants in the subsurface dictates the success or failure and cost-effectiveness of a given compliance strategy. A lack of data can generate a need to select very conservative or even inadequate solutions. Conversely, reliable information on key environmental issues can

lead to innovative solutions and accelerated regulatory and public acceptance.

The Office of Technology Assessment in its report *Complex Cleanup* (February 1991), noted the prospects for and limitations of various approaches to environmental restoration, including the cleanup of contaminated groundwater. The report states that, with regard to bioremediation, answers to some of the critical scientific and regulatory questions—how microorganisms degrade pollutants, what byproducts may result, and which contaminants and matrices are appropriate—have removed some of the stigma surrounding the use of biotechnology. However, much more information is needed on specific biochemical pathways, microbial kinetics, transport, and nutrient movement before bioremediation is recognized and accepted as an alternative solution to many of our environmental problems. Until then, conventional characterization and remediation methods, such as "pump-and-treat," continue to be used to clean up contaminated groundwater or treat high-explosive wastes in soil and water. This approach is not only costly but also may lead to statutory noncompliance because of prolonged periods of operation to remove contaminants from groundwater plumes.

Strategies for Cleanup: To accommodate increasingly stringent regulatory requirements in support of the Environmental Restoration; Waste Management; and Research, Development, Demonstration, Testing, and Evaluation Programs, environmental analytical methods and facilities must be developed and qualified. More sensitive and accurate techniques are required to measure contaminants at barely detectable concentrations. Site characterization and sampling methods will need to be improved and standardized. Risk management and performance assessment methods must be standardized, validated, and linked with sampling and analytical methods. Data management and information systems must be available. In short, systems need to be developed that can process and analyze samples in situ or onsite, thereby increasing safety, decreasing cost, and keeping environmental distortion at a minimum. Many systems, such as fiber optic sensors (optrodes), are available to measure a wide array of chemical constituents. However, additional research is still needed to increase the sensitivity of the optrodes, expand the range of compounds to be analyzed, and validate the results.

Section 2.4 reports the needs, programs, progress, and plans for technology development in greater detail.

1.3.4.3 INFRASTRUCTURE CONSTRAINTS AND STRATEGIES FOR ADDRESSING THEM

The Nation's infrastructure for supporting the environmental restoration and waste management activities is stretched thin. For future programs of the scale discussed in this Plan, it is inadequate.

Over the next 28 years, DOE plans to spend between $50 billion and $120 billion on environmental activities. In addition, the EPA continues to add sites to the National Priorities List, and the Department of Defense is similarly embarking on its remediation projects. When the RCRA-related activities being performed by private industry are added to this list, the increased demand for environmental services (labor, equipment, laboratories, etc.) becomes overwhelmingly clear. The environmental service sector is going to have to expand rapidly to absorb the increasing demand. If expansion in this sector does not occur rapidly, cost increases and bottlenecks or sustained hyperinflation in the environmental service sector may result.

One of the issues facing DOE's environmental management program is whether the goods and services it requires will be available at a "reasonable" cost. Over the past decade, a real increase in costs for cleanup-related goods and services has occurred. This increase is attributable to growing regulatory requirements and the $8 billion Superfund program. A sampling of government and nongovernment cleanup projects reveals a tenfold increase in the cost associated with remediating a given amount of a contaminated medium (soil or water). Several possible reasons explain the increases in real cost. These increases may be a symptom of the relatively recent emergence of the waste cleanup and control industry, or they may be the beginning of sustained hyperinflation in the industry. In addition, the increased cost also could be affected by the growing size and complexity of the sites under remediation. Only recently have government and nongovernment agencies begun the cleanup of large and complex sites.

A third explanation for the apparent growth in real cost could lie in the fact that the technologies used in the remedial and waste operations are becoming more expensive. For example, technologies associated with earlier remedial projects consisted primarily of excavation and capping, both relatively inexpensive technologies. Conventional technologies for remediation of more complex sites are more complex and costly (Figure 1.3.4.3). (See Section 1.4.6.3 for a discussion of managing cost growth in technologies for cleanup and waste management.)

Factors other than the size of the remediation could be affecting the real cost increases. The last decade has also seen shortages of test laboratories, trained personnel, and specialized equipment. These shortages of goods and services result in price increases far above the rate of general inflation.

EM is currently conducting several studies that are trying to grapple with the rising

demand in the environmental cleanup and waste management areas and the shortage of necessary services. Oak Ridge Associated Universities, for example, is focusing on environmental restoration/waste management employment needs and the potential shortage of trained technical and scientific personnel. That effort was discussed in more detail in Section 1.3.4.1 of this Five-Year Plan.

EM is also sponsoring a study to assess the potential for bottlenecks and hyperinflation in the environmental cleanup. The objectives of this study include:

- identifying the characteristics of the cleanup industry and the institutional and regulatory structure that may promote bottlenecks or hyperinflation,
- identifying characteristics specific to DOE that may be subject to particular bottleneck concerns, and
- identifying actions or policies that may decrease the likelihood of bottlenecks, thus preventing hyperinflation from occurring.

Initial findings are expected in October 1991. If potential bottlenecks and shortages can be identified, policies and procedures can be developed to mitigate the factors that contribute to rising costs.

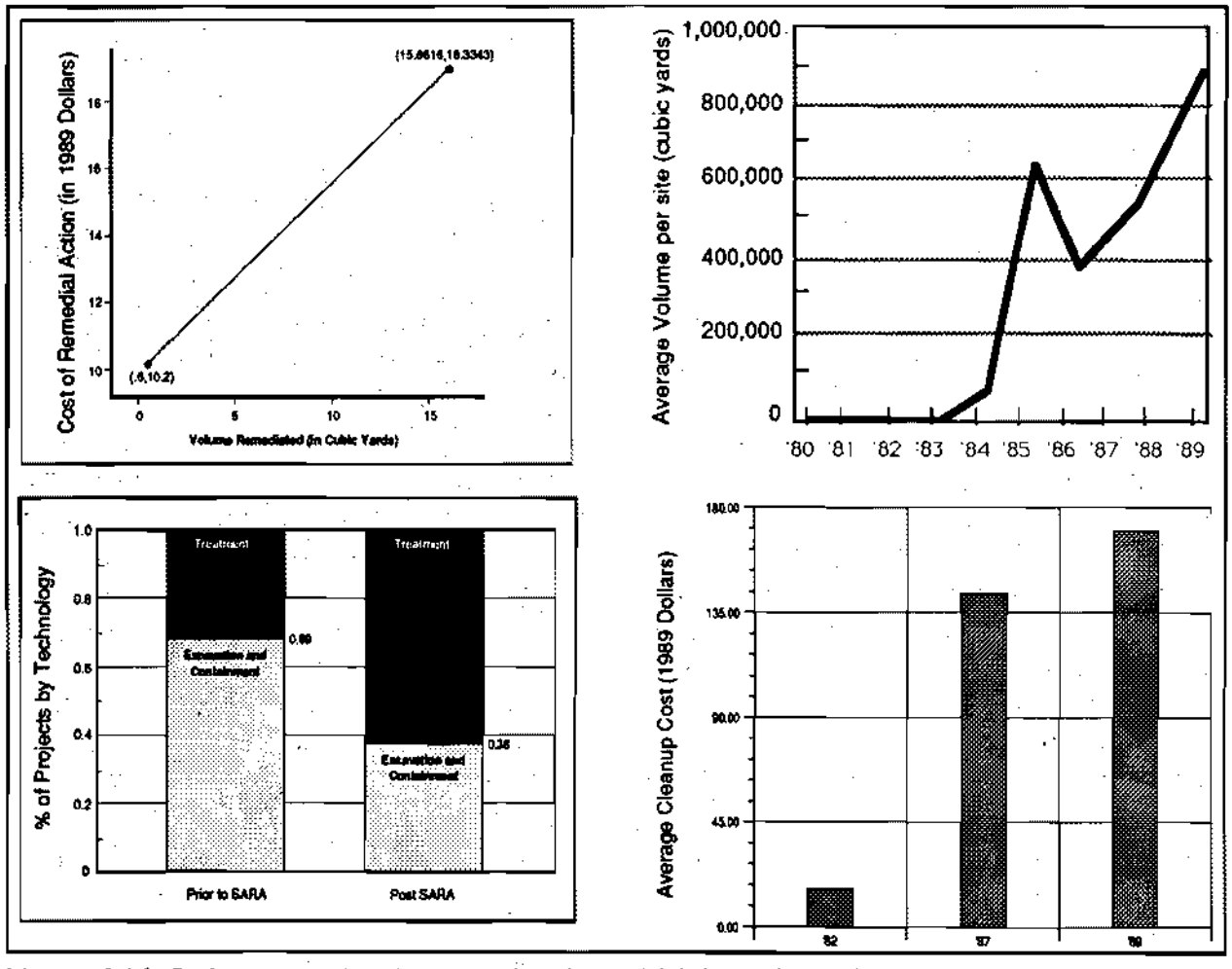
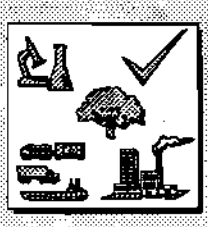


Figure 1.3.4.3. Project cost can be related to project size, which is increasing, while technology is becoming more complex and real costs are rising. (SARA = Superfund Amendments and Reauthorization Act)

1.3.5 SITUATION ANALYSIS: STRENGTHS, WEAKNESSES, REALITIES, AND OPPORTUNITIES



On balance, the EM "situation" has improved.

Every planning process, whether formal or informal, includes an evaluation of "where we are." In this step, planners evaluate their organization's current situation—the factors internal and external to the organization that affect its ability to get the job done. This analysis includes assessment of strengths (what one does best), weaknesses (what needs improvement), realities (circumstances that we do not control), and opportunities (where are circumstances right for success). EM continually sizes up the situation as it executes its programs (Figure 1.3.5).

Strengths: EM has strengthened its planning process and public participation in it. Roadmaps are currently being developed, and the early results of the first four are reported in this Five-Year Plan. The remaining sites are about to begin to develop roadmaps. The roadmap methodology enables identification of the issues that impede progress. Progress charts, summarizing the major milestones, both accomplished and yet to be accomplished, are an innovation in the planning process. The charts enable EM and others to track its progress annually and to integrate issues and their resolution strategies for all EM programs.

Public participation in EM planning has been improved. DOE field offices held public meetings on the Site-Specific Plans last summer and on preliminary information for the Five-Year Plan in February and March of 1991. EM also meets with the State and Tribal Government Working Group more frequently at important junctures in the planning process when guidance is sent out to the field and during review of draft versions of this Plan. Continued expansion of external involvement in the planning process will enable EM to achieve success in both planning and execution of its program responsibilities. This expanded participation is also an important step in building credibility.

DOE has made extensive use of Tiger Team and self-evaluation audits at most sites. These audits have identified weaknesses and strengths in safety and environmental practices and have been important tools in changing the culture.

Weaknesses: Unfortunately, some important projects continue to slip, and requirements continue to increase. While technical progress continues to be made at the Waste Isolation Pilot Plant, the start of the test phase faces delay for a variety of reasons to be discussed later in this Plan. As sites are investigated and characterized, some situations are found to be worse than anticipated, and new problems are being uncovered. This uncertainty makes the EM planning even more difficult. While EM has improved public participation in planning, communication with the public still needs improvement. EM is expanding its program

of public involvement and communication, at both the national and local levels, to reach targeted groups and individuals. EM needs an overall strategy for communication with the public.

Realities: While both the Executive Branch and Congress recognize the importance of the EM program, EM budgets are determined within the framework of the entire Federal budget. While EM cannot alter the reality of this budget process, it can ensure that funds are used efficiently and effectively. Working smart has more than technical implications; working smart means making the EM dollar go further.

Opportunities: This Plan, like previous ones, emphasizes the role and importance of the Technology Development Program in working smarter. The Integrated Demonstration program will allow the United States to become the world leader in environmental restoration and waste management technologies. Through partnerships with U.S. industries, academia, national laboratories, and other Federal, State, and local government agencies, EM will develop, demonstrate, and implement new technology. Current, ineffective technology and techniques are not the basis for becoming an international technical leader; innovative technologies are needed. Public and private sector partnership in this arena will leverage limited resources to build exceptional technology capabilities. In parallel with the cleanup program, EM is taking the opportunity to minimize the generation of waste from existing sites and from new facilities. The pollution prevention concepts of minimizing the generation of all pollutants are being incorporated.

Much has been written about the "Greening of America" and America's concern with its environment. Public safety concerns are increasing, and environmental health and safety laws are becoming more stringent and averse to risk. The recent reenactment of the Clean Air Act exemplifies this concern: provisions in the new law are significantly more restrictive than those of its predecessor. This trend will undoubtedly continue as stricter and more far-reaching environmental regulations are promulgated. EM intends to comply with all laws and regulations but acknowledges that increased cost and time in reaching the program goals will be its burden.

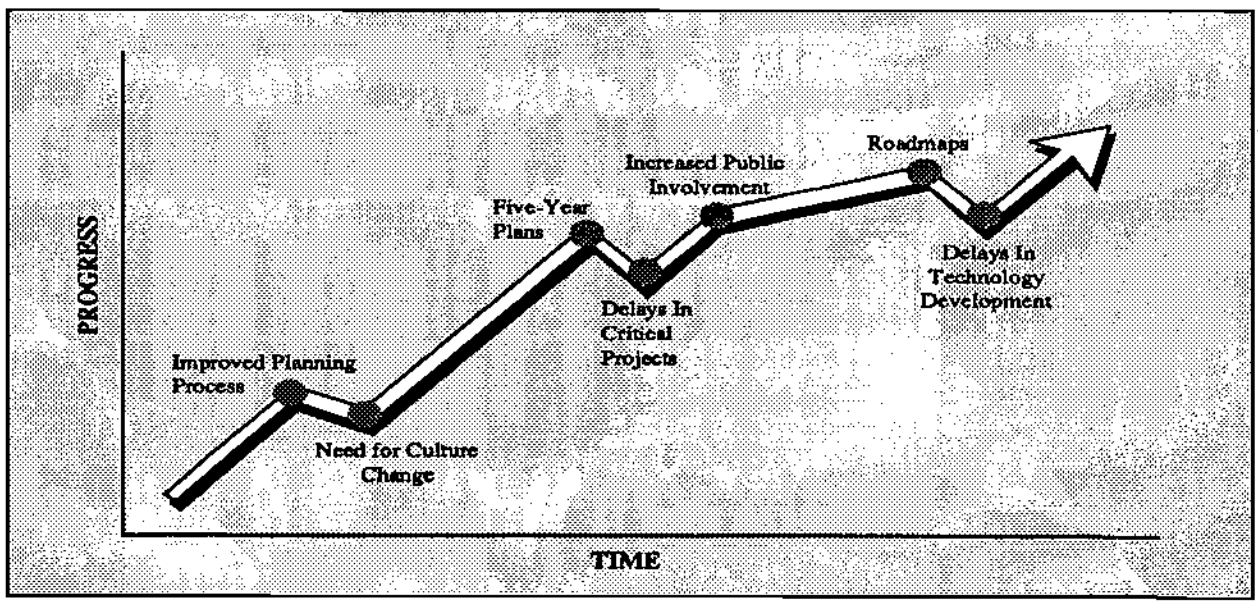


Figure 1.3.5. Many factors have an impact on EM's ability to achieve results over time.

1.3.5.1 SITUATION ANALYSIS: THE OFFICE OF TECHNOLOGY ASSESSMENT'S REPORT

The February 1991 Office of Technology Assessment (OTA) report, *Complex Cleanup*, provides valuable independent confirmation of DOE's self-assessment. The report underscores the need for EM's aggressive pursuit since 1989 of (1) sufficient information on the scope and nature of environmental problems, (2) technological and human resources to solve these problems within a realistic time frame, and (3) public credibility through participative decision making.

The February 1991 report from OTA, *Complex Cleanup - The Environmental Legacy of Nuclear Weapons Production*, was prepared at the request of the Senate Committee on Armed Services ". . . to evaluate what is known about the contamination and public health problems at the Nuclear Weapons Complex and to investigate technological and other approaches to solutions." EM recognizes that many of the conclusions and recommendations in the OTA study were an accurate assessment of problems at DOE as of a year ago but are now significantly outdated. Attempts to solve all remaining issues are ongoing.

On page 7, the OTA report identified seven obstacles to DOE's progress in cleaning up the Weapons Complex. Those obstacles, along with a summary of this Plan's references to them, are presented below:

1. "The waste and contamination problems at the DOE Weapons Complex are serious and complicated, and many public concerns about potential health and environmental impacts have not yet been addressed."

- EM is preparing a Programmatic Environmental Impact Statement (PEIS), a broad environmental analysis of the EM program, to address the environmental impacts associated with alternative approaches to the implementation of this program. The public will have opportunities to comment on the preparation of the PEIS (Section 1.4.4.3).
- An Integrated Strategic Planning Process, incorporating a roadmap methodology to identify technological needs, health and environmental issues, and management requirements, is in the early stages of development. This process includes the planning, budgeting, and execution cycle that ensures that identified needs are addressed in strategic planning (Sections 1.3, 1.4, and 1.4.7).

2. "DOE, other Federal agencies, and the States are trying to carry out their legally mandated cleanup responsibilities, but they presently lack the necessary personnel and infrastructure and have yet to develop an effective process for public involvement in setting priorities and making important decisions. Despite recent laudable efforts at changing the DOE culture, substantial credibility and public acceptance problems continue to hinder progress."

- EM has initiated actions to develop both personnel and infrastructure to address immediate and long-term responsibilities

(Sections 1.3.4.1, 1.3.4.2, 1.3.4.3, 1.3.5, and 1.3.6).

- As a part of the new, more open culture at DOE, the EM program has been opening windows of opportunity for public involvement early in its decision-making process. The increased public involvement will in turn help to build better public understanding that will ultimately improve DOE's credibility and public acceptance (Sections 1.2.5, 1.3.3, 1.4.1, 1.4.2, 1.4.3, and 1.4.3.1).

3. "The environmental program now under way at the Weapons Complex is in the very early stages, and little actual cleanup has been done. It may be impossible with current technology to remove contaminants from many groundwater plumes and deeply buried soils within reasonable bounds of time and cost. Many sites may never be returned to a condition suitable for unrestricted public access."

- EM is still largely in the assessment phase of the cleanup process. As Remedial Investigations/Feasibility Studies and Records of Decision are issued, EM will know more about the answers to the most difficult questions (Sections 1.3.1, 1.3.2, 1.3.3, 1.3.4, and 1.3.5).
- The Environmental Restoration Program is proceeding with cleanup activities throughout the Weapons Complex, as well as at other locations, including the Formerly Utilized Site Remedial Action Project and Uranium Mill Tailings Remedial Action Program sites (Sections 1.3.4 and 2.3.2).
- The Office of Technology Development (OTD) is pursuing a number of initiatives to develop better, faster, safer, and cheaper technologies for site cleanup and the treatment of resultant wastes (Sections 1.3.4.2, 1.3.6.2, and 2.4.6.1).
- Sites that will require restricted access after cleanup are being identified (Sections 1.2.5 and 1.3.4).

4. "Despite DOE statements about the lack of imminent offsite health threats due to the contamination, possible public health effects have not been investigated adequately. The current regulatory process is not sufficient to effectively identify urgent health-based remediation needs or to comprehensively evaluate possible public health impacts. Among the missing elements are a coherent strategy for evaluating potential offsite human exposure to radioactive and hazardous contaminants, a coordinated and scientifically sophisticated approach for evaluating potential health impacts from contamination, and an open process for public involvement in identifying risks and setting priorities for reducing risks."

- The PEIS mentioned above will address risks to worker and public health and the environment (Section 1.4.4.3).
- DOE is part of an interagency working group that is developing procedures for risk assessment and cleanup standards (Sections 1.2.3, 1.3.4, and 1.4.4.2).
- EM responded to comments by the State and Tribal Government Working Group to expand opportunities for predecisional input by holding early public meetings in March 1991 at the start of the FY 1993-1997 Five-Year Plan development process. These public meetings had three purposes: (1) to explain to the public and regulators how EM priority systems work and how the field offices conducted their initial evaluation and ranking of Activity Data Sheets (ADSs), (2) to allow regulators and the public to review the ADSs and determine whether these priorities were consistent with their concerns, and (3) to incorporate these comments in the development of the next Five-Year Plan. While the early

public meetings demonstrated EM's commitment to early public participation in EM planning and decision making, the success of these meetings varied (Sections 1.4.3 and 1.4.3.1).

5. "Because of the limitations of existing cleanup technologies it is prudent to invest in promising new developments; however, such efforts should not delay addressing situations in which containment and monitoring are warranted now. OTA finds that a technology development program will be most beneficial if it is focused on the most serious contamination problems identified by possible health risks."

- OTD sets priorities in technology development considering the severity of the problem addressed, timeliness, innovation, breadth of application, likelihood of success, and regulatory and social acceptability (Section 2.4.2.2).
- A "Bias for Action" philosophy and plan are in place. The thrust of the plan is to avoid excessive characterization, start cleanup as soon as possible, emphasize compliance, and eliminate or reduce potential risks to workers, to public health, and to the environment (Section 1.3.6).

6. "DOE's stated goal—to clean up all weapons sites within 30 years—is unfounded because it is not based on meaningful estimates of work to be done, the level of cleanup to be accomplished, or the availability of technologies to achieve certain cleanup levels. Neither DOE nor any other agency has been able to prepare reliable cost estimates for the total cleanup."

- In response to suggestions from the State and Tribal Government Working Group, EM established the 30-year goal to indicate its seriousness about committing the requisite energy and resources to the cleanup efforts (Section 1.1).
- While cost and schedule estimating systems will be under development for some time, EM has taken concrete steps to improve its near-term ability to develop cost estimates and activity schedules (Sections 1.2.4, 1.2.4.1, and 1.2.4.2).

7. "DOE currently has large quantities of radioactive and hazardous waste in storage at all sites, often under marginal conditions. There will be an increasing need to store waste safely onsite for fairly long periods until disposal alternatives are available. Adequate and workable standards and criteria for improved storage and treatment onsite are urgently needed."

- The EM Configuration Study is designed to develop and assess long-term strategic alternatives for configuring the DOE complex to manage these wastes (Sections 1.4.4.3 and 2.2.1.3).
- EM is considering plans to build interim storage facilities and is developing technologies to prevent the contamination of surrounding areas (Section 1.2.5).
- Efforts are ongoing to secure all required RCRA Part B permits (Sections 1.4.5.1 and 2.2.1.4).
- EM is committed to taking all necessary actions to ensure safe operations of tanks now and in the future (Section 2.2.3.1.1).

The OTA Report specifically cited the FY 1991-1995 and the FY 1992-1996 Five-Year Plans. See Appendix G for the cross-references between the OTA Report with the FY 1993-1997 Five-Year Plan.

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1.3.6 EM PHILOSOPHY FOR ACCOMPLISHING ITS MISSION

EM's philosophy is to implement the eight principles listed under the heading "What is Smart?" in the FY 1992-1996 Five-Year Plan and to add to that list as wisdom increases and reality permits.

What EM Said Was "Smart": In the FY 1992-1996 Five-Year Plan, EM developed a set of ideas to serve as principles for guiding both near- and long-term planning. A brief recapitulation of these principles and comments on the status of their implementation follows:

(1) A bias for action—avoiding excessive characterization and starting needed cleanup as soon as possible: DOE continues to emphasize that activities must, insofar as allowed by laws, regulations, and agreements, focus on eliminating or reducing known or recognized potential risks to workers, the public, and the environment. Even when it is not clear what the final remedy for a site will be or how long the remedy will take to accomplish, EM believes in taking interim measures to prevent things from getting worse. Such preventive measures include removal of contamination source terms; containment of known or suspected onsite contamination; and isolation, removal, or detoxification of offsite contamination.

DOE also continues to believe that remedial actions can generally be initiated at its sites with much less characterization than currently proposed and with little, if any, additional risk to the ultimate success of the remedy. Progress toward streamlining the characterization process is under way at the Hanford Site, through tri-party (DOE, EPA, and the State of Washington) discussions about aggregating, for purposes of parallel characterization, certain surface operable units and underlying groundwater units.

(2) Beginning now to deal with the need for added analytical laboratory capacity: The process of projecting EM needs, relative to the expected increase in the number of samples requiring analysis over the next 5 years, is being carried out by the Office of Technology Development (OTD) in consultation with other agencies that have and will have similar needs, including EPA, the Department of Defense, and the Nuclear Regulatory Commission. OTD has organized and staffed a new Laboratory Management Branch, which is currently assessing analytical capacity nationally for both hazardous and radioactive samples and for monitoring. Indications are that the greatest long-term analytical needs will be for mixed waste, and OTD is working with the Office of Waste Operations on the design of new facilities for that purpose. In addition, OTD is reviewing proposals for remote sampling systems that may permit real-time sensing of environmental contamination.

(3) Supporting the education of new scientists, engineers, managers, and workers, and retraining those whose jobs are threatened by production shutdowns and

cutbacks: EM has instituted innovative programs, including academic partnerships in New Mexico, South Carolina, and nationally under a Historically Black Colleges and Universities (HBCU)/Minority Institutions Consortium, to educate the future EM work force and to retrain and enhance the skills of the current work force, especially at sites undergoing a change of mission from production to cleanup. An emphasis of the EM Education and Development Program has been the targeting of underrepresented minorities and women, who will make up about two-thirds of the net additions to the general work force by the year 2000.

To begin tailoring its programs to meet specific anticipated near- and long-term needs in 1990, EM, through Oak Ridge Associated Universities (ORAU), conducted a preliminary top-down work force needs assessment based on budget projections from the FY 1991-1995 Five-Year Plan. An important finding was that needs for technicians were likely to be at least twice those of all other professional and skilled categories combined. EM is currently conducting a bottom-up, installation or region-specific, work force assessment. Results, due early in calendar year 1992 (and to be updated annually), will assess the adequacy of local and regional educational infrastructures to meet EM education and training needs and will provide the basis for determining needed improvements to the education pipeline. Several sites are conducting studies of their retraining needs and will develop specific programs for their salaried and hourly workers based upon the results of these studies.

(4) Verifying cost estimates internally and externally: The EM Office of Quality Assurance and Quality Control (EM-20) has prepared guidelines for EM line programs (Environmental Restoration, Waste Operations, and Technology Development) to use in developing cost estimates and conducting independent cost reviews for compliance and cleanup activities (Section 1.4.6.1). The EM line programs have primary responsibility for implementing the cost validation process, with oversight responsibilities resting in EM-20. EM-20 will independently review the EM line program implementation of the guidance by examining their process and by performing independent check estimates on a sample of the EM projects. This combined effort will help to improve the cost-estimating process and determine the realism, completeness, and consistency of cost projections.

(5) Working with the Administration and Congress to establish procedures to accommodate unexpected changes in funding requirements: The Department continues to believe that mechanisms are needed to permit flexibility to respond to unexpected changes in funding requirements without compromising accountability and financial integrity.

(6) Investing in technology development, with an immediate and vigorous emphasis on waste minimization and waste avoidance: DOE continues its strategic commitment to an aggressive technology development program (Section 2.4). Waste minimization and waste avoidance, whether by chemical substitution, process modification, or administrative control, will play a central role in planning for the waste and defense complexes of the future. EM is working with Defense Programs and other DOE offices to help achieve these benefits. Defense Programs is including waste minimization in its studies for the reconfiguration of the defense complex.

In addition to its emphasis on Integrated Demonstrations of technologies to solve

categories of problems across the complex, EM installations are assembling a series of roadmaps for major DOE nuclear facilities that will provide the basis for selecting future research and development investments to ensure timely and acceptable solutions (Section 1.4.7).

(7) Keeping an open door, an open ear, and an open mind—and asking all stakeholders to do the same: DOE continues to demonstrate its commitment to public involvement at the site level, nationally, and at all stages of its planning process. The State and Tribal Government Working Group, the Stakeholders' Forum, public meetings on preliminary inputs to the FY 1993-1997 Five-Year Plan, and the recent public hearings for the Programmatic Environmental Impact Statement at various locations throughout the country are examples of efforts to move towards two-way program communications (Sections 1.4.3 and 1.4.4.3). However, EM recognizes that its communication and public involvement activities have produced mixed results; consequently, it is working to identify new initiatives to facilitate more productive external involvement in 5-year planning activities and processes.

(8) Improving risk communications: In December 1990, the Assistant Secretary for Environment, Safety, and Health (EH) published draft guidance for field offices on conducting effective environmental restoration public participation programs to meet and exceed statutory requirements. As an aid in responding to questions involving risk, this guidance offers five recent publications, among them, "Dealing with Public Perceptions of Health Risks in a Nuclear World" (*Nuclear Plant Journal*, March-April 1989), and the EPA's "Seven Cardinal Rules of Risk Communication" (Office of Policy Analysis, 1988).

The following are new additions to the list of What Is Smart:

(9) New Environmental Restoration Contracting Strategy Initiative: EM management is carefully reviewing the principles and requirements of the Interim "Final Rule on Acquisition Regulation" (*Federal Register*, February 7, 1991; 48 CFR 915, 950 and 970) for application to future waste cleanup contracts. Specifically, EM is exploring the benefits of using specialized contractors to manage only Environmental Restoration Programs. Use of experienced, technically-trained, and skilled contractors would avoid conflict of interest complaints for Operating contractors and would facilitate the enhancement of the overall level of expertise within the ER Program.

(10) Initiative for Training in Environmental Laws and Regulations: Mandatory training in environmental laws and regulations is required for all executives, managers, and staff at the operations and field offices that have responsibility for or are indirectly involved in any activities related to the generation, management, storage, or disposal of hazardous or radioactive materials. To ensure uniformity as to the scope and content of such courses, DOE's Office of EH will be providing guidance that will standardize training materials and instructor qualifications and establish validated examinations.

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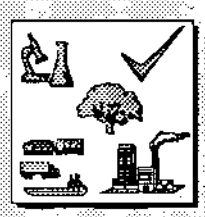
1.3.6.1 EM PHILOSOPHY: POLLUTION PREVENTION



Waste avoidance, including waste minimization, is the smartest approach to managing wastes because it reduces the cost and complexity of waste treatment and disposal and precludes the need for environmental restoration.

EM believes it is smarter to avoid waste than to manage it. Waste avoidance can be defined as the deliberate failure to produce wastes. Waste minimization, a step toward waste avoidance, is reducing radioactive, hazardous, and mixed waste as it is generated before treatment, storage, and disposal. Reduction is achieved through alteration of production methods, recycling of materials within a production stream, and substitution of less hazardous materials. Waste minimization, not merely an EPA requirement for pollution prevention, often yields a financial benefit.

Waste minimization plans for each site, required by DOE Order 5400.1, will contribute to decreases in waste treatment and storage and disposal costs and lower health risks to workers and the public. EM is working with Defense Programs and other programs within DOE to help achieve these benefits. Defense Programs is including waste minimization in its assessment for the reconfiguration of the defense complex.

Technical approaches are being sought to optimize the number of production operations required; increase the use of nonhazardous chemicals and environmentally benign waste-producing chemicals; increase the use of recyclable chemicals and materials; and implement the new design of or redesign existing products, processes, and facilities. Some criteria useful in determining successful technology include improved processing yield, reduced quantities of scrap, reduced waste and processing of byproducts, reduced use of hazardous chemicals, positive return on investment, and continued product quality.

Nuclear Waste: DOE production and research missions require handling and processing radioactive materials. The technology for nuclear materials processing defines the production and handling techniques for radioactive materials. Waste minimization is achievable through process modification such as initially forming parts in as near the final shape as possible so as to reduce cuttings from machining. Recycling of solvents may be possible in some applications. New technologies may be introduced to eliminate procedures that require hazardous materials.

Waste minimization should be introduced as early in the manufacturing process as possible and should produce environmentally benign waste. This approach reduces the material usage at the beginning of the manufacturing process. Consequently, a smaller facility is needed to perform processing and recovery, which further reduces cost.

Hazardous Chemical Waste: Thousands of gallons of hazardous solvent waste, heavy metals, toxic chemicals, and thousands of cubic feet of solid waste are generated in DOE facilities annually. Hundreds of hazardous chemicals, regulated by the Occupational Health and Safety Administration and the EPA are used throughout DOE facilities and are a potential threat to worker health. Waste minimization for these materials is mandatory because of the growing body of environmental regulations, including RCRA, CERCLA, and Toxic Substances Control Act.

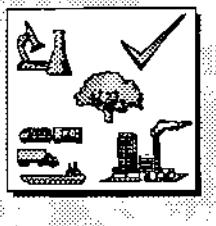
Waste Segregation: Ongoing plutonium and tritium waste minimization projects include reductions in the generation of mixed wastes as a result of improved waste segregation methods. Such approaches segregate the small radioactive portion of the waste stream from the hazardous portion. For example, tritium is collected before discharge into wastewater streams at the Savannah River Site.

Segregation of hazardous or radioactive components from nonhazardous and nonradioactive wastes is also needed. This segregation will reduce the volume of waste that must be treated as hazardous or radioactive, thereby lowering treatment and disposal costs. This segregation will also enable the hazardous or radioactive components to be more readily destroyed, recycled, or securely disposed of.

Environmental Restoration: Waste minimization also needs to be factored into the planning of environmental restoration and decontamination and decommissioning activities. Despite all waste avoidance efforts, total reportable quantities of waste generated may temporarily increase as sites achieve regulatory compliance.

In the last few years, DOE has significantly reduced the use of hazardous chemicals. However, an expanded effort toward further reductions is necessary. With the easier problems already solved, such as reductions in use of chlorinated solvents and improved waste segregation, new technology is needed for nonhazardous materials substitutions, recycling, and nonpolluting processes. Waste minimization activities are discussed in Section 2.2.3.7 and waste minimization technology development is discussed in Section 2.4.6.1.3.

1.3.6.2 EM PHILOSOPHY: MAKING PROGRESS IN TECHNOLOGY DEVELOPMENT



In its first full year of operation, the Office of Technology Development (OTD) has (1) formulated a program structure, referred to as Integrated Demonstrations (IDs), to expedite the implementation of new technology, (2) cultivated and expanded the educational programs begun in 1990, and (3) accomplished significant advances in technologies for environmental restoration and waste operations and for waste minimization.

EM believes that new technologies will make accomplishment of its mission faster, safer, better, and cheaper. Therefore, the OTD was created in November 1989. In its first 18 months of operation, OTD has fashioned a comprehensive needs-driven program based on a combination of previously ongoing and newly started activities.

Conception and planning of a program management structure that not only addresses user-defined needs but also encompasses the full range of activities required for implementation of a technology may be the most significant development in OTD. The Integrated Program/Integrated Demonstration (ID) configuration described in Section 2.4 is designed to achieve these goals.

Progress has been made through increasing attention to technical needs in program organization. The high-order needs were recognized at the outset to expedite the implementation of new technologies in accomplishing tasks that either could not be performed at present or that are expensive and technologically awkward and to promote the education of a work force capable of applying these new technologies. It was also apparent that greater attention to user-defined technology needs was necessary to properly shape the program. Therefore, the process of roadmap planning (Section 1.4.7) has been developed and promoted by OTD. In addition to roadmap planning, specific needs assessments are under way in the Offices of Environmental Restoration and Waste Operations with OTD collaboration.

Technical progress has also been made in the first IDs and other activities. The ID for Remediation of Volatile Organic Compounds in Groundwater and Saturated Soils (Figure 1.3.6.2) has consolidated the demonstration of 12 separate technologies in characterization and remediation and has shown immense potential cost savings (Section 1.4.6.3). Technology advances in processing depleted uranium at the Oak Ridge Y-12 Plant and in uses of chlorinated hydrocarbon solvents and cleaning agents have already achieved substantial waste avoidance.

Also in the waste minimization area, programmatic leveraging through a Memorandum of Agreement involving the U.S. Air Force and Boeing Corporation to focus on chlorinated solvent elimination has enabled a $2 million investment to benefit from a $12 million overall program. A nationally coordinated robotics development program has been established to draw on the strengths of various DOE laboratories and industry and to reduce duplication of effort.

The OTD education program originally initiated two DOE-University Partnerships, which have pursued 27 collaborative research tasks related to Environmental Restoration and Waste Operations technologies during the past year. A new partnership with a set of Historically Black Colleges and Universities/ Minority Institutions has been started. The graduate fellowship program now supports 30 students pursuing studies in Environmental Restoration and Waste Management areas. Another 30 fellows/ scholars are supported through the Minority Fellowship/Scholarship Program. DOE-initiated community college programs for technician training now involve 700 students and 27 faculty. Precollege and public outreach programs related to Environmental Restoration and Waste Management needs have been established at each DOE field office.

These few achievements are drawn from a much larger set and are cited to indicate the direction of progress of technology development in the planning, organization, and execution of Research, Development, Demonstration, Testing, and Evaluation and in building the work force needed by DOE. Other OTD achievements and greater detail regarding organizational planning are presented in Section 2.4 of this document. EM philosophy includes ensuring that facilities transferred to EM can be managed in an environmentally sound manner. Progress made to date confirms the necessity of a success-oriented technology program to ensure the achievement of EM's environmental goals.

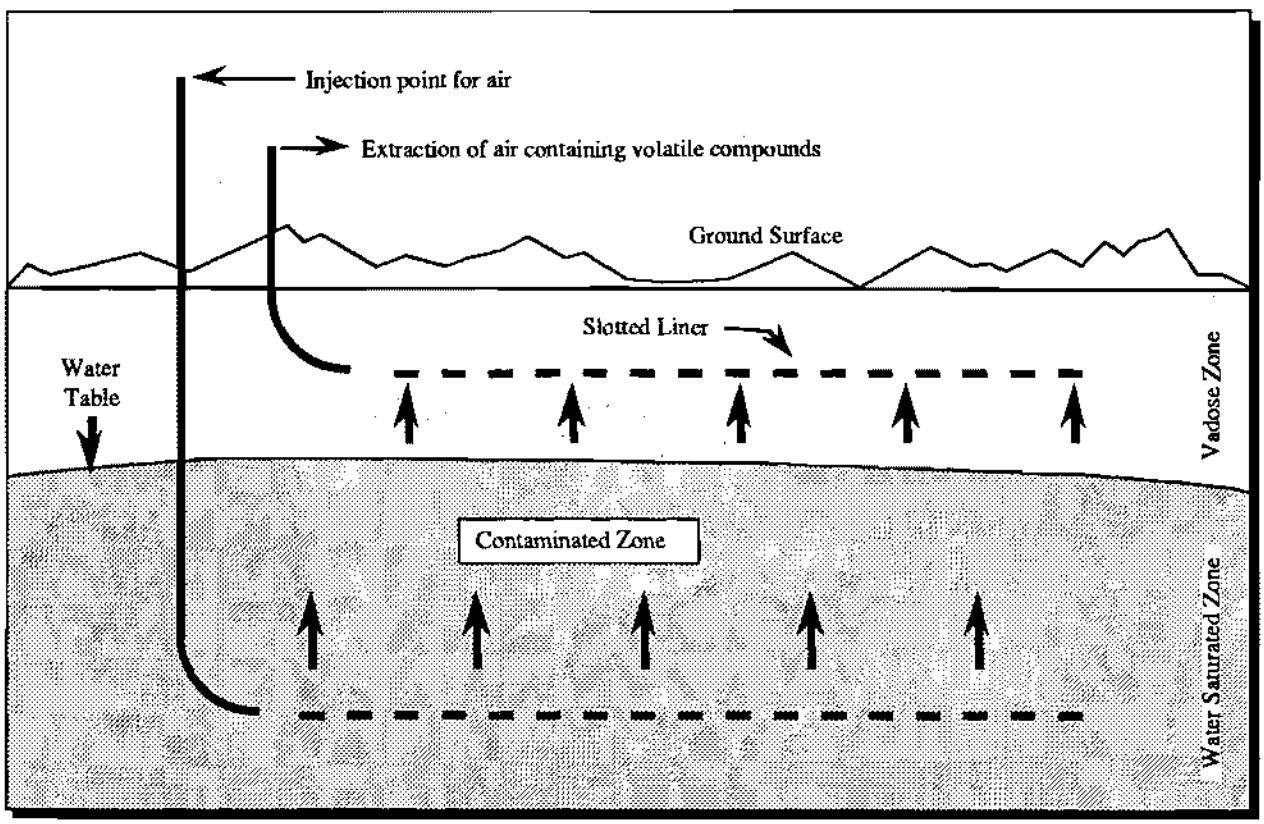


Figure 1.3.6.2. In situ vapor extraction combined with horizontal well drilling, as demonstrated at the Savannah River Site, is significantly more efficient than conventional pump and treat methods.

1.3.6.3 EM PHILOSOPHY: ACCEPTING RESPONSIBILITY FOR SURPLUS OR INACTIVE FACILITIES

EM philosophy includes ensuring that facilities transferred to EM can be managed in an environmentally sound manner.

Facilities that are no longer required for DOE's production or research mission are surplused and must undergo decontamination and decommissioning (D&D). The transfer of these facilities to EM is handled through a formalized process wherein the responsible DOE program (Defense Programs, Energy Research, or Nuclear Energy) for the facility and EM, agree to activities conducted prior to the transfer, and funding levels required to manage the facilities. Once these facilities have been transferred, they will not be transferred back for production or research purposes. DOE, has for many years, conducted environmental restoration and waste management activities under the management of many program offices. With the creation of EM in 1989, these activities were consolidated into a single DOE office.

EM policies for acceptance of facilities and sites, for both environmental restoration and waste management, are applicable to DOE-owned, contractor-owned, or privately owned facilities and sites that are inactive/ surplus and have been wholly or partially contaminated with radioactive, hazardous/ toxic, or mixed wastes or substances as a result of DOE program activities. These EM policies for acceptance of facilities are consistent with the "Addendum to the Memorandum of Agreement Among DOE Offices with Respect to Environmental Management of DOE Facilities," dated March 6, 1990.

The EM acceptance criteria were initially applied to the Feed Materials Production Center (FMPC) during 1990. The purpose of such a formalized transfer document and acceptance criteria was to facilitate the orderly transition of operations from other DOE offices to EM and to provide DOE management with an overview and control of this process. The transfer of FMPC from DP to EM was performed in accordance with such a set of transfer agreement documents.

Presently, DP and EM are coordinating the transfer of a number of Richland Field Office facilities from DP to EM. Facilities that could be transferred include the Plutonium/Uranium Extraction (PUREX) Plant, the Uranium Tri-Oxide (UO_3) Plant, the Plutonium Finishing Plant (PFP), T-Plant, N-Reactor, and associated fuel storage and fabrication facilities. The transfer of these facilities from DP to EM reflects a change in mission at Richland's Hanford site, from one of weapons production, to one of environmental management. These facilities are being considered for transfer into the Office of Waste Operations pending possible use for waste processing and/or subsequent transfer

to the D&D program. The FY 1993 funding associated with the facilities transferred to EM from DP at the FMPC and Richland is identified in Figure 1.3.6.3a. The funding represents the cost of "transition projects." The typical acceptance process for transfer of surplus or inactive facilities or sites is shown in Figure 1.3.6.3b.

TRANSITION PROJECTS

Facilities Transferred to Waste Operations	FY 1991	FY 1992	FY 1993*
Landlord at ID and RL	0	86.7	101.2
Support to Gaseous Diffusion Plants	0	23.1	72.4
Plutonium/Uranium Extraction (PUREX) and Uranium Tri-Oxide Plant	72.3 a) b)	80.0	61.9
Plutonium Finishing Plant (PFP)	70.8 a)	101.5	97.6
N-Reactor	41.3 a)	84.2	21.3
T-Plant	0	0	12.2
K-Area Fuel Storage Basins	0	0	21.3
300 Area Fuel Fabrication Facility	0	0	7.6
TOTAL	184.4	375.5	395.5
Facilities Transferred to Environmental Restoration			
Fernald Settlement Payment	20.5	50.9	0.0
Fernald Site Operations and Landlord	264.5 c)	234.9 d)	314.9
Support for Gaseous Diffusion Plants (GDP)	92.7	81.5	114.1
Landlord at Oak Ridge GDP	4.0	10.0	22.0
TOTAL	381.7	377.3	451.0
Program Direction Additions			
RL and ID Personnel	3.9	28.4	43.0**
GRAND TOTAL - Transfers	570.0	781.2	889.5

a) Funds appropriated under Nuclear Materials Production budget.
b) $34,000,000 transfers to Office of Waste Operations in the fourth quarter of FY 1991.
c) $84,500,000 in Defense Programs in FY 1991.
d) $130,000,000 transfers from Defense Programs; balance comes from within EM.
* FY 1993 dollars represent thevalidated target level.
** These are preliminary estimates that will be refined during FY 1993 budget deliberations prior to congressional budget submission in February 1992.

Figure 1.3.6.3a. Facilities being considered for transition into EM from other DOE organizations. Funding represents the Validated Target Level.

The identification of surplus or inactive sites is a continuing process, and additional sites will be added to the present list of transition projects during the coming years. After coordination and agreement with the program office with responsibility for the facility or site, the field office prepares Activity Data Sheets (ADSs) that describe the work to be completed and the requested funding profile. The budget year that the ADS supports is the earliest possible year of EM funding responsibility. In cooperation with the program office, the responsible field office will prepare an application for the facility or site.

After receiving the completed application, the designated EM organization evaluates the request. Upon satisfactory completion of the application, establishment of respective EM and program office responsibilities, and agreement on the physical transfer/acceptance requirements, the facilities or sites are accepted into the EM Program. Acceptance by EM will be formally documented between EM and the responsible program office.

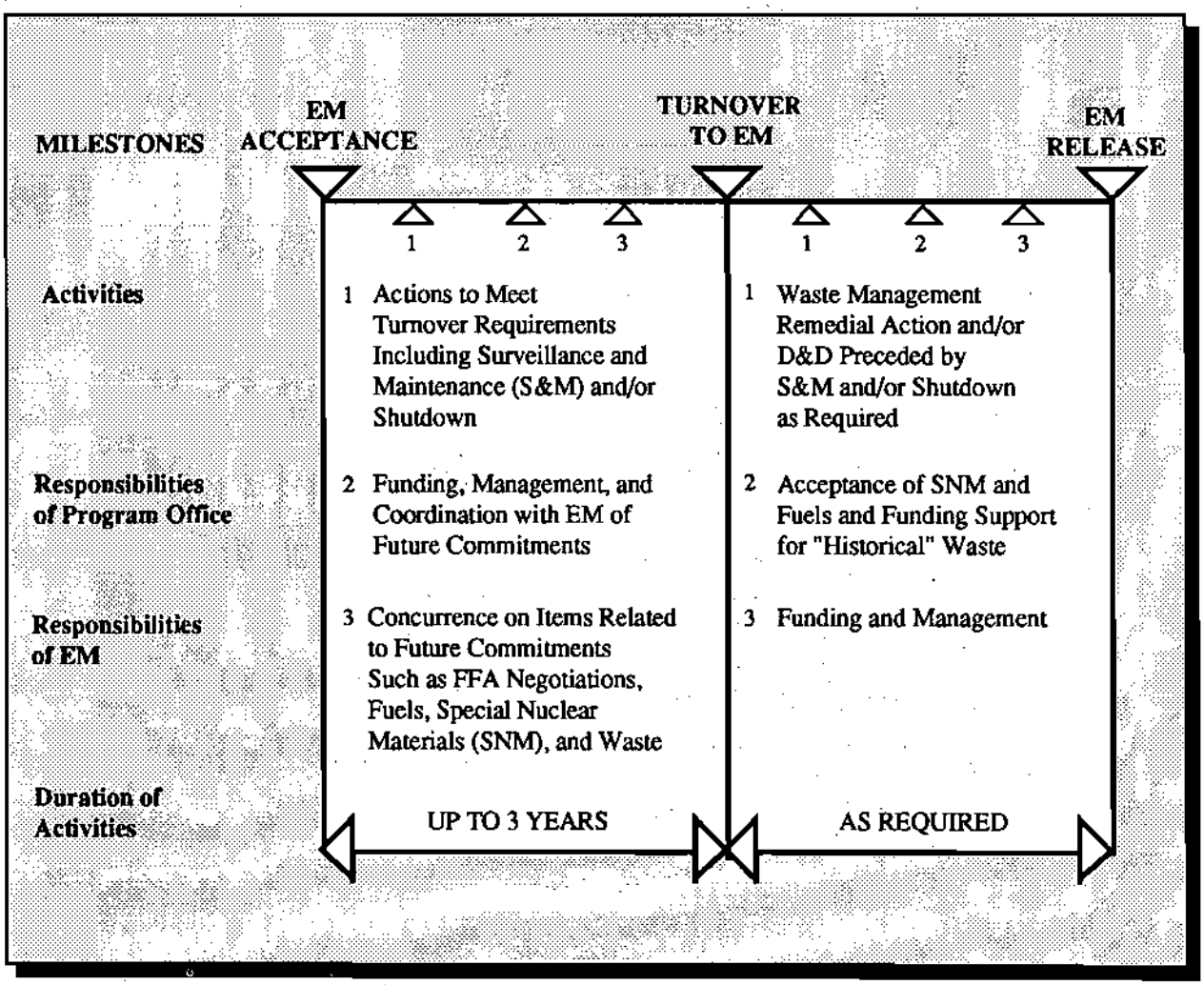


Figure 1.3.6.3b. EM responsibilities after acceptance of a facility for environmental restoration or waste management. (FFA = Federal Facilities Agreement)

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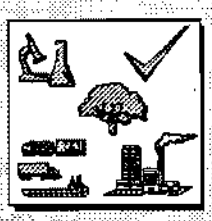
1.3.6.4 EM PHILOSOPHY: PURSUIT OF EXCELLENCE THROUGH QUALITY ASSURANCE



Quality assurance; cost-effectiveness; technical validity; and compliance with regulations to protect public health, workers, and the environment must all be ensured for EM programs and projects. Overlying line management efforts to meet these objectives is an internal, independent oversight organization reporting to the Director of EM.

EM believes that to succeed in its mission and to achieve excellence, it must employ a strong quality assurance component in all of its endeavors. The Office of Quality Assurance and Quality Control (QA/QC) was established to ensure protection of the environment, worker safety, and public health and to guarantee the technical validity and cost-effectiveness of EM programs and projects. The QA/QC mission will be achieved by developing policy and guidance and ensuring independent oversight (e.g., audits, appraisals, technical assessments, safety analyses, self-assessments, and cost evaluations) for EM activities.

Quality Assurance: The foundation for a QA/QC program is based on DOE Orders, EPA requirements, national standards such as ANSI NQA-1, and EM program needs. Effective implementation will allow EM program and project activities to successfully withstand rigorous critique and evaluation by regulatory agencies, the scientific community, and the public at large.

Environmental Compliance: EM believes that independent, internal oversight of its programs and projects will help ensure compliance with applicable environmental requirements. EM has created an independent, internal EM Environmental Compliance Audit Program. The audit program determines the status of compliance with applicable laws and regulations (including DOE Orders) for protection of public health and the environment, as well as the mechanisms that need to be in place to ensure that compliance is achieved and maintained. The audit program tracks findings, identifies deficiencies and their causes, assists in identifying solutions, and verifies their implementation.

National Environmental Policy Act (NEPA) Compliance: NEPA compliance is an important component of the environmental compliance program. EM-wide NEPA compliance guidance is developed and updated, and NEPA reviews are used to identify generic problems and promote the incorporation of NEPA considerations into the planning of EM programs.

Safety and Health Compliance: Safety and health audits and oversight activities are conducted to independently evaluate EM performance against applicable requirements and agreements with other organizations. These activities include internal, independent review of startup and restart of EM projects, facilities, and cleanup activities and review of the adequacy of Safety Analysis Reports, Operational Readiness Reviews, Startup/Restart Authorization Reviews, and Technical Specifications.

Oversight reviews of several facility starts and restarts have yielded action

recommendations to senior EM management. The near-term focus is to develop guidance for actions such as preparation of Safety Analysis Reports and conduct of Operational Readiness Reviews. EM recognizes the urgent need to convert current DOE requirements (that focus on production facilities) to appropriate regulations for waste management and restoration activities.

Cost Evaluation and Technical Validity Assessments: QA/QC provides internal oversight of EM programs and projects managed by the line organizations. To strengthen internal oversight, EM is developing a programmatic oversight roadmap for the Cost Quality Management (CQM) Program. This roadmap will outline the independent oversight functions and how they relate to the functional responsibilities of line management. The CQM is a performance analysis plan to ensure cost-effectiveness, cost benefit, and technical validity in EM activities. CQM will provide an independent assessment of several key issues facing EM:

- project execution system,
- relationships between EM costs and factors outside of the Department's control,
- technology requirements/impacts,
- availability of talent and skills,
- competition for resources, and
- external review groups' oversight.

CQM will improve the EM project management system, technical cost-effectiveness, project definition and reliability of cost estimates, cost reductions and understanding cost trends, and EM's overall performance. Assistance in resolving issues and mitigating deficiencies is provided to the line organizations in the form of policy, guidance, and direct technical support. Cost analysis models have been developed to improve EM's ability to perform cost and schedule estimates. EM-unique cost estimating models and methods will be available for use in FY 1991. In addition, an infrastructure study is under way to assess the potential for hyperinflation in the service sectors supporting EM activities. Cost and schedule self-assessment procedures and standards are being developed for use by the field and line programs.

Audits of EM programs and projects are being conducted to determine what cost estimating, analysis, control, and reduction activities are in place and how effectively they are being implemented. In addition, independent check estimates are prepared on a sample of environmental restoration, waste operations, and technology development estimates. The initial CQM assessment will begin at twelve sites (e.g., Feed Materials Production Center, Oak Ridge National Laboratory, Pantex Plant, Hanford Site, Argonne National Laboratory, Los Alamos National Laboratory, Neveda Test Site, Savannah River Site, Rocky Flats, Idaho National Engineering Laboratory, Kansas City Plant, and Lawrence Livermore National Laboratory) starting in July 1991. The findings from this assessment will be available by January 1992.

Self Assessment: The EM Self-Assessment Program is a fundamental initiative for achieving excellence in EM activities. The program examines results from audits, oversight activities, and other performance indicators, to identify achievements and deficiencies and their causes. Furthermore, the program provides EM managers with the bases for decisions that will lead to improvements in EM performance.

1.3.6.5 EM PHILOSOPHY: ESTABLISHING OPERATING RELATIONSHIPS WITH INDIAN TRIBES

EM is working to establish effective relationships with Indian Tribes under the umbrella of DOE's American Indian Policy.

DOE believes that success of EM program planning will depend, in part, on establishing effective working relationships with governmental parties whose jurisdictions are potentially affected. Anticipating the effects of EM activities on Tribal jurisdictions is important because of the special trust relationship between the Federal government and Tribal governments. EM has made a commitment to strengthen Indian involvement in its planning.

EM program activities that may possibly affect Tribal interests include site cleanup and waste management, transportation, and education/training.

Site Cleanup and Waste Management: DOE installations are located on or adjacent to lands to which Tribes retain treaty-protected rights or to which they have a historical connection that requires Departmental consultation on cultural resource protection.

Transportation: Shipping routes may cross Tribal jurisdictions and raise Tribal concerns for accident prevention, emergency preparedness and response, and community awareness of transportation safety.

Education/Training: Meeting the labor requirements for EM program activities presents educational and training opportunities for Tribal governments.

Recognizing these Tribal interests, EM advocates early, direct Tribal involvement in planning (Figure 1.3.6.5). Indian representatives have taken part in the State and Tribal Government Working Group, the External Review Group, and the Stakeholders' Forum. Tribal participation includes review and comment on drafts of the FY 1993-1997 Five-Year Plan and on initial Activity Data Sheets and Activity Packages. Tribal participation in development of a risk-based prioritization methodology for Environmental Restoration has also been included. Tribal representatives have been involved in transportation accident prevention and emergency preparedness initiatives and in programs to build Tribal environmental planning capacities through education and training in math, science, and engineering. In at least one site-specific case, a process is being developed to allow Tribes access to information in a routine and timely manner before final decisions are made regarding cleanup activities. The Uranium Mill Tailings Remedial Action Program has had cooperative agreements with the Hopi Tribe and Navajo Nation since 1983. Tribes have been reimbursed for their review of assessments and Remedial Action Plans for

sites on their lands and for Five-Year Plan documents.

To further strengthen the effectiveness of DOE relationships with Tribal governments, the Secretary of Energy has recently committed to establishing, in consultation with Tribal representatives, a DOE American Indian Policy. EM planning is receiving guidance directly from the joint DOE/Tribal efforts to establish this Policy. Increased EM attention is aimed to create mechanisms to work with Tribes on a government-to-government basis, with recognition of Tribal authority for resource planning and cultural protection.

Monitoring and Mitigation of Cumulative Impacts to Tribal Interests: Impacts of potential concern to Tribes are sometimes not exclusively attributable to EM activities. At a DOE site, or along a corridor through which DOE materials are transported, activities from several different DOE programs may be under way at the same time. Defense-related activities, for example, may accompany waste management and site restoration activities. Neither set of activities is responsible for significant impacts to Tribal interests. However, the cumulative effect, including effects of EM activities, may be a source of Tribal concern.

In particular, EM acknowledges that Tribes may regard their water rights, treaty-protected fishing rights, and responsibilities for transportation emergency preparedness as potentially affected by cumulative DOE activities. Addressing issues of cumulative impacts to Tribal interests is a group effort. Representatives from the various components of DOE and potentially affected Tribes need to exchange information and identify possible concerns before they reach problem levels.

Specific issues associated with transportation, education, and cultural resources are discussed in the sections that follow.

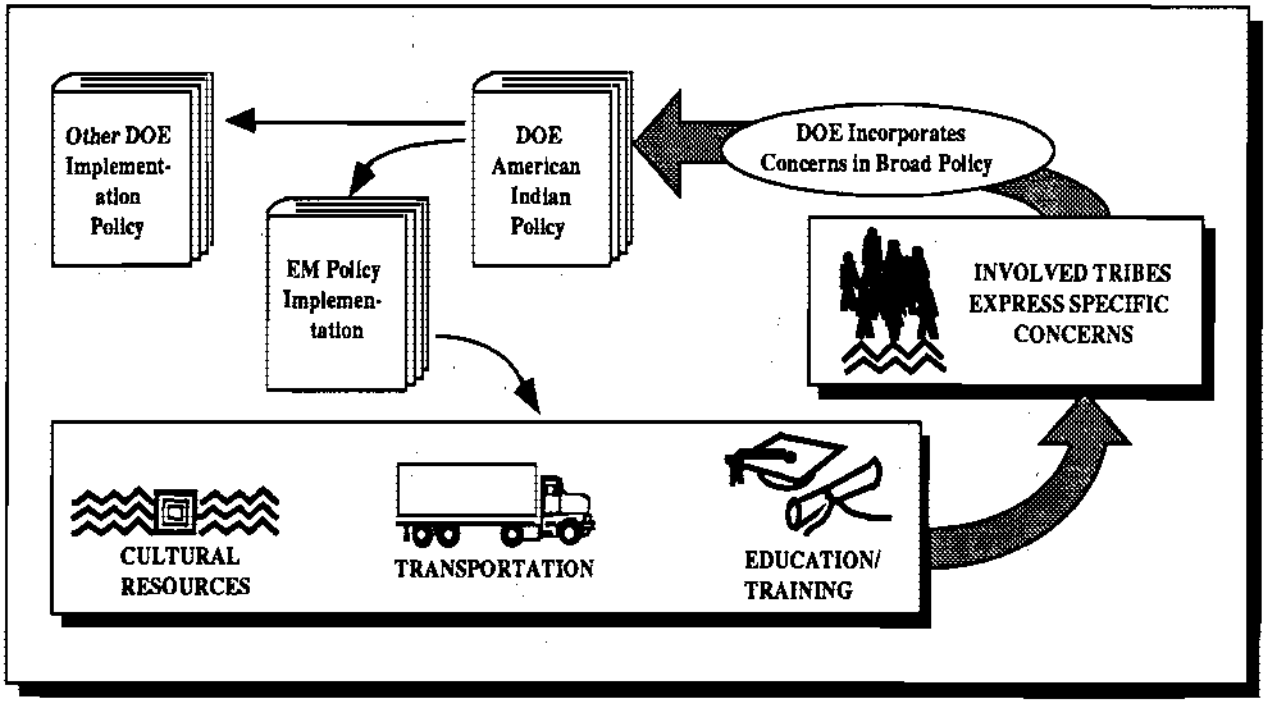


Figure 1.3.6.5. The DOE policies are grounded in the concerns of involved American Indian Tribes.

1.3.6.5.1 EARLY AND OPEN INTERACTION WITH TRIBES ON TRANSPORTATION OF DOE RADIOACTIVE AND HAZARDOUS MATERIALS

Early and open interaction with Indian Tribes potentially affected by DOE's transportation of radioactive and hazardous wastes is a key element of DOE's transportation planning and implementation.

Indian Tribes have been interested in understanding and participating in planning and implementation of DOE transportation activities affecting their lands. Although many Tribes share similar transportation concerns, each has its own specific concerns, needs, and authority structure that must be properly addressed by DOE on a government-to-government basis.

The DOE American Indian Policy will provide the basis for all DOE/Tribal interactions. Building on this foundation, individual programs such as the Transportation Management Program (TMP) will tailor interactions with Tribes to meet the Program's particular mission and requirements.

DOE and its predecessor agencies have been shipping radioactive and other hazardous materials in support of its many programs for more than 40 years. Many of these shipments have crossed Indian lands. With the recognition of the Tribal authority over these lands and DOE's special trust responsibilities, TMP has taken some initial steps, through cooperative agreements and other interactions, to identify areas of Tribal concern and to develop options for working toward resolution. Some of the more frequently voiced concerns and plans for addressing them follow.

Emergency Preparedness and Response: Proper planning, equipment, and response training for radioactive materials transportation accidents is of concern to many Tribes. The TMP has created the position of Manager, Emergency Preparedness Program, to address the planning, coordination, and implementation of DOE response programs concerning emergencies involving radioactive material shipments. Activities are under way to identify Indian Tribes affected by DOE transportation activities and to provide them with emergency response training and, as appropriate, shipment notification through a computerized transportation tracking and communications system known as TRANSCOM.

Economic and Cultural Impacts: Many Tribes depend on businesses located along transportation corridors for their livelihoods. They share concerns over possible public perception of shipments of radioactive materials that could have an adverse effect on their businesses and way of life. Moreover, if there were an accident with a radioactive release, the cleanup could disturb important cultural resources. Through cooperative agreements and other means, TMP hopes to increase public understanding and to address the need to

consider potential Tribal cultural impacts in its planning.

Tribal Interactions: Recent efforts aimed at strengthening the effectiveness of interactions with Indian Tribes share a common goal of involving representatives of Tribal interests as early as possible in the transportation planning process. Because DOE transportation is an ongoing activity, these efforts currently have the appearance of being undertaken on a piecemeal basis. However, cooperative agreements are being developed for Tribes whose jurisdictions are affected by future shipping campaigns such as the Waste Isolation Pilot Plant and high-level waste programs. Transportation concerns have also been discussed by the EM Program groups such as the State and Tribal Government Working Group. In addition, TMP has sponsored Tribal culture seminars for DOE and DOE contractor personnel to help them understand basic Tribal concerns and needs. Finally, with the development of a DOE American Indian Policy, DOE expects to have a more coordinated and effective liaison with appropriate Indian Tribes ensuring that their concerns are understood and addressed.

1.3.6.5.2 EDUCATIONAL AND TRAINING ASSISTANCE TO MEET DOE INFRASTRUCTURE NEEDS

Because EM activities are of concern to Indian Nations potentially affected by these activities, and because Tribes will require skilled work forces both to monitor their own lands and to participate in DOE site cleanup, transportation, and long-term waste management activities, EM is emphasizing support for Tribal education and training at all levels from grade school to graduate school.

The success of the EM mission will depend, in part, on establishing effective working relationships with governmental parties whose jurisdictions are potentially affected by program planning decisions. Anticipating the effects of the EM planning process and activities on Tribal populaces and resources is particularly important because of the special relationship the Department has with Tribal governments and the commitment the EM program has made to strengthen Indian involvement in its activities.

Potential EM Impacts on Tribal Interests: The EM program may possibly affect Tribal interests in four ways: site cleanup, waste management (including disposal sites), transportation, and technology development. Successfully accomplishing EM objectives will require educational infrastructures capable of producing the talent required for both the economic development and the legal needs of affected Tribes. For example, Tribal representatives should be part of DOE's team in preparing cultural resource plans mandated under the Federal Cultural Resource Laws and the American Indian Religious Freedom Act (P.L. 95-341). Consistent with EM's commitment to provide job opportunities to communities affected by its planning decisions and to assist in strengthening Tribal environmental capacity for meaningful Tribal participation on DOE site cleanup, transportation, and long-term waste activities, part of EM's education goal is to work with Tribes and appropriate Indian representatives to develop mutually beneficial education and training initiatives.

Meeting the EM Goal for Indian Education and Training: EM's Office of Technology Development has the primary planning responsibility for education and training initiatives designed to meet EM's human resource needs for Indians both on and off Tribal lands. EM's goal in this area is, in cooperation with Tribal authorities, to plan an education and training program that taps all available Indian talent by ensuring equal access to all affected Tribes and individuals, including urban Indian populations.

This goal is being met. At the national level, EM is in consultation with Tribal schools to design an educational model that will recruit and retain Indian youth pursuing careers in environmental sciences. Under a grant, the American Indian Higher Education Consortium is supporting teacher training, identifying curriculum development needs in the Nation's 27 Tribal-controlled 2-year colleges, and identifying technology transfer opportunities and appropriate linkages to DOE facilities and laboratories.

At the regional level, DOE's operations offices are in consultation with Tribes to identify appropriate educational outreach

activities. In California, D-Q University, a Tribal school, designed an educational model in collaboration with State Indian agencies to retain Indian youth in grades 7-12 and to introduce them to environmental sciences. In New Mexico, DOE helped the Navajo Community College obtain equipment for its environmental laboratory.

Future Initiatives: Future education and training planning will continue in this spirit, based on consultation and cooperation with appropriate Indian representatives on activities, including:

- Identifying and designing educational models for recruiting and retaining Indians from kindergarten through graduate school and encouraging them to pursue careers in environmental sciences;
- Identifying how DOE can help meet classroom, laboratory, and field equipment needs for Tribal educational institutions and Tribally sanctioned institutions;
- Identifying financial assistance sources for Indian students interested in pursuing careers requiring a background in mathematics and environmental sciences;
- Identifying subcontracting opportunities for work force development training; and
- Identifying technology transfer opportunities to benefit both the government and Tribally owned businesses and integrating these businesses into the American Indian education system.

In addition to opportunities involving government-to-government cooperation between Tribes and DOE, the EM Program will also coordinate its efforts with other Federal agencies that have education and training responsibilities.

1.3.6.5.3 EFFORTS TO IDENTIFY AND PROTECT CULTURAL RESOURCES AND GUARANTEE ACCESS FOR TRIBAL MEMBERS

A central planning objective for EM is to ensure that appropriate consultation with Tribal leaders will guarantee the protection of Indian cultural resources.

DOE sites encompass important cultural resources that are potentially sensitive to disturbance from environmental restoration and waste management activities. By developing an American Indian Policy, DOE is strengthening its commitment to comply with applicable treaty, statutory, and regulatory requirements that apply to cultural resources. A central planning objective for EM is to strengthen its consultations with Tribal leaders regarding the protection of these important resources. In addition, EM's planning process is mindful of the need to respect American Indian religious freedoms and to consult with Tribal leaders to develop site access policies that do not unnecessarily restrict the exercise of traditional Indian spiritual practices and treaty rights.

Within planning guidelines prepared by the Office of Environment, Safety and Health (EH), DOE field offices are principally responsible for cultural resource management activities. Particular attention has been given in recent years to creating an integrated program. This program would provide for inventorying resources, establishing the regional and historical significance of these resources, and developing a point-of-contact system, as well as consultation procedures that can be quickly implemented when field monitoring activities encounter previously unidentified resources. Integrated cultural resource management planning programs, developed in close consultation with associated Tribal groups, are either in place or under development at several DOE installations. At other DOE facilities, specific planning activities are being completed to bring the facility into full compliance with the American Indian Religious Freedom Act. Training and orientation programs for field office personnel throughout the DOE complex have been instituted in recent years to heighten awareness of cultural resource protection issues and requirements (Figure 1.3.6.5.3).

As with other resources whose protection is recognized to be in the public interest, new requirements are being developed regularly. Most recently, for example, Congress enacted the Native American Graves Protection and Repatriation Act (PL 101-601), heightening EM's need to ensure that appropriate procedures and funding are in place for ongoing consultation with affected Tribal governments. Within the overall framework and authority of the Department's American Indian Policy, EM will also add cultural resource management compliance to its internal program audits. It will regularly update its cultural resource management compliance guidelines and develop other ways for EM cultural specialists to exchange information with one another. Finally, EM expects to provide training opportunities for Tribal members in cultural resource protection.

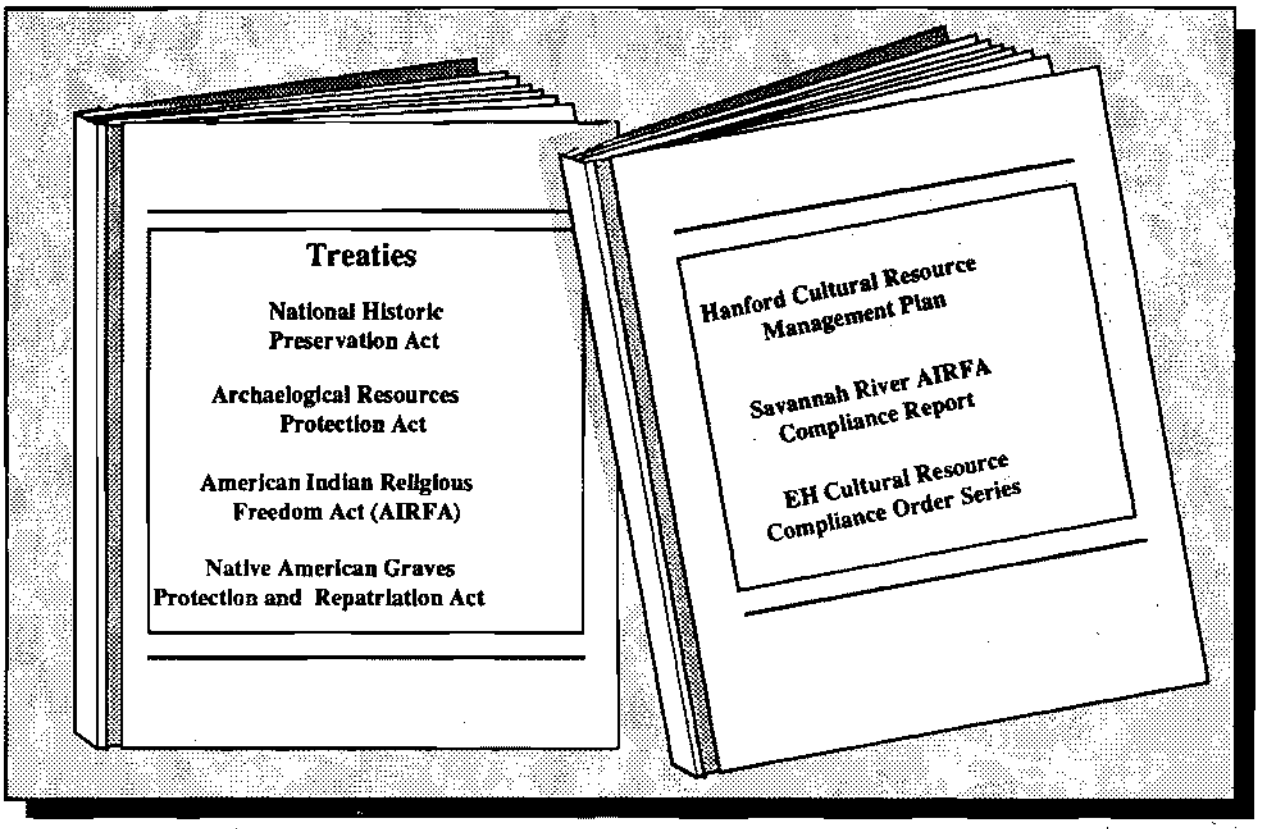
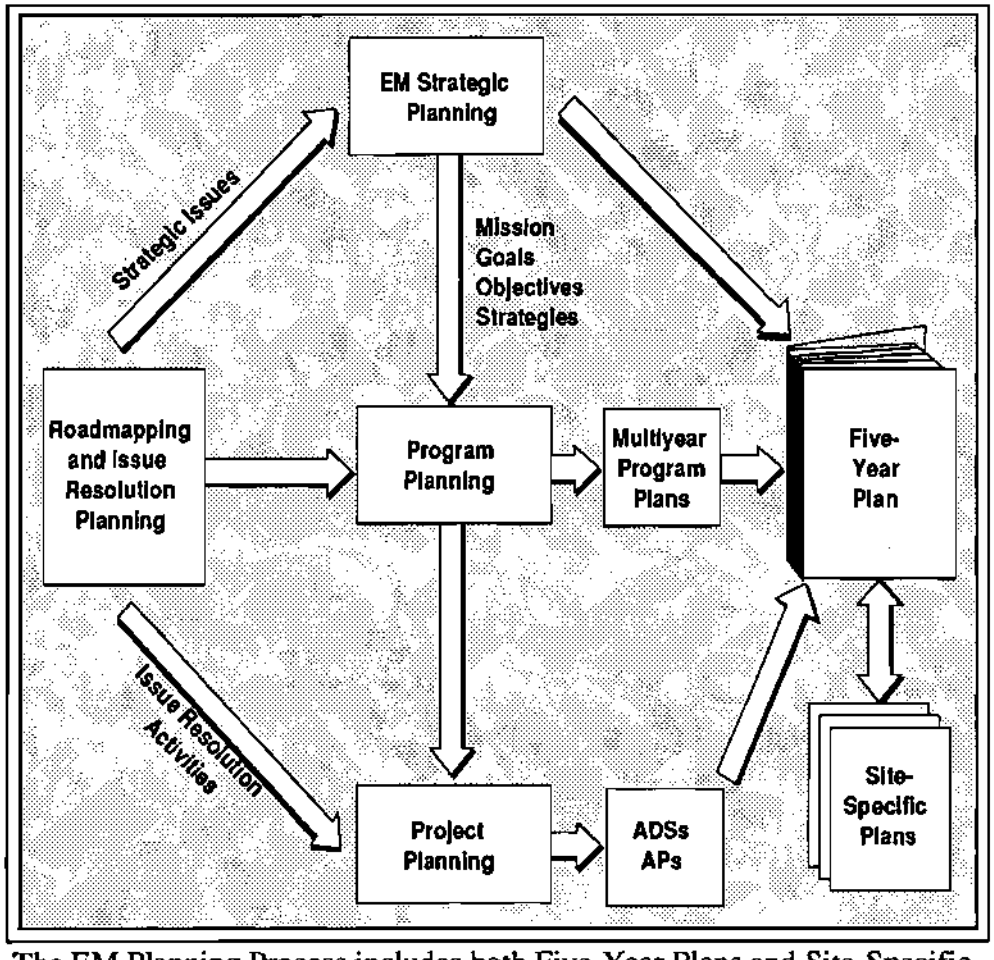


Figure 1.3.6.5.3. DOE is committed to strengthening consultation with Tribal governments regarding cultural resource protection.

1.4

The Environmental Restoration and Waste Management Planning Process



The EM Planning Process includes both Five-Year Plans and Site-Specific Plans as outputs and relies on the Roadmap Methodology and Issue Resolution Planning to ensure its comprehensiveness.

1.4.1 THE EM PLANNING PROCESS

EM has designed its planning process to effectively manage its programs and to help ensure program success. Main components of the process include a clearly communicated strategic plan, operational roadmaps that drive issue-oriented planning, active external review and public participation, and a solid interface with budgeting and program execution.

EM has launched several initiatives to establish better planning, budgeting, and control systems for its programs. These initiatives are united by the philosophy that sound planning should guide budgetary and management decision making and that setting clear priorities is essential to program success. These initiatives include strategic planning, the EM Five-Year Plan, EM and program management plans, and site-specific plans. The main inputs into the planning process are roadmaps, activity data sheets (ADSs), activity packages (APs), and prioritization methodologies.

Planning: The EM planning process starts with the development of a strategic plan. This strategic plan (Section 1.3 of this Plan) reflects a shared vision of the future and the organizational mission. From this strategic plan, and from roadmaps that are being conducted concurrently (Section 1.4.7), guidance is developed for updating program plans. These program plans are described in ADSs, which are rolled up to goal-oriented groupings called APs. Both ADSs and APs are initially submitted to Headquarters in January. These are reviewed, additional guidance is provided, and a second submittal is provided in March. The March submittal forms the basis of the draft Five-Year Program Plans (Section 2 of this Plan) and later budget formulation. The Five-Year Plan forms the basis of Site-Specific Plans (Section 1.4.4.1). Both the Five-Year Plan and the Site-Specific Plans are issued for formal public comment periods designed to conclude at the beginning of the fiscal year.

At any one time, plans for multiple fiscal years are in various stages of development. For this Plan, FY 1993 is the planning year, the budget year is FY 1992, and the execution year is FY 1991. As issues are identified during either the budget development or execution, the plans for FY 1993 and beyond are adjusted.

Budgeting: EM funding is determined through the Federal budget process, which may take more than one and one-half years from start to finish. This process has two main phases: (1) budget formulation, where an initial budget is created, revised, and submitted to Congress, and (2) enactment, where funding is authorized by Congress, appropriated to DOE, and allocated to DOE programs.

Scope, cost estimates, milestones, regulatory drivers, narratives, and other information included in Activity Data Sheets, were developed by DOE field offices in conjunction with the Headquarters program offices, was used to support preparation of the two cases in the Five-Year Plan and an additional case used for the EM budget submission. Following field and Headquarters review, the EM budget proposal undergoes internal DOE review. A

request is then submitted to the Office of Management and Budget (OMB). Following OMB review the President's budget is submitted to Congress. Congress may rework it and eventually enact a budget that allows DOE to begin the work planned for that fiscal year.

Execution: During execution, EM monitors program progress against budgets and plans. This control effort is used to improve delivery by EM organizations and to feed planning and budgeting efforts in future years. As its planning process matures, EM is placing increased emphasis on management tracking systems and linking information about program execution with budget and planning data. To this end, EM is developing an automated planning, budget, and execution system that will serve management by providing complete and timely data about EM's work—past, present, and future.

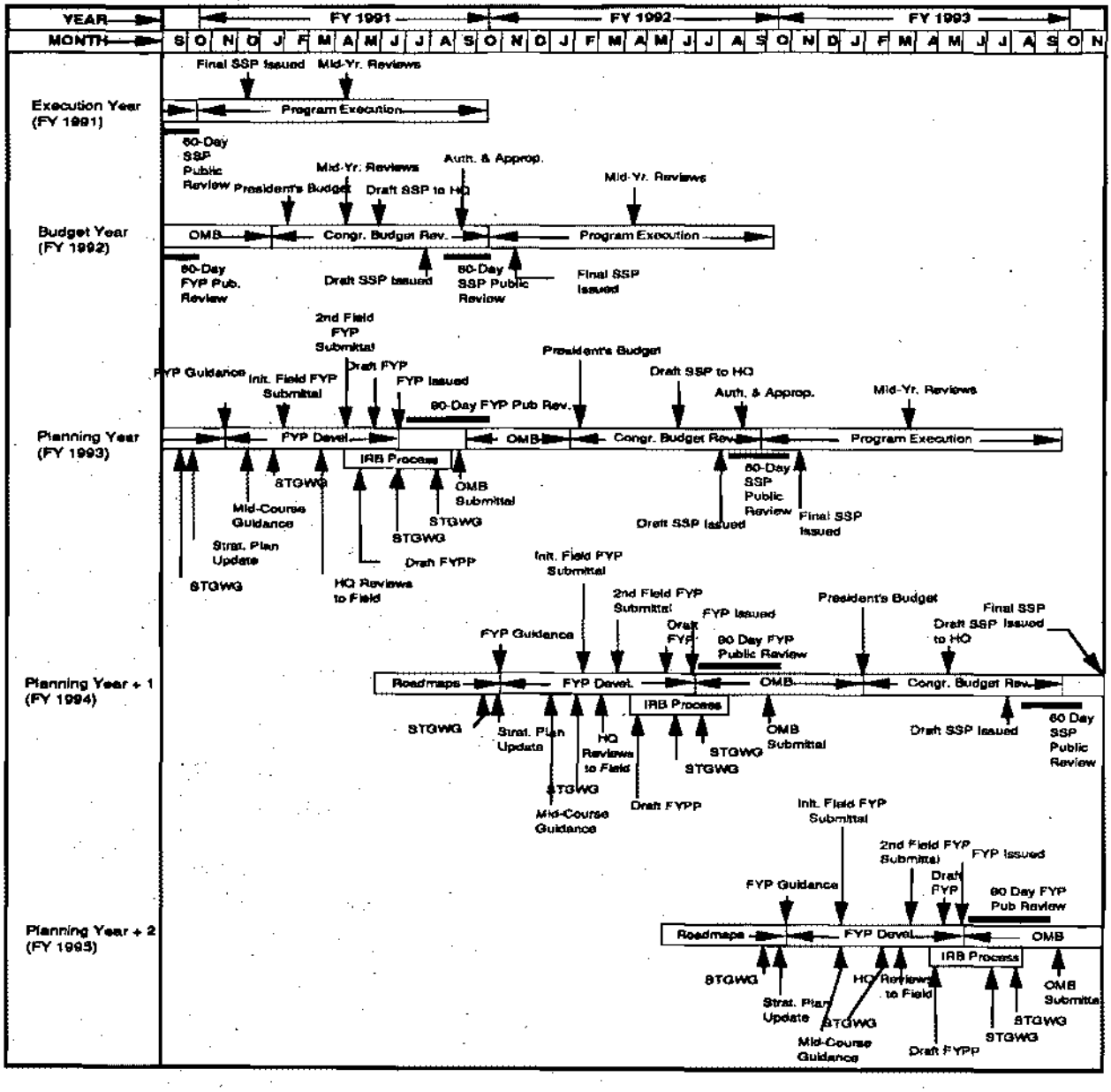


Figure 1.4.1. The integrated planning budget and control system identifies major milestones in the development and execution of the annual EM programs. (SSP=Site-Specific Plan, FYP=Five-Year Plan, FYPP = Five-Year Program Plans, STGWG=State and Tribal Government Working Group, IRB=Internal Review Budget)

1.4.2 PROGRESS: WHAT IT MEANS; HOW TO MEASURE IT

While completed cleanup is a universally accepted measure of progress, each EM program requires different measures of progress.

Establishing efficient management, reaching agreements, and taking procedural steps are important but are not by themselves sufficient measures for reporting progress. Assessments, permits, agreements, conceptual designs, and published Environmental Impact Statements are important milestones for managing programs in DOE and for keeping the Office of Management and Budget and congressional oversight committees informed. These organizations, as well as DOE, need this information to carry out various responsibilities and to manage program progress. These measures need to be supplemented to allow the public, especially those living in the vicinity of DOE sites and facilities, to assess the pace of the program's progress.

EPA faced a similar quandry when reporting the progress of the Superfund Program. For those sites in the Superfund Program, the site evaluation and cleanup process could take 10 to 14 years before a site could be removed from the National Priorities List (NPL). Coupled with the fact that the EPA cannot simultaneously initiate actual cleanup at all sites on the NPL, this 10- to 14-year process resulted in the perception that little progress was being made. The public measured progress by the number of sites that had been cleaned up and removed from the NPL, while EPA measured progress by intermediate steps such as the number of Remedial Investigations/Feasibility Studies (RI/FSs) under way.

EPA conducted a management review of the Superfund Program that made recommendations for clearer measures of progress. The Superfund Program is now reporting progress using environmental indicators, which are collected and aggregated into three categories: (1) emergency actions to address acute threats at NPL sites, including stabilizing waste to prevent fire or explosion and removing, treating, or containing hazardous waste; (2) taking actions to achieve health and environmental goals, including cleanup initiation and progress; and (3) removing quantities of waste from the environment (e.g., cubic yards of solid waste, gallons of liquid waste, and gallons of groundwater).

As with some Superfund projects, environmental restoration and waste management projects and activities tend to have long schedules with specified administrative steps and authorizations before actual cleanup or other activities can begin. EM has tried to learn from EPA's experience in developing an approach to measuring progress. Thus, EM will incorporate indicators of tangible physical progress together with critical compliance milestones in its tracking and reporting.

But not all EM program activities are cleanups. Corrective activities are needed to bring active and standby DOE facilities (those currently out of compliance with applicable local, State, Federal, and DOE requirements) into compliance in an expedient manner. The Waste Operations Program manages, accounts for, and disposes of radioactive, hazardous, mixed, and sanitary wastes in a safe and environmentally sound manner. The Technology Development Program develops new technologies to solve environmental and waste operations problems and improves the effectiveness, efficiency, and safety of the activities; transfers technology to industry, government entities, and academia; and enhances educational programs and initiatives. Therefore, each EM program area requires a different set of measures of progress fitting the specific program's mission.

EM has, therefore, been investigating potential measures for assessing progress. To date, a list of potential measures has been compiled (Figure 1.4.2). EM has collected information on some of these measures and expects to begin regular reporting during FY 1992. In the meantime, EM is reporting accomplishments to date in Section 1.2.1, as well as in Sections 2 and 3 of this Five-Year Plan.

MEASURES OF PROGRESS

Corrective Activities:
- Number of facilities out of compliance at start of period
- Number of facilities brought into compliance during period
- Formal compliance agreements
- Number and types of permits issued

Environmental Restoration:
- Number of removal actions completed
- Number of RI/FSs initiated
- Number of Records of Decision made
- Number of cleanups completed
- Volume of material treated
- Volume of material contained
- Gallons of groundwater treated
- Number of cleanups initiated

Waste Operations:
- Amount of waste characterized (gallons, cubic yards)
- Amount of waste packaged and/or treated
- Amount of waste disposed of
- Waste minimization actions taken, and estimates of amount of waste no longer produced each year

Technology Development :
- Number of Integrated Demonstrations/Integrated Programs begun and currently in progress
- Number of college and university students trained, matriculated, and entering the work force
- Number of training programs currently in place
- Number of DOE personnel retrained
- Number of nuclear shipments made

Figure 1.4.2. EM expects to report in the FY 1994-1998 Five-Year Plan on progress using some of these potential measures.

1.4.3 NATURE AND EXTENT OF PUBLIC INVOLVEMENT IN 5-YEAR PLANNING

Because EM recognizes that the public has a vested interest in EM's decisions, EM has been expanding opportunities for early public involvement in 5-year planning.

EM has developed a variety of methods to facilitate public involvement in the 5-year planning process and other EM program decision-making activities. EM facilitates public involvement in the 5-year planning process by holding early public meetings during the development of basic input to the Five-Year Plan, by scheduling a formal review of the draft Five-Year Plan by the State and Tribal Government Working Group (STGWG) and the Stakeholders' Forum, and by ensuring that public comments on the public Five-Year Plan are responded to in the subsequent Five-Year Plan. Public comments on Site-Specific Plans (SSPs) influence future site-specific and national 5-year planning processes.

Mechanisms to Facilitate Public Involvement: From its inception, EM's 5-year planning process has emphasized the need for external involvement and review. In this regard, EM created several mechanisms to facilitate external involvement: STGWG, the Stakeholders' Forum, public review of the Five-Year and Site-Specific Plans, and the External Review Group to focus on issues of prioritization.

STGWG constitutes an important mechanism for incorporating the views and concerns of the affected external parties in EM planning and decision-making activities. STGWG now includes participants from 16 States, three Northwestern Indian Tribes, three associations representing State governments.

STGWG held its tenth meeting May 15-17, 1991. The purpose of this meeting was to provide comments on the predecisional draft of this third Five-Year Plan. The following represents a sampling of STGWG member comments:

- For STGWG to effectively contribute to the 5-year planning process, the organization needs to be involved at an earlier stage in the Five-Year Plan development process.
- There are a number of places in the document where DOE appears to be backing away from the its 30-year cleanup goal. DOE needs to change any language that appears to excuse EM from a 2019 completion date.
- While the document contains much good information, it needs to be better organized. Specifically, accomplishments should be listed up front, additional detail is required on how the money will be spent, obstacles to meeting the 30-year goal should be discussed, and the Five-Year Plan needs to include more detail on what EM is doing to overcome identified obstacles.
- The Five-Year Plan needs to be a more positive document. Progress to date needs

to be highlighted more effectively. While the consolidated summaries in Section 3 are good, they do not show performance. Additionally, the Five-Year Plan should explicitly track accomplishments against planned milestones.

The annual Stakeholders' Forum provides an opportunity for input into the Five-Year Plan from a group of interested parties representing Indian Tribal organizations, trade unions, education associations, environmental and public interest groups, professional and technical societies, and industry. The second meeting of the Stakeholders' Forum was held on May 19-21, 1991. The following constitutes a representative sampling of Stakeholders' comments:

- A greater discussion needs to appear in the Five-Year Plan about work force needs over the next 5 years and how to maintain continuity of employment. The Five-Year Plan should also place greater emphasis on health and safety concerns of the work force and surrounding communities. The Five-Year Plan does not indicate what health, safety, and environmental impacts have resulted from EM cleanup and disposal activities. It also needs to discuss the value of independent oversight from government agencies such as the Occupational Safety and Health Administration.
- The draft Five-Year Plan was deficient as a planning document because it does not include intended accomplishments, a way to achieve them, and the evaluation of progress to achieve them. The Five-Year Plan needs to show what commitments were made in past Five-Year Plans, which ones were accomplished, why others were not, and which ones are anticipated not to be accomplished in the future and why.
- DOE's process for public involvement still needs to be improved. The greatest weakness is a lack of public involvement and communication at the local level. To improve relations with local communities, DOE needs to consider creating local advisory committees.
- Education needs to have a stronger emphasis in the Five-Year Plan. With regard to grades K-12, DOE should support the development of appropriate curriculum materials with specific goals and objectives. The Five-Year Plan should also include college training in the environmental sciences for future K-12 teachers. There should also be specific programs to attract women and minorities to enter the scientific and technical fields related to environmental management.

This Five-Year Plan has been reorganized so that accomplishments are summarized in the Executive Summary. Moreover, EM has removed or rewritten language that appeared to back EM away from its 30-year cleanup goal. EM also supports STGWG's earlier involvement in 5-year planning and has encouraged the development of proposals for facilitating earlier involvement. EM is also committed to implementing an accomplishments tracking system that will allow the FY 1994-1998 Five-Year Plan to better measure accomplishments against established program milestones. More detailed discussions of STGWG and Stakeholders' concerns with the draft of the Five-Year Plan are included in Appendix E.

Desire for Earlier External Participation: While affected and interested parties have welcomed the opportunities to comment, STGWG has stressed the need for greater input by regulators and the external organizations at the beginning of the EM Five-Year Plan development process. These organizations also suggested broadening public participation.

EM responded to these comments by requiring field offices to hold public meetings in early March. These early public meetings have three purposes: (1) to explain to the public and regulators how the EM priority systems work and how the field offices have conducted their initial evaluation and ranking of the Activity Data Sheets (ADSs); (2) to allow the public and regulators to review ADSs and determine whether these priorities are consistent with their concerns; and (3) to incorporate these comments in the development of both the subsequent Five-Year Plan and the EM budget for FY 1993. As with any new process, the success of these meetings varied. EM still has a long way to go before this aspect of the planning can be considered successfully implemented.

EM's commitment to early and broadened public involvement is also reflected in the development of SSPs. Starting this year the SSPs are to be developed and released shortly after this Five-Year Plan is issued. Field offices will hold public meetings on their SSPs with the intent of incorporating public comments into the next SSP. EM also recognizes that the public deserves timely responses to its comments. Consequently, each field office is required to develop a comment response document upon completion of the public review process.

External Involvement in the Programmatic Environmental Impact Statement (PEIS) Process: External parties are influencing the course and implementation of the EM program in ways that are not directly related to the development of the Five-Year Plan or SSP. The development of the PEIS under the National Environmental Policy Act, which focuses on the entire integrated EM program, also provides an important mechanism for facilitating meaningful public involvement in program planning and decision making. From December 3, 1990, through February 7, 1991, DOE held 23 scoping meetings to solicit input from the public and interested groups. DOE analyzed public comments from each of these meetings as well as additional written comments to establish the scope of the PEIS.

Currently, EM is preparing an Implementation Plan (IP) that will incorporate the results of the scoping process and the DOE analysis of what the PEIS should include. The IP will receive public review and comments. Following completion of the IP, DOE will issue a draft PEIS for public comment. Public participation will also include formal meetings at which DOE officials can address the public's questions and concerns. The final PEIS will address the public comments.

Informing the Public: The general public cannot be expected to effectively contribute unless it has been adequately informed of various program alternatives and their consequences. Consequently, EM is developing programs, informational materials, and exhibits to inform the public about current and planned environmental activities. During FY 1991, for example, EM published an introduction to the EM organization, listing specific Corrective Activities and Environmental Restoration, Waste Operations, and Technology Development operations and plans.

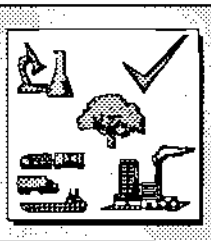
EM's public communication and involvement programs are seen as mutually beneficial; the programs help EM better understand public needs and concerns while informing the public of DOE's multifaceted technical and managerial responsibilities and challenges. EM's long-term goal is to develop more cooperative program decision making.

A comprehensive public participation program is currently being established that

will address the entire scope of EM activities. This program will coordinate the public participation events of the various EM activities at Headquarters and ensure that these events are integrated into field office public participation programs. EM is currently exploring new ways to enhance public participation in future environmental restoration activities.

Past Five-Year Plans have expressed DOE's commitment to a culture founded on the principles of openness, responsiveness, and accountability. DOE recognizes that good intentions are never enough and that it has a long way to go before it can say that it has fully met this commitment. Institutionalizing new behavior patterns and norms is never easy. It will require the long-term involvement of external parties and DOE officials in a two-way communication process that (1) encourages external parties to make their views known and (2) responds to these views in a timely and substantive way.

1.4.3.1 SUMMARY OF PUBLIC COMMENTS ON FY 1992-1996 FIVE-YEAR PLAN



DOE considers and responds to each public comment on the Five-Year Plan in preparing updates.

It is DOE's policy that each public comment on the Plan receives a response. These responses are detailed in Appendix C. For the FY 1992-1996 Five-Year Plan, 99 comments were identified from 12 sources, as summarized below in the following categories. Comments and responses are detailed in Appendix C.

General EM Programs: The 15 comments in the "general" category address EM-wide topics. Four comments referred to the lack of DOE funding for the planned compliance and cleanup. Many sources noted specific examples where DOE did not request sufficient funds to accomplish planned EM activities. Several comments (three) expressed concern about the future reopening of Rocky Flats (RF). Other comments dealt with topics including the desire for better characterization of waste at DOE sites and the need for near-term goals rather than a 30-year goal.

The cleanup and waste management activities of EM are considered a very high priority within DOE and the Federal government. EM feels that sufficient human and financial resources are essential to managing the program and that technologies to achieve its goals are also critical to success. These and other issues mentioned by the commentors point to the need for an issue-oriented planning process. Toward that aim, EM is embarking on a major expansion of its roadmapping efforts to identify the human, financial, and technical resources necessary to achieve its goals (Section 1.4.7).

Public Involvement: The main concern addressed in the 22 comments in this category referred to the increased need for public involvement in all aspects of the DOE decision-making process. Reviewers noted that meaningful and significant participation is necessary if the new DOE culture is to succeed. EM recognizes the need for increasing public involvement in planning its activities and has taken steps this year to provide the public with opportunities to get involved in the early stages of this Plans development (Section 1.4.3).

Environmental Restoration (ER): Many of the 28 comments in this category dealt with the cleanup process taking place at individual sites. For example, one reviewer noted the Five-Year Plan listed one date for a draft Remedial Investigation report, while another document listed a different date. Other (10) comments on the actual cleanup process involved similar discrepancies between actual and planned activities.

Five of the comments involved DOE funding for planned cleanup activities. Reviewers were concerned that the lack of funding for site cleanup reflected a lack of DOE

commitment. One reviewer commented that the funding for a particular site was too low to be effective. Other comments questioned DOE priorities for funding. Reviewers expressed a concern that DOE Headquarters was shortchanging the western sites and giving funding priority to the eastern sites.

DOE is committed to the 30-year cleanup goal. That commitment has translated to significant increases in annual funding since the initiation of the EM program. Funding estimates for this Plan are discussed in Section 1.2.4.1 for EM in general. Section 2.3.1.1 includes discussion of the funding needs of the ER program. The comments point out the need for a sound method of prioritization. EM has been working with representatives of State, Tribes, EPA, environmental interest groups, and others to develop such a system. These efforts are discussed in Sections 1.4.6.2 and 2.3.1.3.4.

Waste Operations: This category received the most public comments (31), and the Waste Isolation Pilot Plant (WIPP) was the subject of the majority (16) of those comments. The concept of retrievable storage generated both favorable and unfavorable responses. More reviewers (nine) commented on WIPP-related transportation issues than on any other topic. Some questioned the safety of moving dangerous wastes long distances. Many comments suggested leaving Hanford waste onsite and monitoring it closely to avoid having to ship it to New Mexico. Another major concern was the unknown number and schedule of potential WIPP shipments.

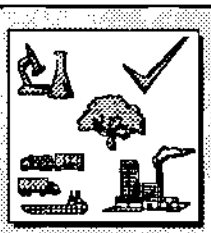
Reviewers supported DOE's integration of Tiger Team findings, A-106 pollution abatement planning, and 5-year planning as a comprehensive approach to compliance and cleanup. Other topics included DOE's definition of high-level waste, the need for DOE to ensure timely compliance with all applicable regulations, the need for separate funding for lawsuit settlements, and other waste-related concerns.

DOE's planned activities associated with WIPP are specifically discussed in Section 2.2.3.2.1. Additional discussion of transportation, including the need for additional planning concerning the transport of waste to WIPP, is included in Section 2.5. Many of the other waste management issues are discussed in Section 2.2. The high-level waste program is the topic of a cluster of modules under Section 2.2.3.1. DOE is committed to bringing its operations into compliance with all environmental regulations. This goal is discussed in a number of places throughout the Strategic Plan portion of this Five-Year Plan (Section 1.3).

Technology Development: Of the three comments on Technology Development, multiple sources commented on the need for more and better trained DOE staff. Comments also indicated a need for new technologies to be developed by university and national laboratory consortia.

EM agrees with the need for more and better trained DOE staff. As discussed in Sections 1.3.4.1 and 1.2.4.2, EM is attempting to identify its personnel needs throughout the complex and to initiate the training programs. The educational initiatives discussed in Section 2.4.6.3 are designed to ensure that an adequate number of personnel are skilled in the scientific and engineering fields that EM requires.

1.4.4.1 FIVE-YEAR PLANS AND SITE-SPECIFIC PLANS



The Site-Specific Plans (SSPs) apply the overall strategic goals and commitments published in the Five-Year Plan at a field level, incorporating site-specific and local public considerations.

SSPs document planned waste operations, environmental restoration, and technology development activities at specific DOE sites focused on the upcoming fiscal year. As field office-level documents, they are the primary means for demonstrating the relationship of local cleanup and compliance activities to broad environmental goals set forth in the Five-Year Plan.

While the format and content of the SSPs vary among sites, they generally serve as an important channel for conveying information to regulators, the local public, special interest groups, and other DOE organizations. Because the SSP development process involves public meetings and the development of Comment Response Documents, SSPs serve to sensitize EM decision makers to local perspectives and concerns.

Consistency Between Five-Year Plan and SSPs: Previous Five-Year Plans have not completely fulfilled the objective of serving as a strategic guidance document for individual SSPs due to scheduling and coordination problems. To ensure that the Five-Year Plans and SSPs were more synchronized and consistent in terms of timing, scope, and dollars, DOE conducted a formal review of the SSP planning process in late 1990. This review process resulted in the development of a paper outlining the following recommendations, many of which have been incorporated into the Five-Year Plan-SSP development process:

- SSPs should be issued after the Five-Year Plan (in late summer), not in December.
- The FY 1991 SSPs will focus on planned activities in FY 1992 based on the President's request. They will also discuss FY 1990 and 1991 progress and will briefly outline strategies for FY 1993-1997. All of the SSP discussions will be in accordance with this Five-Year Plan.

To demonstrate EM's commitment to public participation in program planning, the release of the SSPs will be followed by a formal public comment period. Comment response documents, describing how specific public comments are to be responded to in next year's SSPs, will be developed and distributed by the field offices.

Moreover, SSP summaries will be prepared: one each for the eight field offices and one for the Feed Materials Production Center. SSP summaries will provide an overview of waste operations, environmental restoration, and technology development activities to Congress and the public. Each SSP summary will include the following sections: a description of major facilities and their missions; a discussion of the primary objectives of each program (Corrective

Activities, Waste Operations, Environmental Restoration, and Technology Development) and, where appropriate, a separate discussion of Transportation activities; a discussion of major accomplishments to date; an FY 1991-1992 funding summary table; and a list of major milestones.

The SSP format will continue to evolve as field office and Headquarters needs change. Future field office reviews will focus on establishing format requirements for the SSPs that will ensure appropriate consistency and quality control while allowing each field office to tailor its SSPs to meet specific regulator requirements and local public information needs. Efforts are continuing to identify EPA and DOE regulatory reporting and planning requirements that can be met through the SSPs. These include Waste Management Plans, groundwater reporting requirements, the Environmental Protection Implementation Plan, and reporting requirements of DOE Order 5820.2A (Radioactive Waste Management).

1.4.4.2 INCORPORATING TIGER TEAM ACTION PLANS INTO THE FIVE-YEAR PLAN

The EM Five-Year Plan is the mechanism for correcting many of the deficiencies raised in environmental Tiger Team reviews.

The Tiger Team initiative is the cornerstone of the Secretary's June 27, 1989, Ten-Point Plan to strengthen the safety, health, environmental protection, and waste management activities at DOE's production, research, and testing facilities. Since 1989, under the leadership of DOE's Office of Environment, Safety and Health (ES&H), Tiger Team assessments have been performed at 20 of the Department's major facilities. The Tiger Team assessments, along with other initiatives and directives, have set DOE on a new course of accountability and excellence in the area of environment, safety, and health. EM is taking aggressive steps to remedy deficiencies identified by Tiger Teams.

Major Findings: Although significant changes have been made in the way DOE conducts its business, the results from the first 16 Tiger Team assessments indicate that more work remains to be completed. There is evidence of improvement in some areas; however, environmental, safety, and health compliance and management problems persist throughout the complex. Key management, resource, and communication problems identified by the Tiger Teams include:

Management and Oversight of ES&H Activities: Tiger Teams found that ES&H authority is not well-defined and that the focus of responsibility for ES&H concerns is not understood across the Department and its installations.

Conduct of Operations/Formality and Discipline: Implementation of effective ES&H programs is hampered by the lack of sufficient formality and discipline in ES&H management systems.

Communication of ES&H Policy: The Department has not succeeded in communicating ES&H policy to all levels of DOE and contractor staff and eliminating the "business as usual" approach to compliance.

Resources/Training: Difficulties in recruiting and training sufficient numbers of qualified staff persist at many facilities.

The Tiger Teams also noted deficiencies in the areas of radiological protection, emergency preparedness, waste management, inactive waste sites, and environmental monitoring. Key RCRA/CERCLA/National Environmental Policy Act (NEPA) issues of particular concern to EM include:

- Storage of land disposal restricted wastes in violation of RCRA requirements,
- Inadequate waste identification and characterization,

- Inadequate waste storage and accumulation practices,
- Lack of monitoring waste storage activities,
- Failure to perform and complete inspections and conduct follow-up inspections,
- Failure to plan and conduct Remedial Investigation/Feasibility Study (RI/FS) work in accordance with National Contingency Plan guidelines and to keep programs on schedule,
- Difficulties in prioritizing and planning RI/FS programs,
- Deficient or nonexistent community relations plans, and
- Inadequate NEPA documentation.

EM Response: EM, in coordination with ES&H and the other Secretarial program offices, is taking steps to correct the aforementioned deficiencies. Findings relevant to EM are translated into site-specific planned actions, schedules, and costs for integration into the 5-year planning process.

The first step in this process is the preparation of an Action Plan by EM field offices in conjunction with the landlord of the facility (if EM is not the landlord). To date, 15 final Action Plans have been prepared. The Action Plan provides a formal written response to each of the findings cited in the Tiger Team Assessment Report. It also includes descriptions of the actions to be taken by the site to correct the finding, action schedules and milestones, associated costs, and programs responsible for the activities. The document also identifies actions and costs that are included (or planned for inclusion) in DOE's Five-Year Plan.

Actions planned in response to needs identified in Tiger Team assessments are compared to Activity Data Sheets (ADSs) to determine whether the needed actions are already under way or planned or whether current actions can be adapted to meet the identified needs. Tiger Team planned actions are then matched with the ADSs. In a table attached to each Action Plan, each EM-funded action is displayed and linked with one or more ADSs. A Tiger Team planned action can be included as part of one or more existing ADSs, or it can require the creation of one or more new ADSs. Each action is also assigned a priority consistent with the priorities used on ADSs. Moreover each ADS has a code that identifies the Tiger Team activity with which it is associated. In this Five-Year Plan, 772 ADSs are cross-linked with Tiger Team Action Plans.

Because EM conducts activities at every facility in DOE's Nuclear Weapons Complex, each action plan must pass through EM Headquarters for concurrence. It is the responsibility of the EM Quality Assurance Program Office to ensure that the actions are appropriate and the priorities assigned to them are consistent with the applicable Five-Year Plan. If Tiger Team recommendations result in the initiation of new activities in the current year not included in the current year's budget, then appropriate action will be taken in order to adjust funding among the programs.

1.4.4.3 PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT AND THE CONFIGURATION STUDY

Studies are under way that will provide the strategy for the configuration of the EM waste complex and the manner in which EM will conduct restoration activities.

The magnitude and complexity of the cleanup and waste management tasks that face DOE require systematic analysis of its program. This analysis is being accomplished through two related major efforts: the Programmatic Environmental Impact Statement (PEIS) and the Configuration Study. EM is coordinating its efforts closely with Defense Programs, which is currently studying the reconfiguration of the weapons complex (Figure 1.4.4.3).

Configuration Study: The goal of the EM Configuration Study is to develop and assess strategic alternatives for configuring the DOE complex to manage wastes. The planning horizon for the study is 30 years. Strategic options will be provided to the PEIS team for use in formulating alternatives for environmental analysis in the impact statement.

The study is assessing waste types, volumes, generation locations, and available facilities for managing the waste. Configuration alternatives are being developed for six major waste types:

- high-level radioactive waste,
- transuranic waste,
- low-level mixed waste,
- hazardous waste,
- environmental restoration waste, and
- sanitary waste.

The configuration options will be broad and cast in terms of whether the various wastes would best be managed (treated, stored, disposed) onsite or in a regional or central facility. In developing the options, consideration will be given to the degree to which waste minimization efforts, which include waste reduction at the source and recycling or recovery of useful materials, will change the projections of waste types and volumes that will require management.

Even though the PEIS will be completed 1 year before the completion of the Study, the Study will provide critical input to the EM PEIS. The various configuration alternatives defined in the Study will be assessed in the PEIS. This assessment will involve comparisons of the risks and environmental impacts of the alternatives, from which decisions can be made on the locations for new treatment, storage, and disposal facilities.

PEIS: The EM PEIS is being prepared in compliance with the National Environmental Policy Act requirements. A PEIS is a broad environmental analysis of a program or policy and is prepared when actions are connected and may have cumulative environmental impacts.

The EM PEIS will establish the Department's long-range policy for conducting program activities. The PEIS will assess the potential

environmental consequences of alternatives for implementing an integrated EM program. A number of issues will be addressed in the process of preparing the PEIS and the Record of Decision (ROD). These issues include risk to human health and the environment, future land use, cleanup levels, and the environmental basis for deciding cleanup priorities. The PEIS process will also address the degree to which DOE should rely on existing technologies or make resource commitments to developing innovative technologies. It will address the manner in which DOE should manage waste until adequate treatment and disposal capacity are available, how the waste management complex should be configured, and the transportation effects associated with different configurations of the waste management complex.

The PEIS Notice of Intent was published in the October 22, 1990, *Federal Register*. The comment period on the scope formally ended on February 19, 1991. Comments received after that date were incorporated into the record as practicable. The comments received during scoping, both those provided at the 23 scoping meetings as well as submitted for the record in writing, are being reviewed to help formulate or restate issues, concerns, and the alternatives for evaluation and analysis in the PEIS.

An Implementation Plan (IP) is being prepared that will identify the specific alternatives and the proposed action for the PEIS, as well as the information needed to perform the environmental assessment. Approval of the IP is expected by the end of FY 1991. The draft PEIS is estimated to be completed by the end of FY 1992, the final PEIS by the end of FY 1993, and the ROD by the end of calendar year 1993.

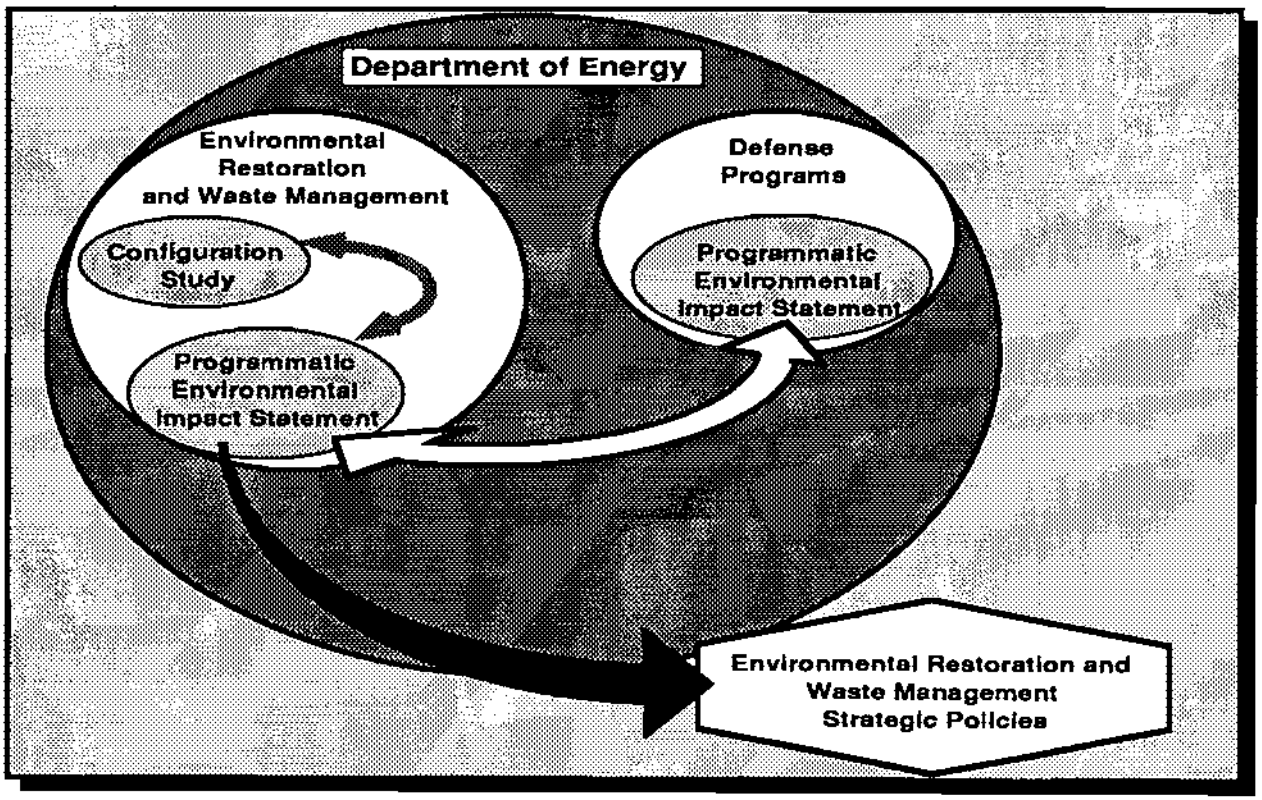


Figure 1.4.4.3. The Environmental Restoration Configuration Study and PEIS are related to the Defense Programs PEIS and are being closely coordinated. These documents will form the basis of the EM strategic policy of the future.

1.4.5 POTENTIAL IMPACTS OF LEGISLATIVE AND REGULATORY CHANGES ON CURRENT PLANNING

The number and complexity of Federal, State, and local laws affecting EM operations are steadily increasing, creating greater uncertainty. EM is carefully factoring potential regulatory changes into its planning.

Regulatory and legislative changes that will affect EM include the recent and upcoming reauthorization and amendment of major Federal environmental statutes, a growing number of implementing regulations, and increases in the number and complexity of State and local regulations. Planning is difficult because requirements for compliance are constantly changing and becoming more stringent and numerous. Specifically, these changes can affect EM planning in several ways. For example, sites not in compliance with new regulations must perform activities in addition to current plans to ensure full compliance. Unexpected corrective activities can require additional staff resources, new equipment, construction, or retrofitting of existing facilities, increasing the overall costs of compliance. Because the exact form of regulation is unknown, outyear planning is even more difficult. Furthermore, State-to-State inconsistency in regulation and Federal/State jurisdictional questions can introduce uncertainty into the planning process. To reduce the impact of regulatory uncertainty, EM works hard to incorporate the potential for regulatory change into its thinking about the future (Figure 1.4.5).

Recent Reauthorizations: Since the FY 1992-1996 Five-Year Plan was published, several major Federal environmental statutes have been reauthorized and amended. Those with the greatest potential to affect EM operations include the Clean Air Act (CAA) Amendments of 1990 and the reauthorization of the Hazardous Materials Transportation Act. Although these are not newly enacted statutes, the scope of the legislation has been significantly expanded, and major new programs have been introduced. Implementing regulations will be promulgated by the Federal agencies responsible for these statutes. As a result, DOE will face new changes in regulatory compliance.

EPA is currently developing CAA regulations that will have a major impact on the conduct of EM operations. The most significant changes for DOE will result from the expanded regulation of Hazardous Air Pollutants.

Upcoming Reauthorization: Several major environmental statutes are candidates for reauthorization during this session of Congress. Reauthorization will likely result in the expansion of programs and the promulgation of new regulations. Candidates for reauthorization include the Clean Water Act (CWA), RCRA, and possibly the Safe Drinking Water Act.

Reauthorization of RCRA will probably have a substantial impact on current planning efforts. Although it is impossible to forecast exact changes in RCRA and their impact on

EM's Five-Year Plan, many major issues have been fairly well identified. Some of these may facilitate EM's ability to achieve its goals and objectives, while others are likely to impose significant new regulatory requirements on DOE operations. Reauthorization of the CWA could also affect current planning efforts.

In addition to regulations being developed to implement the new provisions of the CAA amendments, EPA is developing a steady stream of other regulations. EPA's new regulatory initiatives include the development of a proposed rule that would revise corrective action under RCRA, promulgation of a storm water runoff rule, and proposed sewage sludge regulations under the CWA. A new Federal groundwater protection policy is expected to be finalized this year. Although some of these proposals will be substantially revised and not be implemented this year, they contribute to uncertainty for future years.

State and Local Regulation: State and local laws are increasing in number and complexity and may create inconsistencies with other State and local regulations. Uncertain areas of jurisdiction between State and Federal authorities may also arise. This increase in State and local involvement is in part the legacy of a conscious Federal strategy to delegate increasing regulatory powers to the States. Under certain statutes such as RCRA, States are encouraged to develop and enforce their own regulatory programs in accordance with Federal statutes.

Decentralization of regulatory authority and inconsistencies among State regulations can make planning difficult, lengthen timetables, and increase the costs for compliance. To address the problem of overlapping or conflicting State and Federal governmental authorities, DOE has pursued a strategy of developing Interagency Agreements with local, State, and other Federal agencies. These agreements have proven to be effective in reducing conflicts among regulatory agencies and have helped the Department achieve its twin goals of environmental regulatory compliance and cost-effective management.

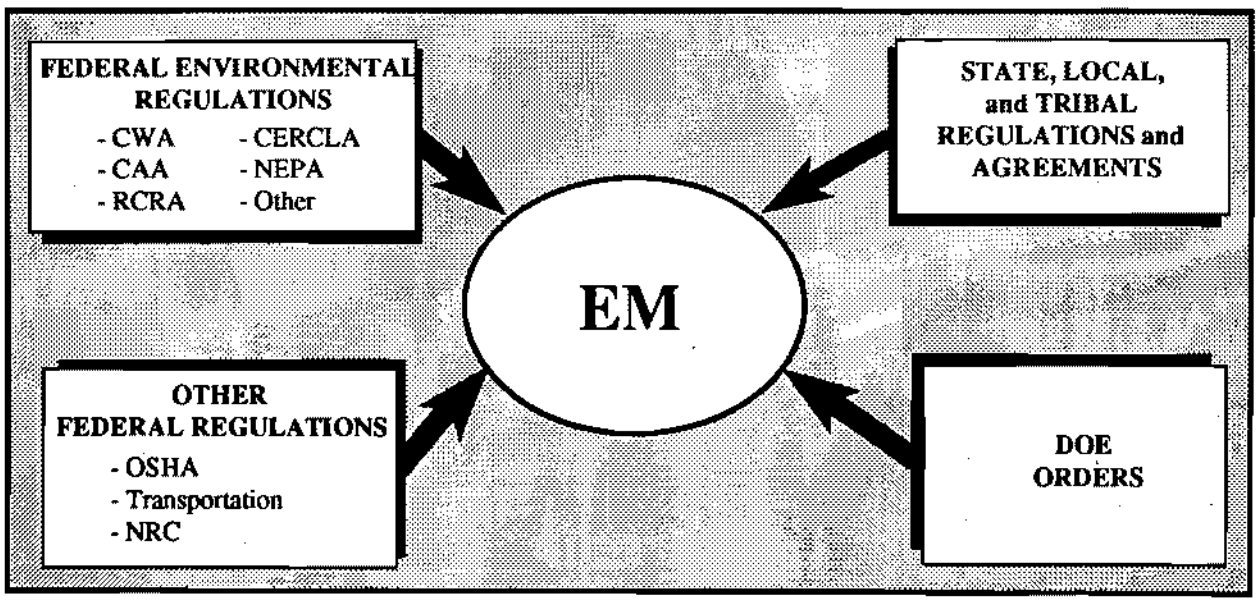


Figure 1.4.5. Achieving and maintaining full compliance with all applicable laws and regulations is the basis for EM activities. (OSHA = Occupational Safety and Health Act, NRC = Nuclear Regulatory Commission, NEPA = National Environmental Policy Act)

1.4.5.1 REAUTHORIZATION OF RCRA

Reauthorization of RCRA, which may occur during this session of Congress, will result in new and potentially stricter regulatory standards that may require activities that are not accounted for in current EM planning.

Congress may reauthorize RCRA as early as the present legislative session. Changes in RCRA could significantly impact EM. Though it is impossible to forecast exact changes to RCRA and its impact on any of EM's Five-Year Plans, three points are apparent:

- RCRA is the single most important statute affecting the Five-Year Plan and EM [EM estimates that it will spend a little over $2.0 billion for RCRA compliance in FY 1991 and $2.9 billion in FY 1992] (Figure 1.4.5.1); and
- Significant changes in RCRA may (and should) result from its reauthorization.

RCRA was enacted in 1976 as an amendment to the Solid Waste Disposal Act. The Act's primary objective is to protect public health and the environment through regulation of the management and disposal of solid and hazardous waste. RCRA was last amended in 1984 by the Hazardous and Solid Waste Amendments (HSWA), which imposed new, far-reaching, and prescriptive requirements on hazardous waste management.

Some of RCRA's most important features for EM's programs are:

- The "cradle to grave" management and tracking system for hazardous waste (from generator to transporter to treatment, storage, and disposal),
- Provisions for listing of materials as hazardous wastes,
- Corrective action requirements regulating the cleanup of contaminated sites at actively operating facilities,
- Land disposal restrictions (LDRs) prohibiting land disposal and storage of untreated hazardous wastes, and
- Minimum technology requirements for land disposal units.

The EPA identified major problems with the RCRA hazardous waste program in its July 1990 report, *The Nation's Hazardous Waste Management Program at a Crossroads: The RCRA Implementation Study*. Some of EPA's findings indicated that RCRA is plagued by too many "high" priorities, many of which are conflicting or unrealistic; criteria for prioritizing waste cleanup (corrective actions) are needed to address worst sites first and ensure consistency; emphasis must be placed on waste minimization; and development of innovative hazardous waste management and cleanup technologies need much greater encouragement. DOE did not fully recognize RCRA's jurisdiction over radioactive mixed waste (radioactive and hazardous) until 1987, well after the HSWA's implementing regulations were promulgated. In 1987, DOE clarified the

applicabilty of RCRA to radioactive mixed waste. Largely because of this earlier uncertainty, the radiological hazard of radioactive mixed waste was not factored into the treatment, storage, and disposal requirements created by RCRA and many of its implementing regulations for waste classified as hazardous.

RCRA compliance problems being faced by EM facilities include:

- Long-term storage of approximately 141.6 million gallons of LDR radioactive mixed waste due to the virtual absence of treatment technologies, a reason for storage that is not provided for under RCRA;
- Unacceptable occupational radiation exposures that can result from compliance with RCRA's waste management requirements; and
- The sheer magnitude of DOE's waste management and cleanup problems (approximately 1,000 treatment, storage, and disposal units and 3,700 contaminated sites), for which RCRA fails to establish prioritization criteria.

Potential issues that may impact DOE operations during RCRA reauthorization include:

- Requirements to reduce the use of toxics and the release of hazardous constituents into the environment;
- A program for recycling, including minimum recycling rates for recyclable commodities;
- Additional standards for solid waste management facilities;
- Management standards for used oil; and
- Interstate transport of solid and hazardous wastes.

EM is closely monitoring the RCRA reauthorization process in order to determine probable regulatory impacts and to effect planning and programmatic changes as needed.

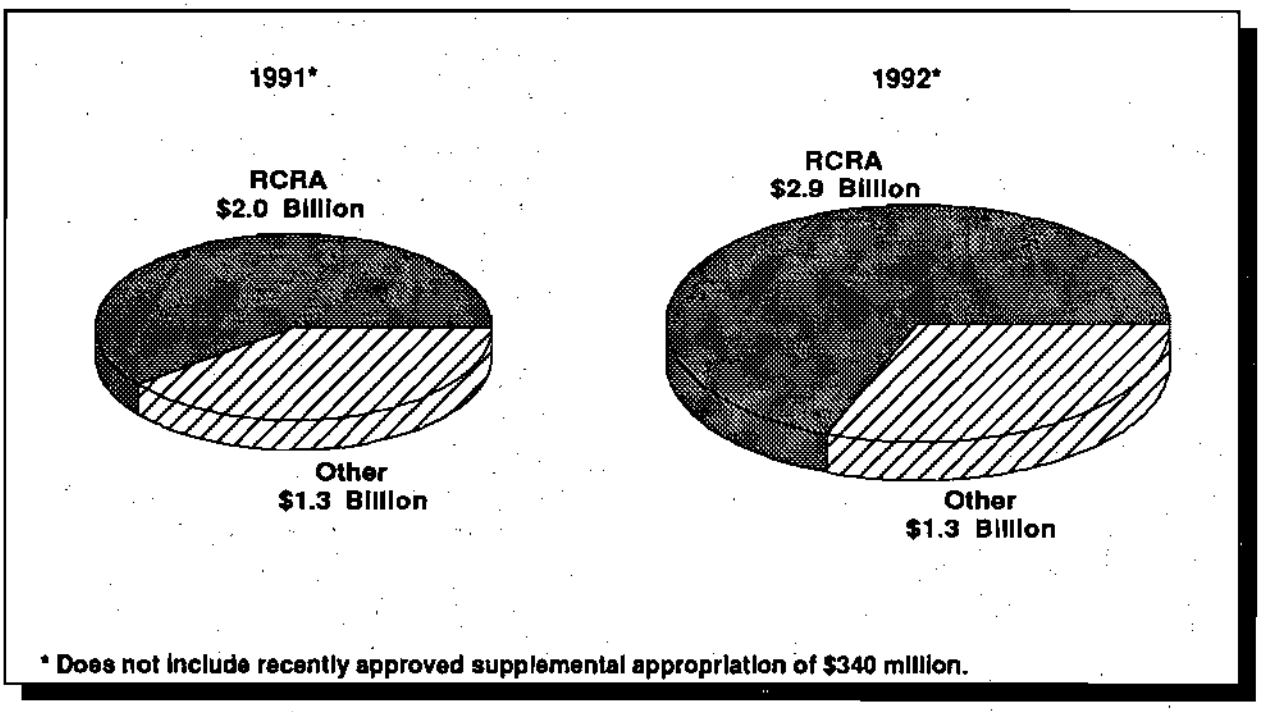
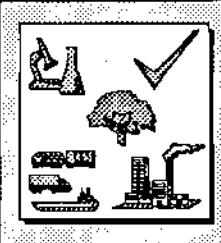


Figure 1.4.5.1. A substantial portion of the EM budget is dedicated to compliance with RCRA requirements.

1.4.5.2 REAUTHORIZATION OF THE CLEAN WATER ACT



Congress may reauthorize the Clean Water Act (CWA) during the present legislative session. Though it is impossible to forecast exact changes in the CWA and their impact, many of the key issues likely to receive consideration have been fairly well identified. Some of these may assist EM planning, while others may impose significant new regulatory requirements.

The CWA regulates the quality of the Nation's surface waters. It accomplishes this through several programs, including:

- The National Pollutant Discharge Elimination System, which translates water quality standards and effluent guidelines into pollutant limits allowable for discharges directly into surface waters;
- Requirements for pretreatment of discharges into municipal sewer systems; and
- Local nonpoint source pollution planning.

The CWA also protects wetlands by requiring that a party seeking to discharge into, dredge, or fill a wetland first acquire a permit under Section 404 of the CWA and follow strict regulatory procedures designed to prevent wetlands destruction where possible.

Congress last amended the CWA in 1987. The 1987 amendments accelerated the control of toxic discharges, defined new State responsibilities for nonpoint sources of pollution, increased attention to be given to estuaries and lakes, and provided for a phaseout of the Federal Construction Grants Program for Municipal Sewer Systems, replacing it with a revolving loan program.

The CWA has made an enormous contribution to restoring the quality of the Nations' waters, particularly over the past 20 years. Over $75 billion has been spent by Federal, State, and local governments for construction of municipal sewage treatment facilities. Effluent discharge categories have been established for industrial dischargers, reducing pollutant discharges by 90 percent according to recent EPA statements. Ocean dumping of industrial wastes has stopped, while ocean dumping of municipal sewage has nearly ceased. Approximately 75 percent of the Nation's surface waters now meet statutory water quality standards.

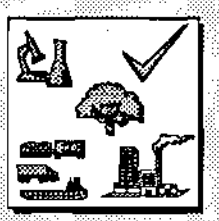
<u>Issues that EM believes may be addressed during CWA Reauthorization include</u>:

- Adequacy of water quality standards (toxic limitations, use of biocriteria and sediment analyses for permitting discharges),
- Means to achieve pollution prevention objectives (technology bans, requiring zero discharge of certain pollutants),
- Additional protection for wetlands,
- More comprehensive programs for nonpoint source pollution (potentially including enforceable measures),
- Inclusion of groundwaters under the definition of waters of the United States,
- Revisions to antibacksliding requirements,

- Requirements for facility upgrades to eliminate combined sewer overflows,
- Development of a cross-media permitting program, and
- Regulation of aboveground tanks.

It is likely that congressional action on these issues will add significant new regulatory responsibilities to the EM program. To be poised to respond quickly to requirements of a reauthorized CWA, EM is following legislative developments carefully and attempting to factor uncertainty into its planning processes.

1.4.5.3 THE CLEAN AIR ACT AMENDMENTS



On November 15, 1990, President Bush signed the Clean Air Act (CAA) Amendments into law. These will result in an increase in regulatory requirements for DOE operating facilities. The most significant changes for DOE will result from the expanded regulation of hazardous air pollutants (HAPs).

On November 15, 1990, President Bush signed sweeping revisions of the CAA into law. These amendments, which are designed to sharply reduce air pollution by early in the next century, impose new and costly technological requirements or health standards on virtually every industrial sector in the hope of restoring the atmosphere's protective ozone shield and attacking urban smog, acid rain, and cancer-causing industrial emissions.

The major features of the CAA Amendments are (1) greatly strengthening the measures for the attainment of air quality standards, (2) establishing tighter standards for motor vehicles and fuels, (3) requiring substantial reductions in power plant emissions for the control of acid rain, (4) establishing a new program of operating permits for all major sources of air pollution, and (5) greatly expanding the regulation of HAPs.

The CAA Amendments will have far-reaching effects on DOE facilities, compliance, procurement and maintenance activities, and motor vehicle operations. An accurate understanding of these impacts will not be possible until EPA proposes regulations to implement the requirements of the CAA Amendments. EPA is required to issue new regulations under the CAA Amendments by specific dates. One hundred five EPA rule makings are required within 2 years. The CAA Amendments will require States to develop EPA-approved comprehensive operating permit plans, resulting in a Federally mandated permit requirement for many air pollution sources currently possessing only a State permit or no permit at all. Also, many of the air pollution sources that emit less than 100 tons per year (not currently covered by permit) will become subject to the full regimen of permitting, monitoring, and reporting requirements. In response to these new requirements, DOE will reevaluate its use of chemicals, measure the HAPs in the emissions of its facilities (including RCRA and publicly owned treatment works), and investigate the potential for minimization of use and substitution of those chemicals.

Under the Amendments, almost all significant sources of air pollution will be subject to the new operating permit program. In general, each permit issued under the new program will contain enforceable emission limitations, compliance schedules, and requirements for inspection, entry, monitoring, compliance certification, and reporting. The new permit requirements may increase costs and administrative demands on DOE and DOE contractors.

Effect on DOE: The most significant effect that the CAA Amendments will have on DOE involves HAPs. Section 112(a)(1) of the Clean Air Act calls for a study of HAP emissions from electric utilities within 4 years

of enactment. Congress greatly expanded the number of HAPs from 8 to 189. During the next 9 years, EPA is required to issue emission standards for each HAP source category (Figure 1.4.5.3). There is also a major shift in the regulation of HAPs from using health-based chemical-specific standards to technology-based standards applicable to HAP emission sources rather than to the HAPs themselves.

Since March 15, 1990, new radionuclide air emission standards have been in effect. The rule establishes a dose standard for DOE facilities from radionuclides other than radon of less that 10 mrem/year to the general public. The doses are to be calculated using emissions based on stack monitoring procedures and modeling specified in the EPA-approved rule or alternatives.

Although the CAA Amendments do not specifically change the EPA emission standard for radionuclides, the "residual risk" provisions of the Amendments require EPA to base its emission standards on a health risk level that is 1 percent of the level on which the present emission standard is based. EPA must, therefore, reexamine and perhaps revise the emission standard for radionuclides. This may result in new requirements for DOE facilities.

In June 1990, as the first part of a multiphased regulatory effort that will control air emissions at new and existing hazardous waste treatment, storage, and disposal (TSD) facilities, EPA issued air standards for organic chemical emissions from process vents and equipment leaks. DOE's TSD facilities fall under EM. The rule will affect DOE contractors who dispose of RCRA wastes. The next phase of this effort will consist of air standards for organic chemical emissions from surface impoundments, tanks, containers, and miscellaneous units.

Other potential impacts on EM include the potential for Environmental Restoration site operations (air stripping, fugitive dust, etc.) to be designated as a HAP source category, and because EPA is directed to establish a separate HAP source category and emission standards for research or laboratory facilities, the Amendments are potentially extremely important to EM research. Finally, the CAA also requires evaluation of ozone-depleting substances, including chlorofluorocarbons, carbon tetrachloride, and methyl chloroform for performance within existing equipment. Equipment upgrade or replacement may result. Facilities with coal-fired boilers may require costly upgrades or replacement in order to comply with the acid rain provisions of the Amendments.

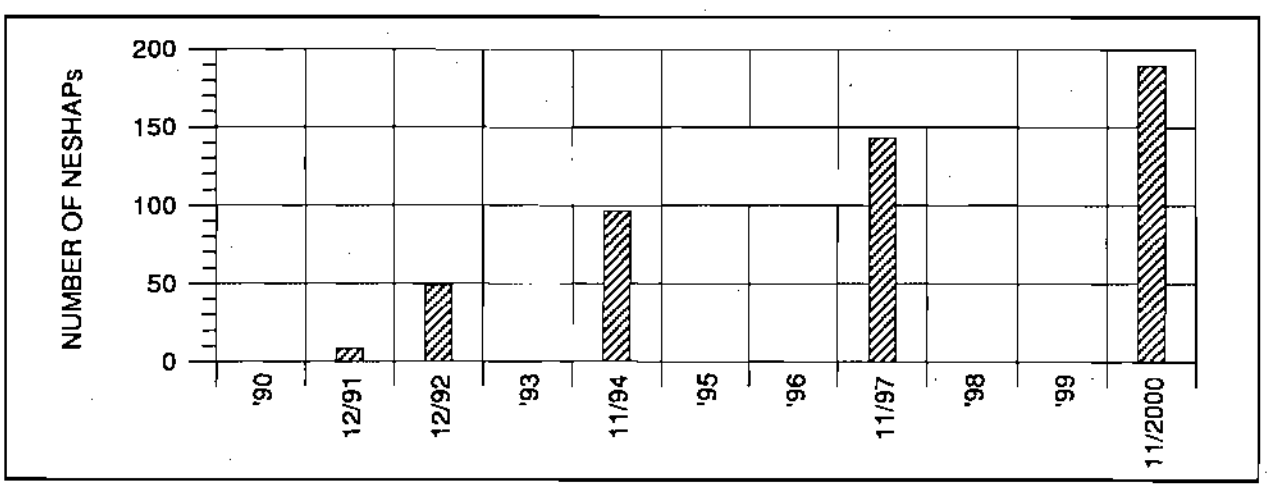
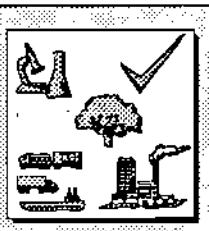


Figure 1.4.5.3. The number of hazardous source standards issued by EPA will increase to a total of 189 by the year 2000. (NESHAPs = National Emission Standards for Hazardous Air Pollutants)

1.4.5.4 IMPACT OF REGULATORY CHANGES CONCERNING NATURAL RESOURCE DAMAGES



Because of the expansion of the scope of potential natural resource damage awards resulting from the case, Ohio vs the Department of the Interior, there is an increased likelihood of a greater number of such claims.

The Damages Issue: Section 107 of CERCLA provides that damages may be assessed when natural resources (land, fish, wildlife, biota, air, water, groundwater, drinking water supplies, and other such resources) are injured by releases of hazardous substances. In addition to other costs or damages, Natural Resource Trustees may file a claim for "residual" damages, seeking compensation for injuries that are not or cannot be addressed by environmental response actions. Residual damage awards represent potential costs, which are *in addition* to the cost of cleaning up existing contamination under Section 120 of the Superfund Amendments and Reauthorization Act. Federal agencies responsible for releases and damages must also pay these additional costs (Figure 1.4.5.4).

It is possible that a trustee (Federal agency, State, or Indian Tribe) may present claims for damages to DOE or its operating contractors. Portions of the Natural Resource Damage Assessment (NRDA) rule, challenged by State trustees, are being rewritten to conform to a 1989 ruling by a Federal Appeals Court *[State of Ohio v. Department of the Interior 880 F.2d 432 (D.C. Cir. 1989)]*. The D.C. Circuit held that the measure of damages is the cost of restoration, rehabilitation, replacement, and/or acquisition of equivalent resources, and compensable values. The latter includes the lost value of services directly or indirectly provided by the resource prior to its injury and is assessed over the course of the injury and recovery periods.

The courts struck down the original regulations measure of CERCLA natural resource damages, which limited damages to the *lesser* of restoration cost or lost use value. The court thereby significantly expanded the scope of recoverable damages, because restoration costs often exceed lost use values. The court also directed that trustees be allowed to use nonmarket-based methodologies to value resource services. Potentially higher "existence values" of certain resources can therefore replace lower, market-based evaluations in damage assessments, particularly when no vigorous markets exist to value the resources in question.

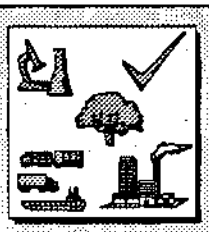
Relatively few CERCLA natural resource damage claims were filed by trustees prior to *State of Ohio v. Department of the Interior*. With the expansion of the scope of potential damage awards afforded by *State of Ohio v. Department of the Interior*, there is now an increased likelihood of a greater number of costly natural resource damage claims. Where there are significant residual damages, natural resource claims could, in extreme cases, exceed the cost of cleaning up the existing contamination. For example, at one New England Superfund site,

valuable fisheries resources were injured. After a settlement had been reached, which did not account for these injuries, EPA and the responsible party had to amend their agreement to include restorative actions. Settlement costs grew from $2 million to $66 million. In order to avoid this kind of uncontrolled cost growth, DOE is developing a strategy (outlined below) that incorporates existing CERCLA requirements with early actions to assess and, as appropriate, restore or replace injured natural resources.

DOE's Strategy: DOE functions in multiple roles, including trustee and the lead response agency. For example, as a lead response agency, DOE must conduct an ecological assessment that focuses on the impact of hazardous substance releases on biota (other than man) and ecosystems. The CERCLA ecological assessments can be combined with an NRDA to fashion an integrated approach that can facilitate remedial action and identify potential residual injuries to natural resources. If natural resource injuries and residual damages are identified or can be estimated during the investigatory phase of an environmental restoration project, then DOE can use the information to plan mitigation measures for the remedial phase. This planning should help to reduce what would otherwise be "residual" damage. Even if the mitigation measures cannot eliminate all residual damages, they may be sufficiently reduced to satisfy the concerns of cotrustees.

DOE's ultimate goal is to work with other trustees to devise remedies that incorporate early appropriate resource restoration plans, while at the same time avoiding costly and time-consuming litigation.

1.4.6.1 MANAGING COST GROWTH: CHANGES IN COST ESTIMATING/ VALIDATION FOR THE FIVE-YEAR PLAN



The EM costing guidance, including self-assessment activities, ensures improved quality of cost estimates.

Although in the early stages of developing cost and schedule estimating systems for the evolving environmental programs, EM has taken actions to improve its ability to estimate the costs and schedules of its efforts.

Guidance for preparing and validating cost estimates for this Five-Year Plan was issued to EM's line programs (Environmental Restoration, Waste Operations, and Technology Development) and field offices. This guidance emphasized the importance of realistic cost estimates as the basis for defensible budgets and sound project execution and control. It was issued as part of the guidance for developing the funding estimates for this Five-Year Plan.

The responsibilities for implementing the cost validation process rests with EM line programs, with oversight responsibilities resting with the Division of Engineering and Cost Evaluation in EM's Office of Quality Assurance and Quality Control (QA/QC). The line organizations will perform independent cost reviews of selected projects. Performing cost estimating process reviews and audits is the responsibility of QA/QC. These tasks, taken together, help determine the realism, completeness, and consistency of cost projections.

Cost estimates must be adequately documented. Documentation is critical for managers as well as estimators to trace the scope, schedule, ground rules, and assumptions of a project's evolution. The guidance sets out minimum documentation requirements for cost estimating.

Guidance was also given to the line programs for conducting their independent cost reviews. The guidance covered categories of work to be reviewed, project selection criteria, a definition of "independent," efficiency/effectiveness, cost benefit analysis requirements, and reconciliation and documentation requirements. The implementing procedures for the line programs are discussed in Section 2 and in Section 1.4.6.4.

QA/QC is responsible for the completion of the internal validation process. Cost estimating process reviews and audits will address the following functional areas:

- cost and schedule estimating processes,
- technical and design decision process,
- indirect analyses,
- historical data availability,
- management systems as related to cost control, and

- adequacy/existence of cost related policy and guidelines.

In addition, independent check estimates will be performed on a sample basis for each EM programmatic area. This activity will provide the basis for assessing the line organizations' response to the Five-Year Plan guidelines. The validation process is planned to be completed by the end of the 1991 calendar year.

1.4.6.2 MANAGING COST GROWTH: FOCUSING ON MOST IMPORTANT CONCERNS

Though the missions of the EM program offices entail different ways of setting priorities, the net result focuses EM resources on fixing what must and can be fixed now and preventing what cannot be fixed now from getting worse.

The Federal deficit problem is neither new nor likely to be resolved for many years. EM must prioritize and allocate its resources carefully. In previous Five-Year Plans, EM has used as an interim measure the following four priority levels.

Priority 1: Priority 1 includes activities necessary to prevent near-term adverse impacts on workers, the public, or the environment. Examples include containment to prevent the spread of contamination, actions to prevent or minimize releases to the environment, and ongoing waste operations activities required to maintain safe conditions. Also included as Priority 1 are ongoing activities that, if terminated, could result in significant program and/or resource impacts. Impacts could include significantly increased risk to the environment or to workers and significantly increased costs.

Priority 2: Priority 2 items encompass those activities required to meet the terms of agreements (in place or in negotiation) between DOE and Tribal governments and local, State, and Federal agencies. These agreements represent legal or, in the case of Agreements-in Principle, procedural commitments to complete activities on the schedules agreed to by DOE. A major goal in this Plan is to document DOE's commitment to complying with these agreements.

Priority 3: Priority 3 includes activities required for compliance with external environmental regulations that were not covered by Priorities 1 or 2. Other actions included in Priority 3 are compliance with DOE Orders that implement external regulations or that set specific DOE regulatory standards, actions that would reduce risk or costs, and actions that would prevent disruption of DOE's production mission.

Priority 4: Priority 4 includes activities that are not required by regulation but that would be desirable. Examples of Priority 4 actions include complying with DOE Orders that are more stringent than external regulations, implementing improved management practices, reducing personnel exposures below levels required by regulations or standards, and accelerating actions to satisfy agreements or milestones ahead of schedule.

The EM line programs (Environmental Restoration, Waste Operations, and Technology Development) have been developing prioritization systems, specific to their programs, that are consistent with the underlying principles of the EM priority levels just described. Each of the line program prioritization systems allocates resources fundamentally in the same way, with highest risk situations as the top priority.

Each line program's prioritization system is discussed in Section 2.

As noted in Section 1.2.4.1, two funding cases were prepared. The Validated Target Level (VTL) provides a 10 percent annual increase for the defense-related EM program. The program grows at 10 percent per year even in the context of declining statutory caps for the overall defense category which were insisted upon by Congress. The Preliminary Unvalidated Case (PUC) represents a preliminary estimate of funding: to ensure protection of the public and worker health and safety, to carry out the agreements entered into DOE, to ensure compliance with applicable environmental requirements, and to implement other desired improvements.

The funding estimates for these two cases are presented in Tables 1.4.6.2.a and 1.4.6.2.b for FY 1991-1997 for each of the four priority categories. A comparison of the two funding cases illustrates the workings of the EM prioritization system. In the VTL, priority 1 activities would be funded at the largest percentage of the PUC. Priority 4 activities would receive the lowest percentage of the field-office requested funding.

Those Priority 4 EM activities that continue to be funded at the Validated Target Level are (1) mandated landlord (i.e., housekeeping) responsibilities and (2) projects in which there have already been significant financial investments, and, therefore, the most cost effective approach is to bring the projects to completion. Priority 4 activities comprise less than 1/2 percent ($9 million) of the $4.9 billion estimated for FY 1993 under the VTL.

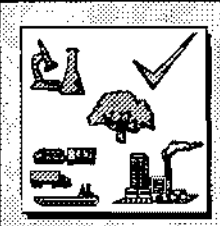
Preliminary Unvalidated Case-Total Dollars (Billions)								
PRIORITY		1991	1992	1993	1994	1995	1996	1997
1	SUBTOTAL	2.85	3.19	4.83	5.24	5.32	5.30	5.05
2	SUBTOTAL	0.53	0.74	1.36	1.62	2.00	2.20	2.23
3	SUBTOTAL	0.30	0.43	0.71	0.99	1.23	1.19	1.05
4	SUBTOTAL	0.006	0.011	0.026	0.057	0.097	0.11	0.056
	GRAND TOTALS	3.7	4.4	6.9	7.9	8.7	8.8	8.4

Table 1.4.6.2a. Funding for the PUC heavily emphasizes Priority 1 activities.

Validated Target Level - Total Dollars (Billions)								
PRIORITY		1991	1992	1993	1994	1995	1996	1997
1	SUBTOTAL	2.85	3.19	3.53	3.84	3.82	4.06	4.47
2	SUBTOTAL	0.53	0.74	0.89	1.02	1.15	1.30	1.37
3	SUBTOTAL	0.30	0.43	0.46	0.62	0.71	0.76	0.84
4	SUBTOTAL	0.006	0.011	0.009	0.016	0.026	0.032	0.019
	GRAND TOTALS	3.7	4.4	4.9	5.3	5.7	6.2	6.7

Table 1.4.6.2b. Funding for the VTL also heavily emphasizes Priority 1 activities.

1.4.6.3 MANAGING COST GROWTH: FINDING CHEAPER WAYS TO GET IT DONE



Technology advances offer the only option for bringing the cost of environmental restoration and waste operations within a reasonable range while maintaining safety and managing risks.

DOE has embarked on an aggressive program to improve operating practices within its facilities and to restore the sites to regulatory standards within 30 years. Cost estimates vary. Among the benefits of Technology Development (TD) is the ability to lower overall cost of the EM Program. Current remedial technologies involving excavation, treatment, and redisposal of contaminated soil and pumping and treatment of groundwater are either technically inadequate or too costly. Field demonstrations of innovative in situ soil treatment technologies are expected to lower costs of soil treatment.

Two types of benefits are associated with TD: direct cost savings and cost avoidance savings. Direct cost savings accrue from using innovative technologies to replace existing technologies. Cost avoidance savings result from reductions in use or elimination of other activities. Most benefits, monetary and nonmonetary, will be long term as new developments are tested in laboratory and pilot-scale experiments and demonstrated under realistic field conditions. Preliminary assessments indicate that TD will result in major savings. The investment in TD to date is already paying off in terms of cost savings to the EM program.

Through the execution of Integrated Programs and Integrated Demonstrations (IDs) described in Section 2.4, savings have already been achieved. For example, in the Cleanup of Volatile Organic Compounds in Saturated Soils and Groundwater ID, multiple technologies have been demonstrated. The ID approach requires only one set of permits, one site characterization, and one environmental model, and a single postclosure monitoring network. Resultant savings are estimated at $72 million. In addition, the application of horizontal well/air stripping technology has been three times more effective than conventional pump and treat methods. It avoids water disposal costs. Return-on-investment for the Research, Development, Demonstration, Testing, and Evaluation (RDDT&E) lies between 25 and 60 to 1. Overall savings of $125 million are estimated.

<u>Oak Ridge Y-12 Plant Low-Level Wastes</u>: Process wastewater treatment facilities at the Y-12 Plant, like those at most industrial sites, generate large volumes of hazardous or mixed waste sludges. Drums of Y-12 wastewater treatment sludge are stored at the Oak Ridge K-25 Site and the Y-12 West End Tank Farm. TD pursuits include proof-of-principle laboratory-scale investigations to develop permanent waste forms and immobilization technology for these residues. Preliminary estimates indicate a potential reduction of $57 million per year in storage costs (Figure 1.4.6.3).

Reusable High-Efficiency Particulate Air (HEPA) Filters: HEPA filters currently used by DOE and other facilities use glass fiber media and are neither cleanable nor reusable. In addition, they fail at high temperatures and in moisture and overpressure. TD has developed high-efficiency filters made from stainless steel fibers that overcome these deficiencies. This innovation, if successful, will reduce both the volume of waste produced and the cost of HEPA filtration. Comparative estimates show current HEPA filtration costs of $122 million and Phase IV HEPA filtration costs at $24 million. Net savings of $98 million/year are likely.

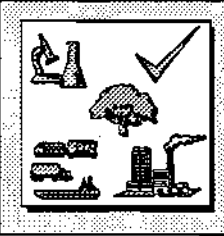
Innovative Instrumentation: Standard laboratory practices are currently used to analyze field samples. Estimated cost for analysis of RCRA components in a water sample is $1300 and $1600 for a solid sample. New field-deployable, real-time instruments are being developed to analyze waste components in the field. Examples of advanced techniques include fiber optics, laser-induced spectroscopy, and ion trap mass spectroscopy. Anticipated application costs for the new methods are 10 percent of current methods. Projections are that a $10 million RDDT&E investment, applied to 300,000 samples, will yield an annual savings of $200 million.

Laboratory Automation: In FY 1989, over 400,000 environmental samples were analyzed by or for DOE. This number will increase by four- to tenfold in the next decade. Many analyses will involve mixed radioactive and hazardous materials that require special handling. In anticipation of this sample load, the Office of Technology Development is developing more automated laboratory technologies. These technologies will yield faster and more accurate results and are estimated to ultimately generate savings of $350 million/year.

FY 1990 Budget	$183.5 million	
Projected Cost Savings Through Technology Development	**1-Year Projected Savings (in millions of dollars)**	**10-Year Savings (in billions of dollars)**
• Reduction of low-level waste volume at Y-12 Plant	$ 57M	$0.57B
• Supercritical water oxidation: destroys RCRA components in mixed waste	$33M	$0.33B
• Reusable HEPA filters:	$98M	$0.98B
• Innovative instrumentation: real time, in situ monitoring and analysis	$200M	$2.00B
• Automated analytical laboratories: 300,000 environmental samples per year	$350M	$3.50B

Figure 1.4.6.3. Technology Development more than paid for itself in FY 1990, with greater returns expected in future years.

1.4.6.4 NEAR-TERM INITIATIVES BY ENVIRONMENTAL RESTORATION, WASTE OPERATIONS, AND TECHNOLOGY DEVELOPMENT TO IMPROVE AND REDUCE COST AND SCHEDULE ESTIMATES



Environmental Restoration, Waste Operations, and Technology Development have implemented over 15 initiatives to improve the accuracy of cost and schedule estimates and to reduce the unit cost of environmental restoration and waste management activities.

Cost overruns and schedule slippages traditionally have plagued environmental management programs in both the public and private sectors. While DOE's environmental management programs are relatively new, a number of steps are being taken to minimize cost and schedule overruns in them. The Office of Waste Operations and the Office of Environmental Restoration, in close cooperation with the Office of Technology Development, have implemented over 15 initiatives to address cost and schedule issues (Figure 1.4.6.4). The program revolves around three principal themes: (1) reducing the unit cost of waste operations and environmental restoration activities, (2) improving cost and schedule baselines, and (3) establishing effective program and project management systems.

The first set of initiatives addresses the heart of the cost and schedule issue by identifying means for reducing the cost and time required to do work in the EM Program. These initiatives focus primarily on the interface between technology development and the field environmental management activities. In addition, several studies will be completed over the next year that examine other factors that can result in reduction in costs. One of these studies will examine DOE program infrastructure to measure its capacity to absorb the large scope of EM work. Another study will evaluate means for accelerating the learning process in implementing new environmental technologies.

The second set of initiatives, and by far the largest, surrounds the improvement in the current cost and schedule estimates for EM field activities. This multifaceted effort includes the development of cost and schedule estimating guidelines, field training seminars on cost and schedule estimating, the development of unit cost libraries, and research on the drivers of cost and schedule uncertainties in environmental restoration projects.

To establish a baseline for these cost and schedule initiatives, the Waste Operations and Environmental Restoration Programs conducted cost and schedule reviews of the FY 1993 Activity Data Sheets (ADSs). These reviews were designed to improve DOE Headquarters' understanding of the ADS cost and schedule estimating process and to review the traceability and consistency of the cost estimates. Review teams led by DOE Headquarters personnel and accompanied by trained cost estimators visited all of the major DOE installations in January and February 1991. The results of these field visits were summarized in a report that was jointly reviewed by the Headquarters organization as well as by field personnel.

The final set of initiatives involves the implementation of effective program and project management systems. These projects can be grouped into three categories: (1) development of program management guidelines and procedures; (2) implementation of systems for prioritizing activities and for managing the cost, schedule, and technical baselines; and (3) establishment of a system for tracking and evaluating EM program accomplishments. Over the past year, many of these systems have been put into place. Consequently, DOE has experienced significant gains in its ability to manage and control EM activities.

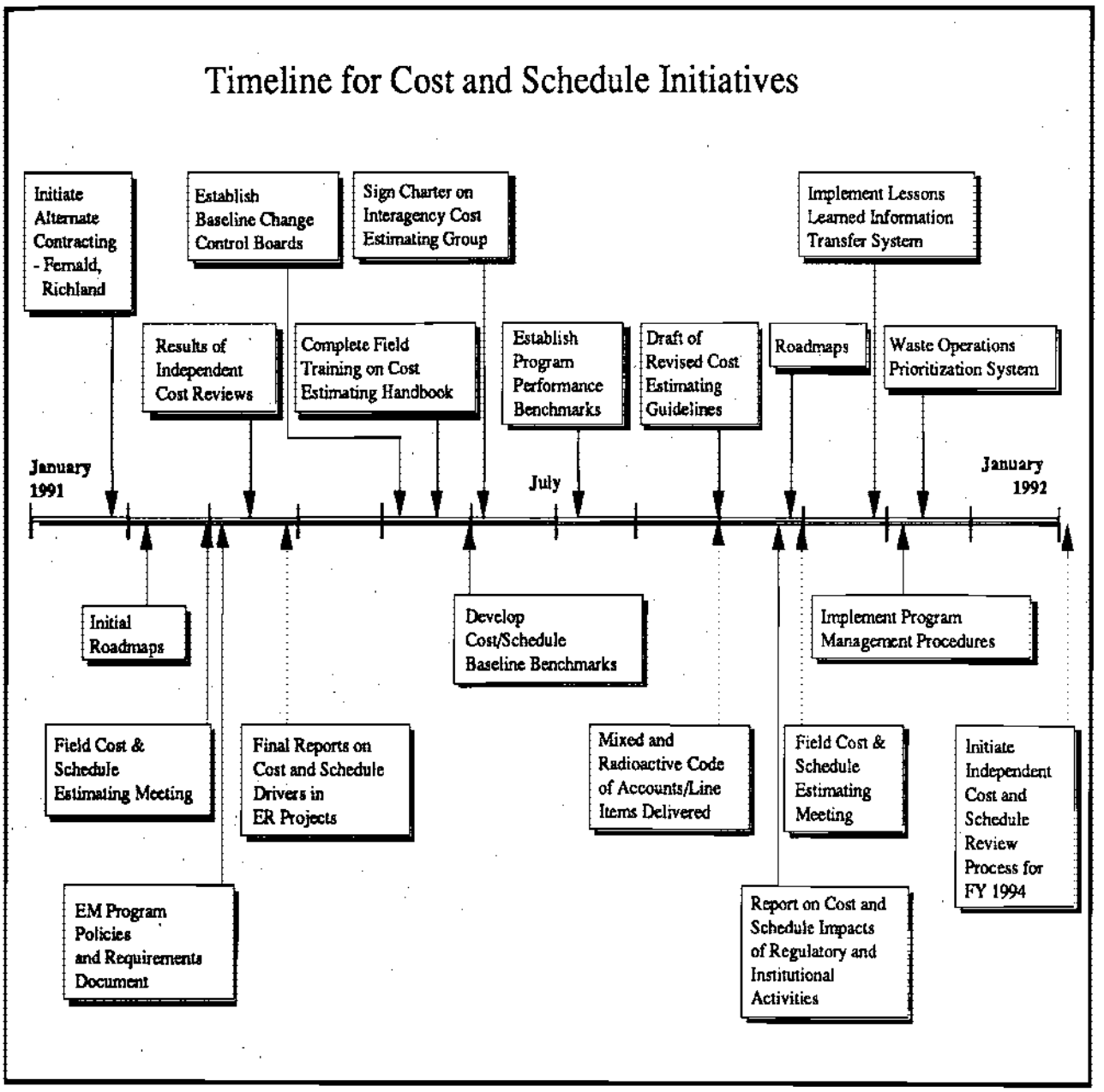


Figure 1.4.6.4. The Offices of Waste Operations and Environmental Restoration, in close cooperation with the Office of Technology Development, have implemented over 15 initiatives to address cost and schedule issues.

1.4.7 ROADMAPS: WHAT AND WHY

Roadmapping is the process that will show what EM needs to do to achieve its 30-year goals.

What are Roadmaps and Why do Them? Roadmaps are top-level tools that aid EM in making the "right" decisions. Drawing upon advanced strategic planning tools used in the private sector, roadmaps provide EM with a uniform method for developing, evaluating, and correcting plans. Roadmaps describe the activities to be done and issues to be resolved to achieve long-term goals and objectives. They are developed to determine how to get from "where we are" to "where we want to be." Roadmaps are not a single-sheet document resembling a highway map. Instead, they are a set of products documenting the outcome of each of the three phases of the roadmap process: assessment, analysis, and issue resolution. The process identifies the roadblocks that impede progress and aids in eliminating them.

Roadmaps also identify the basis for technology needs, financial and human resource requirements, and other crosscutting issues. Roadmapping allows for integration between otherwise separately scheduled projects and programs so that complexwide regulatory and organizational issues can be addressed. This unique characteristic ensures that the effects of changes to any program can be examined with respect to other related programs, present or future. Once the issues requiring resolution are identified, issue resolution can be done at many levels. Thus decision makers can focus on the most relevant and important issues, with the supporting documentation to appropriately resolve them.

How are Roadmaps Developed? Roadmaps are first developed at the installation level through a uniform process of assessment, analysis, and issue resolution (Figure 1.4.7a). The installation assesses its committed milestones and requirements and the current plans to achieve them. Roadmaps follow the logic for each waste stream or remedial action, ending in disposal and/or cleanup. Roadmaps then identify issues that might impede progress and analyze them to determine causes. Finally, the installation develops solutions to problems that the roadmap has identified. The documentation ranges from detailed site-oriented logic diagrams showing the principal steps for achieving compliance and/or remediation to Headquarters-issued documents used to communicate high-level and crosscutting issues to other parts of the EM organization. Issues and needs that cannot be addressed at the field office-level are raised to Headquarters. Complexwide issues or needs form a basis for planning national programs such as technology development or transportation.

Issues specific to waste types (i.e., transuranic waste or high-level waste) can be examined across the complex, providing a national perspective for waste stream management.

Where Are We So Far? DOE's need for a diagnostic tool like roadmaps was identified soon after the formation of EM. Roadmaps were first envisioned to identify the nature and timing of technology development needs. A cross-disciplinary team was formed in April 1990 to develop the details for that process. The developers soon realized that technology development was only one of a number of applications that could be well served by the institutionalization of the roadmap methodology.

By the beginning of FY 1991, the roadmap methodology had been sufficiently developed for more widespread use. EM chose four important sites and programs and requested initial roadmaps in preparation of this Five-Year Plan (Sections 1.4.7.1–1.4.7.4). These have been completed, and we are now preparing for the next step.

Where We Are Going? EM's goal is to roadmap all of its programs to provide for comprehensive and systematic issue identification and resolution planning. During the next 18 months, roadmaps will be developed on EM-wide basis (Figure 1.4.7b). The objectives of the next year are to expand the roadmap process to more installations and begin integrating installation-level roadmaps on a national basis. The first installations chosen for expansion will include those that generate or store low-level/mixed waste from either waste operations or environmental restoration activities. Other environmental restoration efforts will also be roadmapped. Completion of these roadmaps will be phased throughout 1992.

Based on these results, a comprehensive national roadmap will be conducted in FY 1992 for low-level/mixed waste. A transportation roadmap is also planned to assess the readiness of the transportation program to meet the needs and challenges stemming from remediation and compliance activities.

Work at Headquarters throughout the year will focus on issue resolution. In future years, national roadmaps will be done for other waste types, such as transuranic waste. These expanded roadmapping activities will provide EM with an increasingly issue-oriented planning process to ensure that roadblocks to meeting the 30-year goals are quickly identified and resolved.

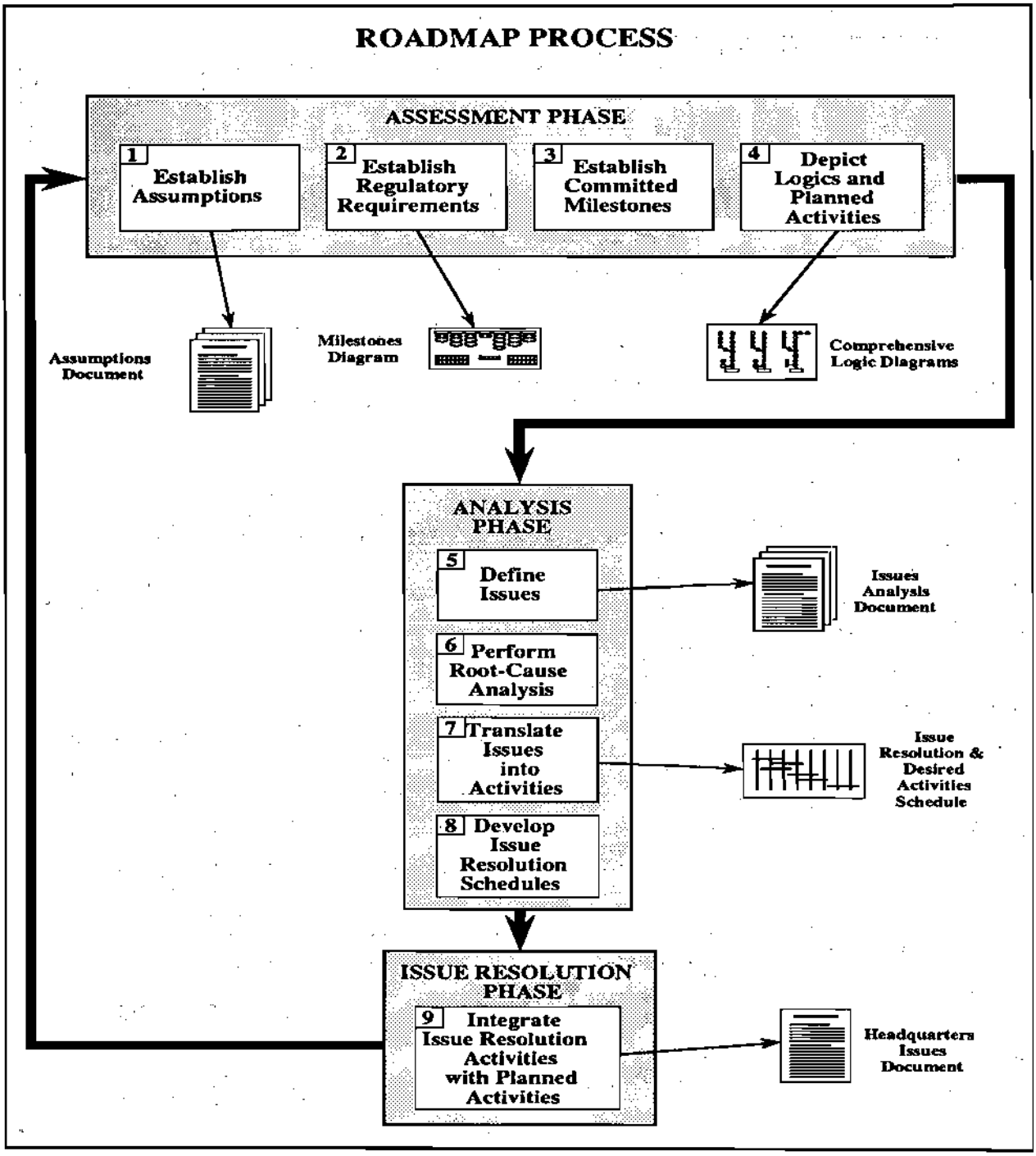


Figure 1.4.7a. Roadmap Methodology Phases and Products.

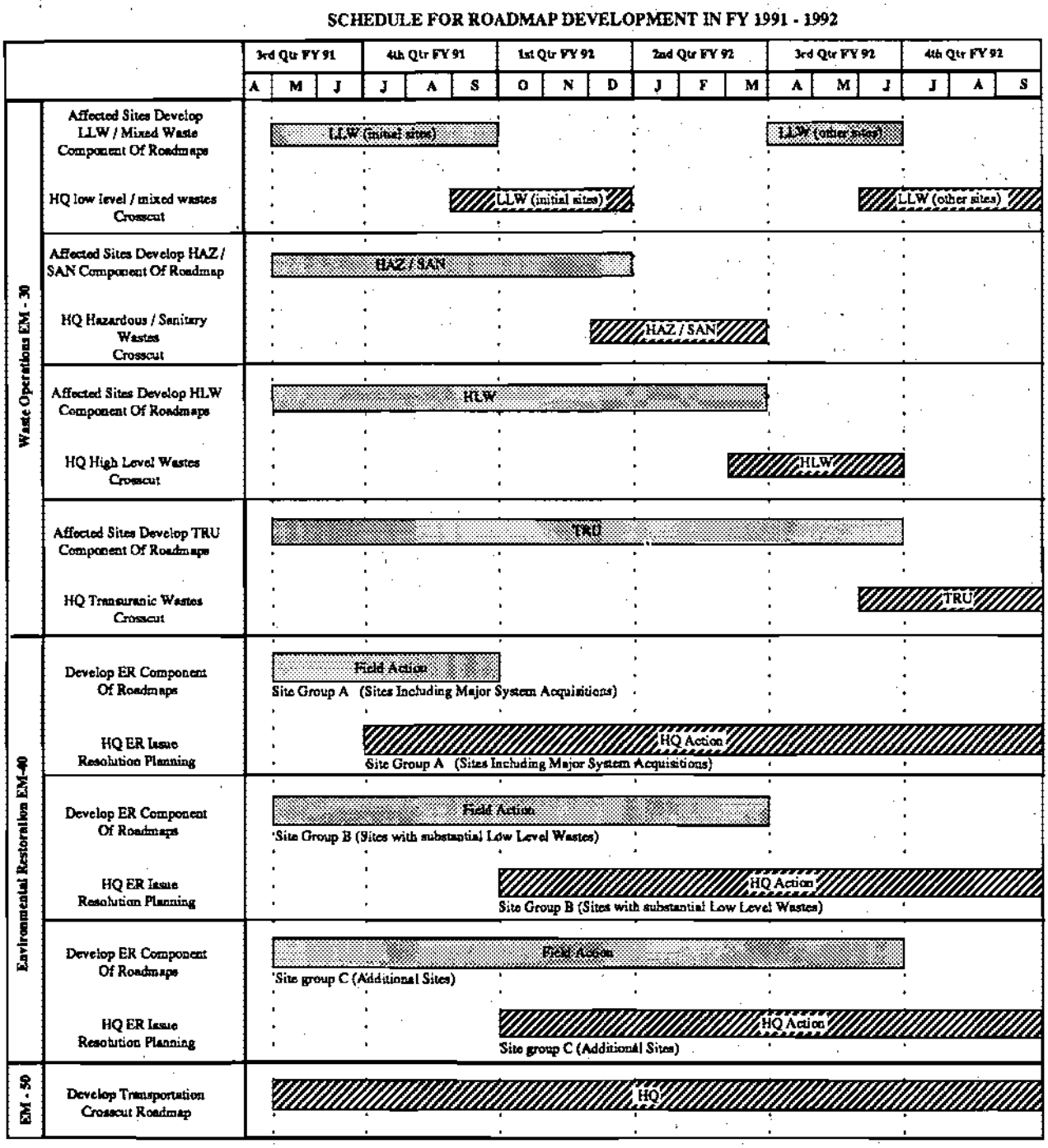


Figure 1.4.7b. Roadmaps are being developed over an 18-month period.

1.4.7.1 ROCKY FLATS ROADMAP

The roadmap for Rocky Flats shows an operational facility with a wide range of waste streams, illustrating the need for national strategies for waste stream treatment, storage, and disposal.

The Rocky Flats roadmap charts the steps being taken to dispose of its current waste backlog and to remediate its contaminated sites. Rocky Flats needs to do this so it will be in legal compliance and can resume its defense production activities.

Why a Roadmap for Rocky Flats ?: All production activities at Rocky Flats are currently shut down, but plans call for restarting these activities at the plant when all safety and environmental concerns are adequately addressed. DOE chose Rocky Flats as an installation to be roadmapped because the issues involved in restarting operations are of special interest (Figure 1.4.7.1). In addition, because Rocky Flats conducts numerous environmental restoration projects and manages a wide range of waste streams, its roadmap is likely to raise issues for DOE to resolve that will help similar cleanup and waste management activities at other DOE installations.

Key Issues Facing Rocky Flats: The roadmapping process identified several issues that block restart and remediation activities. The top four are:

1. Delays in cleaning out solar ponds threaten Rocky Flats' ability to stay in compliance with the Interagency Agreement (IAG);
2. Regulatory requirements are changing and increasing faster than Rocky Flats can react;
3. Rocky Flats has limited waste storage capacity. At the same time, it cannot dispose of its waste onsite, and it cannot store or dispose of it at offsite facilities; and
4. Many wastes have not yet been identified sufficiently for proper treatments to be applied.

Some Initiatives to Resolve the Issues: Analysis of the issues led to their root causes and through them pointed to activities for issue resolution. Technology development provides the solution to some issues and a Technology Development Investment Strategy has been initiated to provide further direction. In addition, a few root causes and actions being taken are:

1. DOE cannot proceed with solar pond RCRA closure activities such as remedial investigation drilling until all sludge is removed from the solar ponds.
   - DOE is evaluating alternative, directional drilling techniques that will allow RCRA closure to proceed in parallel with sludge removal.
2. The length of the budget cycle makes it difficult for Rocky Flats to stay in compliance with the rapidly changing regulations.
   - DOE is evaluating planning methods that can be implemented to improve responsiveness to changing regulations within the constraints of the budget cycle.
3. Rocky Flats has not met the waste

acceptance criteria (WAC) of the intended disposal sites for some waste streams, and the sites cannot accept those waste streams until the criteria are met.

- Rocky Flats is implementing a sampling and analysis program so that currently analyzable waste streams can be evaluated and certified to meet WAC standards. In addition, DOE is developing complexwide analytical capabilities for mixed wastes and residues that cannot be analyzed at this time so that remaining wastes can be certified.

4. Some wastes cannot be properly identified or characterized because approved or proven sampling methods and quality assurance measures for those wastes do not exist.
   - DOE is working with EPA to develop guidance for sampling solid mixed wastes and residues. DOE is also developing methods—to be approved by regulators—for sampling other heterogenous wastes. DOE is making improvements to its quality assurance programs to ensure that sampling is of consistently high quality.

Lessons Learned: Two main lessons were learned in the development of the Rocky Flats roadmap:

- To meet near-term waste management objectives, Rocky Flats needs a comprehensive (and approved) sampling and analysis program. Expanded laboratory capacity is a necessary component of such a program.
- Roadmaps and their development proved to be a good opportunity for getting the local DOE office more closely involved in the activities of the site contractor.

Future Direction: Future roadmapping at Rocky Flats will aim to devise schedules that hasten progress with treatment facilities, technology development, and site cleanup and that keep Rocky Flats in compliance with the IAG and AIP.

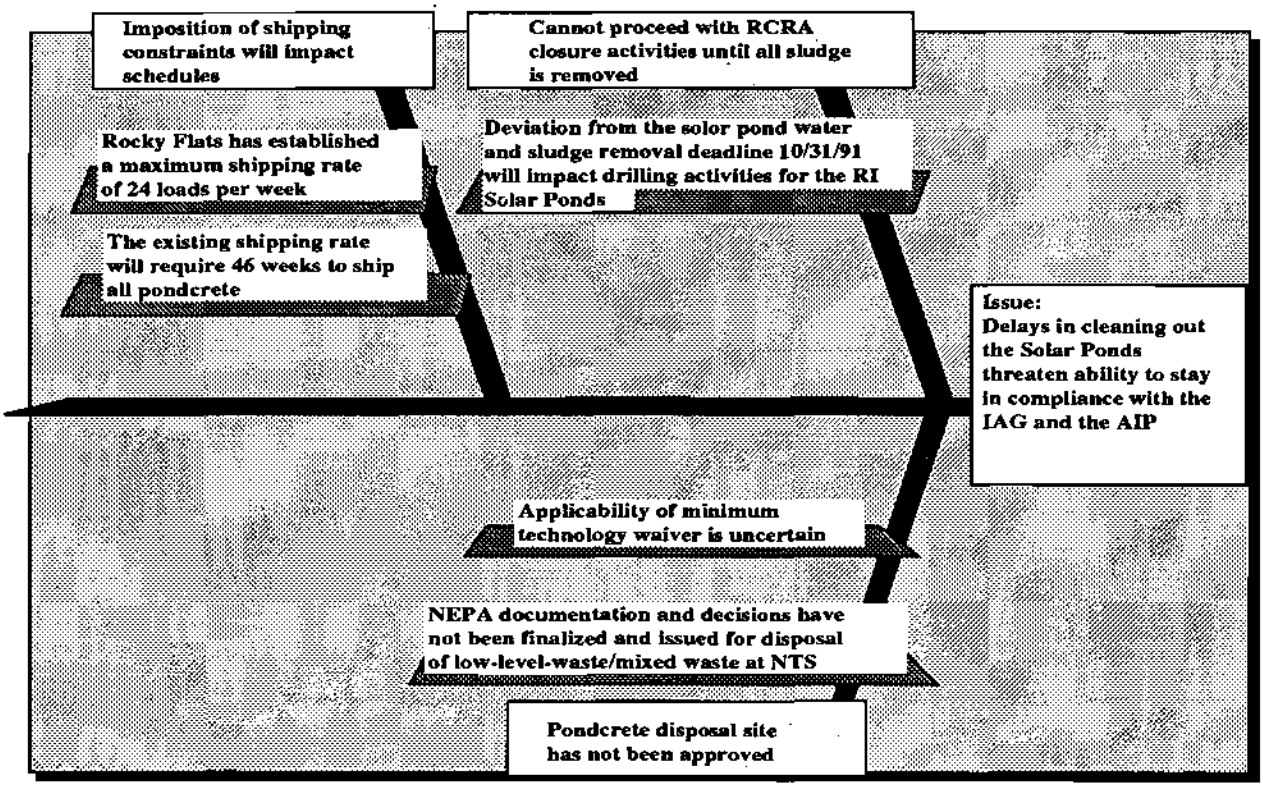
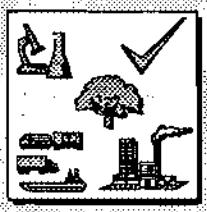


Figure 1.4.7.1. The fishbone diagram for root-cause analysis is a key component in the roadmap methodology. (NTS = Nevada Test Site, NEPA = National Environmental Policy Act)

1.4.7.2 HANFORD SINGLE-SHELL TANK ROADMAP



The Hanford Single-Shell Tank (SST) roadmap covers the stabilization and remediation of 149 large underground storage tanks containing highly radioactive mixed wastes. This roadmap addresses complying with hazardous waste regulations applicable to mixed waste and resolving tank safety issues.

The Hanford SST roadmap charts the near-term waste management activities to ensure safe interim storage for disposal of 37 million gallons of highly radioactive waste. Almost half of the SSTs are known or suspected to have leaked. The roadmap also includes closure of the 6 SST sites containing the 149 SSTs.

Why a Roadmap for the SST Program?
DOE Headquarters chose SST as an activity to be roadmapped because of the safety issues that have emerged at Hanford since the FY 1992-1996 Five-Year Plan. In addition, it was chosen because SST activities combine issues related to waste operations, environmental restoration, and technology development. The results of this roadmap can be used at other installations that have SSTs, such as Savannah River.

Key Issues Facing SST Program: The Hanford roadmap identified five major issues that must be resolved:

1. The current method for storing waste is potentially not safe or environmentally sound.
2. The SST program's ability to meet the committed closure milestones is uncertain.
3. National Environmental Policy Act pathways have not been defined for the SST program.
4. Regulatory closure requirements as specified by outside agencies such as the State of Washington, EPA, and the Nuclear Regulatory Commission do not agree with the Hanford Defense Wastes Environmental Impact Statement's approach to closure.
5. The technology development process is still evolving.

Some Initiatives to Resolve the Issues:
Analysis of the issues led to their root causes and through them pointed to activities for issue resolution. A few of these root causes and the actions being taken follow.

1. Conditions exist in several of the SSTs that could potentially result in fires or explosions (flammable hydrogen gas mixture in 18 SSTs, potential explosive ferrocyanide mixtures in 23 SSTs, organic-nitrate mixture in 8 SSTs). The problem is complicated by an incomplete understanding of reaction mechanisms and waste content.

   - Activities are under way to sample and characterize the wastes and gases so that proper interim measures can be taken until final disposal takes place. Laboratory studies of reaction mechanisms and interim remediation measures will be undertaken prior to closure of the SSTs.

2. The radioactive decay heat is dissipated by adding water to tank 106-C. If the tank

were to leak, it would add to the release to the soil column.

- Activities are under way to sample and characterize the waste and to examine alternative remedial actions (e.g., partial waste retrieval, alternative cooling methods).

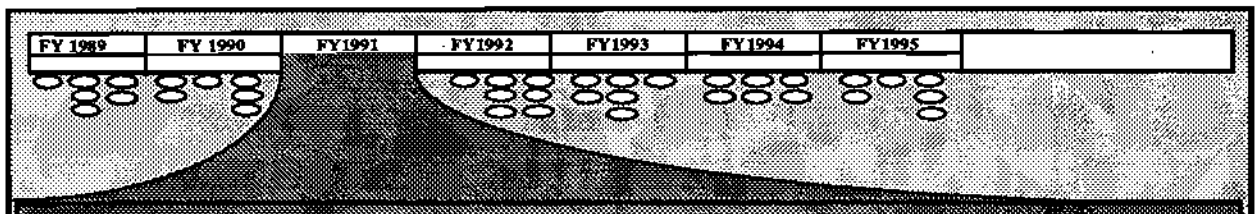
3. Detailed closure schedules cannot be prepared until closure options are selected. Additionally, these options will be analyzed and selected as part of the Supplemental Environmental Impact Statement (SEIS). However, the scope of the SEIS is undetermined and information (i.e., tank waste characterization) necessary to select closure options is lacking.

- Activities to obtain the necessary scientific and engineering data are ongoing and specific parts of the program are undergoing integration and possibly acceleration.

Lessons Learned: Two main lessons were learned in developing the SST roadmap:

- Planning and resource allocation for the SST must be integrated with that for other programs at Hanford.
- Long-range plans benefit from certain activities being taken care of as soon as possible. In the case of SST, those activities are characterizing wastes, evaluating technologies, and preparing Supplemental Environmental Impact Statements.

Future Direction: The SST roadmap will focus on developing and adjusting plans to improve the technical basis of decisions and to reach Tri-Party Agreement milestones (Figure 1.4.7.2). The SST program staff will strive to work better with regulators and Tribal governments and expand its public outreach programs in order to ensure successful completion of the SST program.

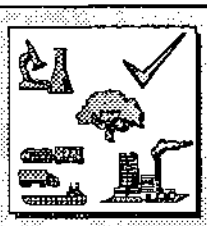


Single-Shell Tank Milestones FY 1991

Category	Milestone date	Tri-Party Agreement milestone	Milestone description
WM	9/91	M-05-03	Interim stabilize 9 single-shell tanks
-	-	M-05-03c	Interim stabilize 4 single-shell tanks
ER	9/91	M-10-04c	Obtain 4 core samples from 2 tanks
ER	9/91	M-10-05	Obtain 16 core samples from 6 tanks
TD	10/90	M-06-01	Identify waste retrieval technologies to be tested in a scale model tank.
WM	12/90	M-24-07	Install 11 additional wells around the single-shell tanks for a total of 23 RCRA monitoring wells.

Figure 1.4.7.2. As part of the roadmapping process, milestone diagrams are prepared, which for the Hanford SSTs milestone diagram depict the Waste Management (WM), Technology Development (TD), and Environmental Restoration (ER) Programs milestones for the life cycle of the program.

1.4.7.3 IDAHO BURIED WASTE PROGRAM ROADMAP



The initial roadmap for the Idaho National Engineering Laboratory (INEL) Buried Waste Program (IBWP) illustrates the need for a comprehensive life cycle planning basis including all relevant regulatory and management requirements.

The INEL IBWP roadmap examines the remediation of sites containing low-level and transuranic radioactive wastes buried in shallow trenches and pits. Some of the wastes have leached through the soil and threaten the Snake River Plain aquifer.

Why a Roadmap for IBWP? The IBWP faces issues similar to other installations with buried low-level and transuranic-contaminated wastes. Among these installations are Hanford, Savannah River, and Oak Ridge. Because the Waste Isolation Pilot Plant performance with respect to land disposal restricted wastes is still unknown, these sites face uncertainty in planning for disposal. Additionally, they must resolve the issues associated with working within the CERCLA process to clean up this complicated, radioactively contaminated site. The CERCLA-prescribed schedules do not easily accommodate the long lead times associated with obtaining treatment, storage, and disposal options for wastes of this nature. The initial IBWP roadmap takes a first step to resolve these issues.

Key Issues Facing the IBWP: The IBWP roadmap identified three issues that must be resolved before remediation can proceed in a timely manner:

1. As new agreements supersede previous agreements, uncertainty about which milestones and goals are in effect for the program blocks progress (Figure 1.4.7.3).

2. Under the CERCLA decision-making process, the choice of remediation approach is unknown until the Record of Decision is made. This makes long-term planning difficult.

3. The process for working with all interested parties on the buried waste program is not effective. The process is burdened with excessive "red tape" and poor communications.

Some Initiatives to Resolve the Issues: Analysis of the issues led to their root causes and through them pointed to steps for issue resolution. A few of these root causes and the actions being taken are:

1. In April, 1991, EPA Region X agreed to conduct the Environmental Restoration Program according to the draft Interagency Agreement, in expectation of its finalization in the coming months.

2. The difficulty in planning for treatment of land disposal restricted waste and uncertainty about a final repository means that DOE cannot presently implement a disposal strategy. Therefore, DOE has initiated an Integrated Demonstration for the IBWP

that will address options for waste treatment for disposal or long-term storage. The selection or location of a final repository remains an unsettled issue.

3. Because key personnel from the State of Idaho, EPA, DOE, and the INEL contractors do not have a common basis of understanding of the terms and principles governing the interaction of DOE and CERCLA procedures, DOE will improve communications and understanding regarding environmental regulations specific to DOE operations. This will include a training process for the participants.

4. Technical discussions among the different organizations are difficult to arrange, which often delays decisions and thus implementation. Consequently, DOE is looking for less formal procedures that will improve communication and common understanding of issues, while establishing an integrated process for planning and constructing facilities.

Lessons Learned: The two main lessons learned from the IBWP roadmap are:

- Until the goals and objectives for the IBWP are clearly agreed on and understood by all parties, there will be uncertainty in planning and a potential for misdirected effort.
- Long-range planning requires a roadmap that also covers operations not directly related to cleanup. The IBWP roadmap identified many interfaces within INEL and will likely identify others as the roadmap scope is expanded.

Future Direction: Now that a life cycle planning basis exists, the IBWP roadmap scope will be expanded to include other concerns, such as technology development, treatment facilities, and program support. Incorporation of those plans and activities will improve the current roadmap and facilitate the resolution of important issues.

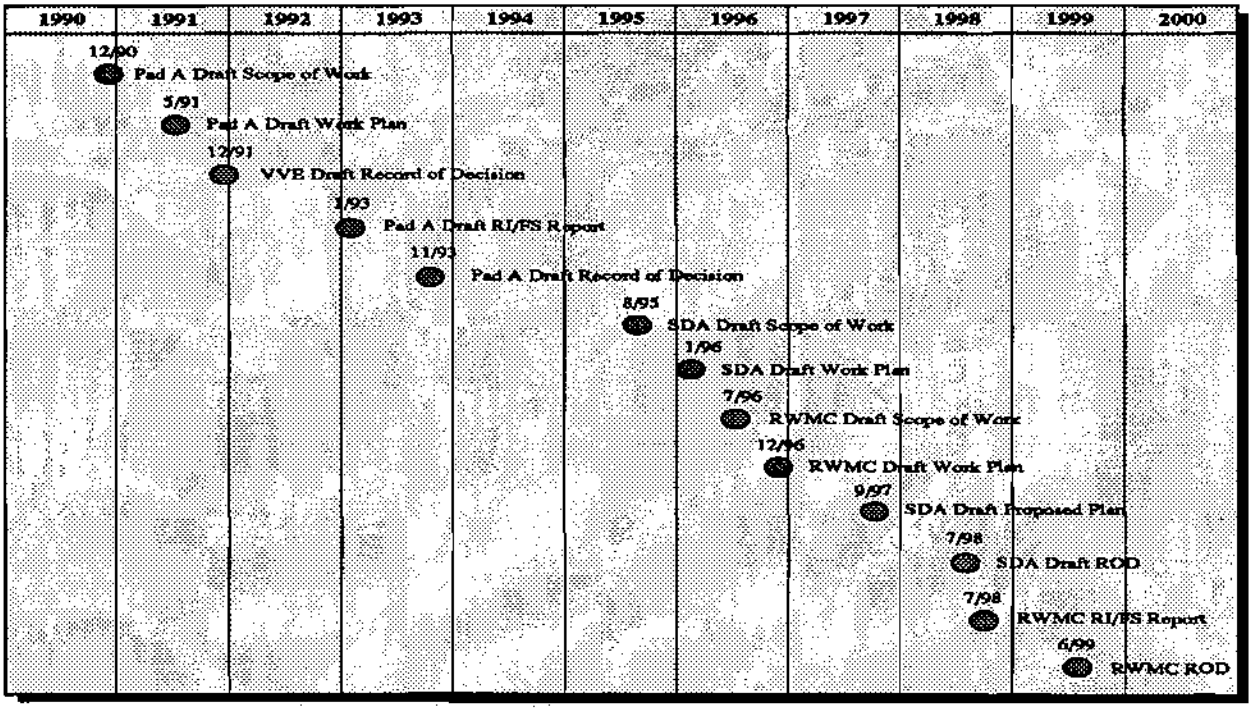


Figure 1.4.7.3. In the assessment phase of roadmapping a list of key deliverables is compiled, such as for IBWP. (SDA = Subsurface Disposal Area, RWMC = Radioactive Waste Mangement Complex, ROD = Record of Decision)

1.4.7.4 FEED MATERIALS PRODUCTION CENTER ROADMAP

The Feed Materials Production Center (FMPC) roadmap shows all activities, including environmental restoration, waste operations, technology development, and landlord functions necessary to achieve final facility shutdown and cleanup. The comprehensive roadmap shows the importance of early material disposition decisions for a site in transition to shutdown status.

FMPC at Fernald, Ohio, ended its production mission in 1988 and has begun activities to achieve permanent safe shutdown. The site was officially scheduled to be closed on February 4, 1991. Radioactive and other hazardous materials at the site must be handled appropriately to mitigate environmental impacts. The FMPC roadmap traces the steps needed to clean up the FMPC site. Lessons learned here will affect similar decommissioning and cleanup activities at other DOE sites.

Why a Roadmap for FMPC? FMPC operations accumulated about 300,000 yd^3 of radioactive materials. This volume would fill a 16-story building the size of a football field. This amount does not include waste generated during cleanup activities. The FMPC roadmap helps answer the important questions of how to close a DOE weapons complex facility so that waste materials created during operations are properly treated and disposed of and how the site itself should be remediated so that it does not endanger its surroundings.

Key Issues Facing FMPC: The FMPC roadmap identified several issues that affect site transition and remediation. Three of the most urgent are:

1. CERCLA program procedures have not been fully integrated with ongoing facility operations;
2. The long-term disposition of stored onsite materials, particularly thorium, needs to be decided; and
3. A significant increase in available mixed-waste laboratory capacity is required to precisely determine the nature of the wastes.

Some Initiatives to Resolve the Issues: Analysis of the issues led to their root causes and through them pointed to activities for issue resolution. Following are a few of these root causes and actions being taken.

1. To address the CERCLA planning issue, DOE needs to develop a method for applying steps in the CERCLA process to an installation shutting down. Achieving consistency with EPA requirements for sampling and analysis is one component of making this successful.
   - DOE is unifying site activities to get FMPC managed as a CERCLA site.
2. The thorium disposition issue hinges on DOE making a decision as to whether the FMPC thorium should be classified as waste. The Nevada Test Site can accept thorium for disposal only if it is declared a waste (Figure 1.4.7.4).
   - DOE Headquarters is working to make the proper decision as to whether thorium at FMPC should be treated as a strategic metal or a waste.
3. There is inadequate laboratory capacity both at FMPC and commercially available

facilities. Using commercial laboratories requires new quality assurance programs.

- FMPC is expanding its laboratory facilities and at the same time lining up commercial laboratory support. For that support, FMPC is seeking EPA approval for FMPC's revised quality assurance program plan.

Lessons Learned

Two main lessons were learned in the making of the FMPC roadmap:

- The roadmap process helped FMPC to better integrate its programs.
- FMPC staff knew about almost all of the high-level issues raised, but roadmapping helped to more precisely define the issues, reach down to their root causes, and focus the correct organizations on their solution.

Future Direction

The next phase of roadmapping for FMPC will include full integration of the roadmap with the Five-Year Plan, implementation of the data management system, and in-house development of the documentation required to keep the roadmap current and viable.

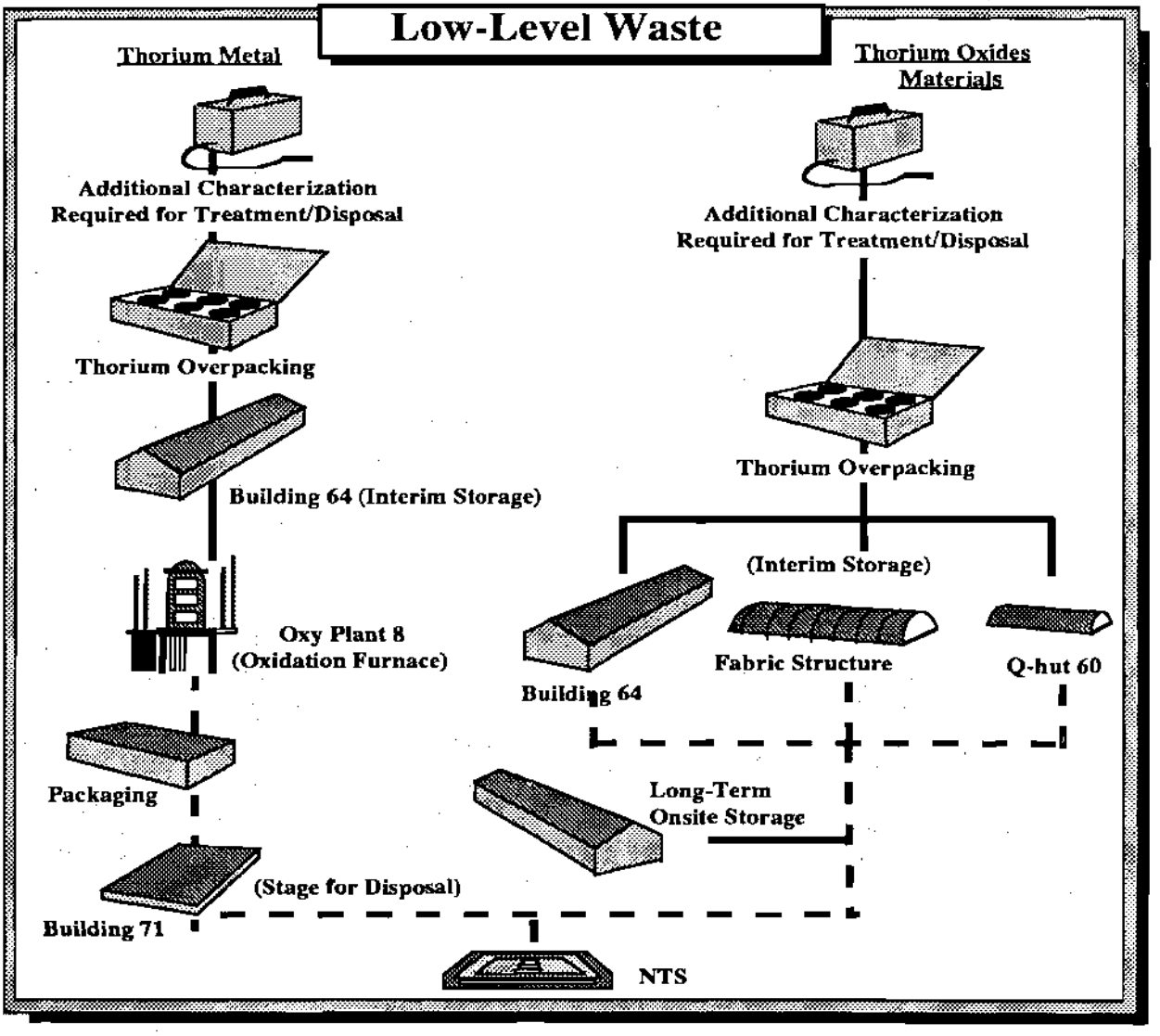


Figure 1.4.7.4. Logic diagrams are prepared as part of the roadmapping process, which in the case of the FMPC indicate a series of critical steps in the low-level waste process for thorium.

Environmental Restoration & Waste Management

Five-Year Program Plans
1993-1997

SECTION 2

August 1991

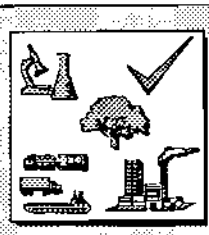
ENVIRONMENTAL RESTORATION & WASTE MANAGEMENT

Five-Year Program Plans
1993-1997

SECTION 2

August 1991

2.0 FIVE-YEAR PROGRAM PLANS — INTRODUCTION



Although described in this plan as five separate activities, the individual subprograms are closely related and are focused on achieving a corporate set of program objectives and jointly support the 30-year cleanup goal.

Integration of the Subprograms: EM consists of five major subprograms: Corrective Activities, Waste Management, Environmental Restoration, Technology Development, and Transportation. These subprograms are interdependent parts of the overall EM program, sharing its overall goals and pursuing its overall objectives.

Corrective Activities and Waste Management are managed by the Office of Waste Operations (EM-30) and Environmental Restoration by the Office of Environmental Restoration (EM-40). The Office of Technology Development (EM-50) manages Technology Development and Transportation Management. The five subprograms are addressed in Section 2 as follows:

- Corrective Activities: The Corrective Activities Program was established to provide discrete, focused efforts for achieving compliance with applicable local, State, and Federal regulations.

  Section 2.1 consists of an overview of Corrective Activities, including the scope, goals, objectives, key areas, and declining resource requirements of the program. Also addressed are highlights and accomplishments of Corrective Activities since the FY 1992-1996 Five-Year Plan.

- Waste Management: The Waste Management Program focuses on the management of waste using appropriate treatment, storage, and disposal technologies. All DOE waste, whether generated by processing, manufacturing, research activities, or site cleanup activities, is managed under the auspices of the Waste Management Program and is given the utmost priority for safety to the public, workers, and the environment.

  Section 2.2 provides a thorough overview of the Waste Management Program along with highlights and accomplishments for the past year. It also gives a program status for the major programs including High-Level Waste, Transuranic Waste, Mixed Transuranic and Low-Level Waste, Low-Level Waste, Hazardous Waste, Sanitary Waste, and Waste Minimization.

- Environmental Restoration: The Environmental Restoration Program is concerned with all aspects of assessment and cleanup of both contaminated facilities in use and of sites that are no longer a part of active operations. As a result, remedial activities, which are most often concerned with contaminated soil and groundwater, or decontamination and decommissioning are responsibilities of this program.

Section 2.3 provides an overview of the Environmental Restoration Program, describes the implementation of Environmental Restoration activities, and summarizes accomplishments since the FY 1992-1996 Five-Year Plan. It also presents field office Environmental Summaries, which include descriptions of the Environmental Restoration Program at each of the field offices and include the funding projections for the programs over the FY 1991-1997 planning period.

- Technology Development: Technology Development is a program established to initiate and maintain an aggressive national program for applied research and development, to resolve major technical issues, and to rapidly advance beyond current technologies to find solutions for all EM programs. Technology Development is also concerned with ensuring the availability of a technical work force and with ensuring regulatory acceptance of technologies.

  Section 2.4 addresses the Technology Development program, including the mission, program mandates, and overview. The vision of the program is illustrated through descriptions of integrated demonstrations and integrated programs and lists accomplishments generated by Technology Development programs. It also highlights the rationale for program strategies, delineates the approach for managing technology development programs, and describes the process of technology integration and environmental education initiatives.

- Transportation Management: The Transportation Management Program is responsible for coordination of all current and planned unclassified transportation and with the safe movement of wastes between facilities for the purposes of treatment, storage, and disposal. Compliance with applicable regulations, Department of Transportation requirements, and appropriate certification issues is an overriding issue of this program.

  Section 2.5 presents the transportation program mission and program mandates. This section gives the scope and accomplishments of key elements of the Transportation Management Program, describes certain constraints within which the program operates, and illustrates the work scope and funding plans for FY 1991-1997.

2.1

Corrective Activities

2.1.1.1 SCOPE, GOALS, AND OBJECTIVES

DOE continues its high-priority activities of bringing active and standby facilities into compliance with Federal, State, and local regulations.

DOE has ongoing activities to achieve and maintain regulatory compliance. The Corrective Activities category constitutes only those activities and projects necessary to correct an out-of-compliance condition that has been cited by the regulators. This category was created to handle out-of-compliance situations of a historical nature. As depicted in Figure 2.1.1.1a, an initial increase in the number of Corrective Activities as out-of-compliance circumstances was identified. The peak in the number of activities has been reached, and as these situations are resolved, the number of Corrective Activities is steadily declining.

Corrective Activities are discrete, focused efforts for achieving compliance in an expedient manner. Maintaining compliance belongs to the appropriate Waste Management Operations or other programmatic activities such as Defense Programs or Nuclear Energy (i.e., DOE will operate all of its facilities in compliance with all applicable regulations). Moreover, potential current and future out-of-compliance circumstances are now resolved under the appropriate Waste Management Operations or other programmatic activities. Consequently, Corrective Activities are working off the backlog of out-of-compliance situations, and once the backlog has been eliminated, "Corrective Activities," as a discrete management category, should no longer be required, as depicted in Figure 2.1.1.1a.

Corrective Activities follow a life cycle consisting of identification, evaluation, funding, implementation, and closeout. Routine activities or long-term programmatic efforts are outside the scope of Corrective Activities and belong to the appropriate operational organization. For example, routine sampling and monitoring in accordance with a compliance agreement is not a Corrective Activity; whereas, establishing a new monitoring system can be a Corrective Activity if it is undertaken to eliminate an identified out-of-compliance situation.

All Corrective Activities are Priority 1 because of DOE's desire to achieve regulatory compliance. This ensures that all out of compliance conditions are handled with the highest priority within the Five-Year Plan and that funding is quickly identified for rapid implementation.

DOE's goal is to operate in full compliance with all applicable regulations. It is anticipated that all Corrective Activities will be completed by the end of 1997, and at that time, DOE facilities will be fully compliant under the base programs.

The major drivers for Corrective Activities are Federal and State environmental regulations [e.g., RCRA, Toxic Substances Control Act, Clean Water Act (CWA), Clean Air Act (CAA), and the Safe Drinking

Water Act (SDWA)]. DOE uses a large variety and quantity of solvents and metals, once categorized as waste, are subject to regulatory requirements. CWA, CAA, and SDWA regulate the many emissions and effluents from DOE facilities.

Corrective Activities encompass the full spectrum of media and waste type and typically involve chemical compounds. A large fraction of DOE facilities dates from the 1940 and 1950 time frames. The materials and methods of construction are historic to that period when the environment, safety, and health were less emphasized than they are today. For example, polychlorinated biphenyl (PCB) additives were frequently used as fire retardants, and only single containment of process reagents and piping was used. Also, after 40 years, the physical plant and structures have significantly deteriorated. Therefore, it is not surprising that some of the major Corrective Activities include isolating the PCB-impregnated gaskets at the gaseous diffusion plants, cooling water discharge exceedences (chloride, temperature, and total suspended solids), and inadequate sanitary sewer lines and treatment facilities.

DOE continues to use an intraorganizational management approach as shown in Figure 2.1.1.1b. This crosscutting approach ensures priority funding and quick resolution. The Corrective Activities are managed by responsible DOE Program Secretarial Offices, as depicted in Figure 2.1.1.1b, which promote full accountability for operations associated with their respective facilities. EM, in addition to having the line management responsibility for its own facilities, is responsible for overseeing and coordinating all Departmental Corrective Activities, including the budget functions. Day-to-day management, execution, and reporting are the responsibility of the appropriate DOE field office for the facilities involved.

DOE manages Corrective Activities to minimize and eventually eliminate risks to health, safety, and the environment. Forty-nine Corrective Activities have already been completed, and another 54 are expected to be completed in FY 1991.

The ever-expanding and evolving regulations complicate the management of Corrective Activities. New regulations have been passed, and more codifications and interpretations have been made in the past year. DOE remains committed to bringing all of its facilities into compliance with all applicable regulations in a timely manner.

DOE is using internal as well as independent assessments and audits as tools to create a new culture that provides environmental compliance and accountability. As noted in Section 1, numerous assessments (e.g., Tiger Teams) were completed in the past year. These assessments identify areas of concern and corrective actions that must be taken to achieve full compliance.

Figure 2.1.1.1c displays the number of new Corrective Activities identified by the two previous Five-Year Plans and by this Plan. Clearly, the number of new Corrective Activities are rapidly decreasing. In the current Five-Year Plan, only two new Corrective Activities have been identified; these concern asbestos contamination on nickel ingots and PCB-contaminated effluents at the Paducah Gaseous Diffusion Plant. DOE now plans for compliance under the base programs (Waste Management) and should avoid future Corrective Activities.

DOE also expeditiously resolves some compliance deficiencies under the base programs, such as the replacement of deteriorating transfer pipes with double encased lines. These are not separately managed as Corrective Activities but are managed as Waste Management or program operations activities.

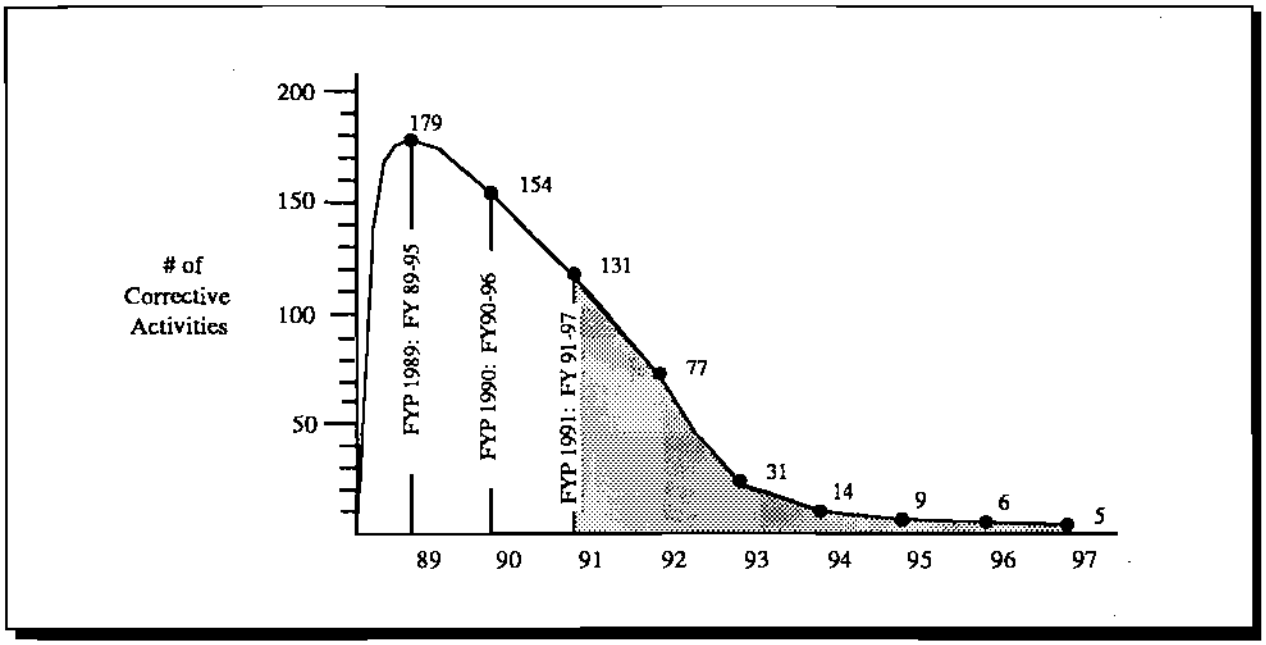


Figure 2.1.1.1a. The number of Corrective Activities quickly reaches a maximum and then rapidly declines. (FYP = Five-Year Plan)

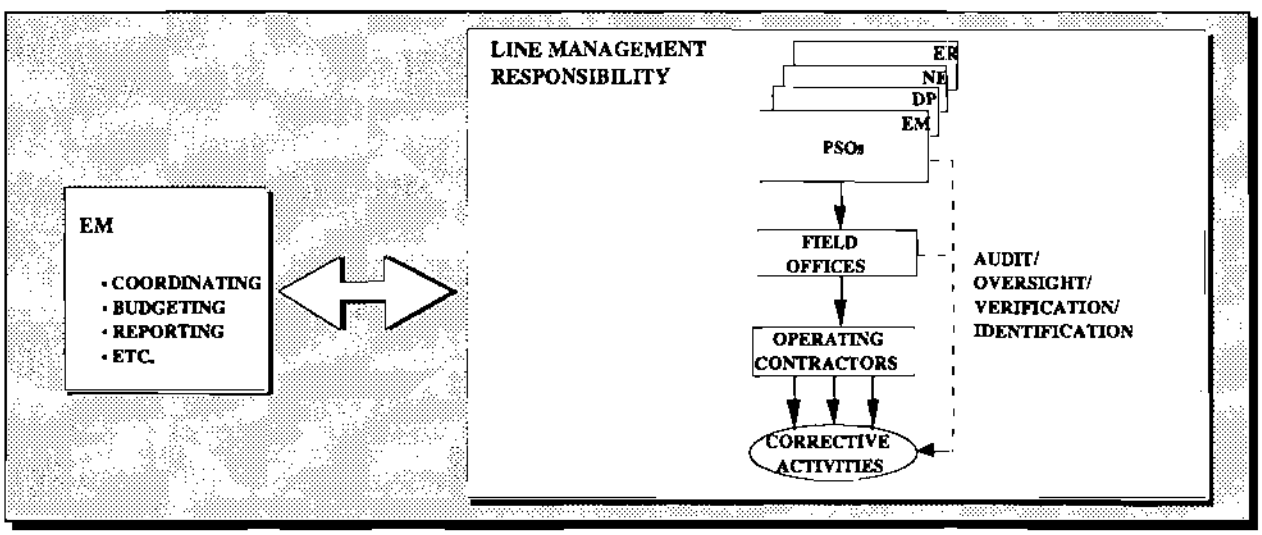


Figure 2.1.1.1b. DOE's organizational structure for managing Corrective Activities promotes full line management accountability and provides for effective coordination across the various Program Secretarial Offices. (DP = Defense Programs, NE = Nuclear Energy, ER = Energy Research, PSO = Program Secretarial Office)

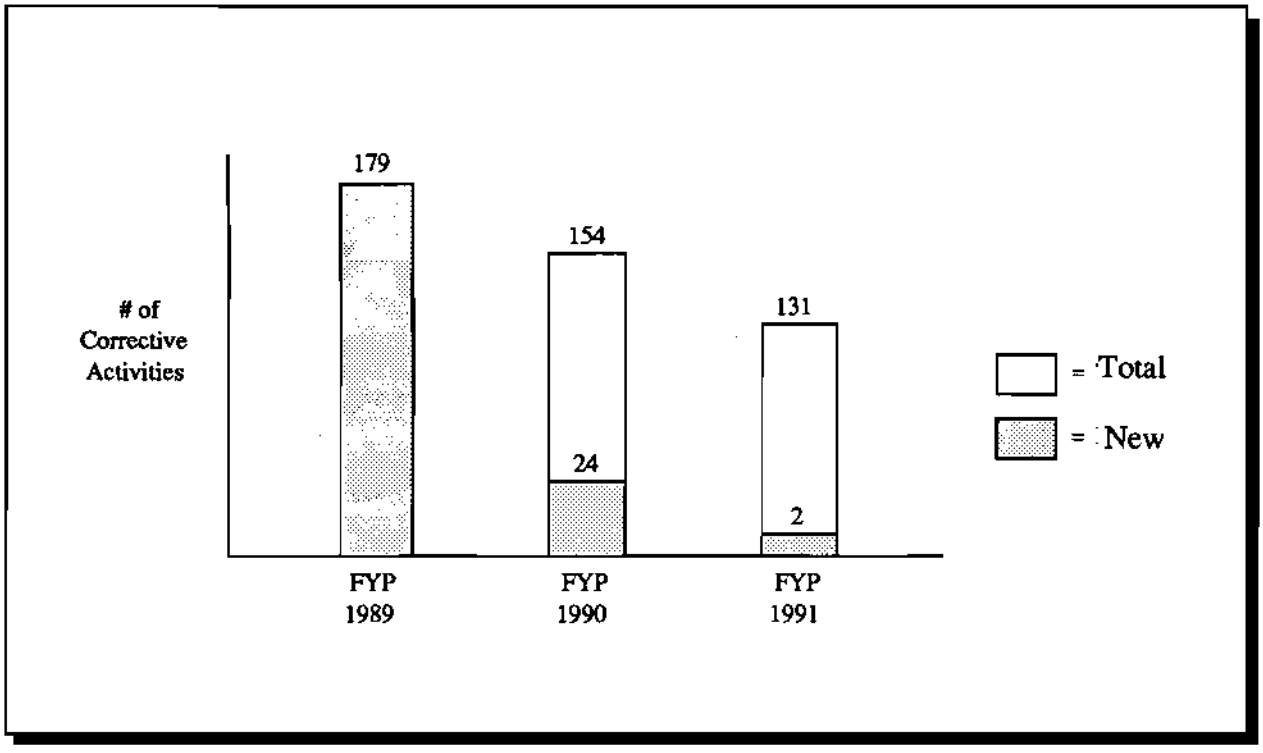


Figure 2.1.1.1c. The number of newly identified Corrective Activities is rapidly decreasing.

2.1.1.2 KEY AREAS

Corrective Activities involve the industrial aspects of DOE operations and fall into the five principal categories of sanitary waste treatment, air permits/monitoring, polychlorinated biphenyl (PCB) activities, cooling water discharges, and RCRA requirements.

Corrective Activities principally involve the industrial, manufacturing, and physical plant aspects at DOE facilities. DOE uses many different materials and reagents in the manufacturing and processing of nuclear materials. The management of these chemicals is subject to a variety of regulations during their useful life and after they become designated as "wastes."

Corrective Activities vary by field office and media, as summarized in Figures 2.1.1.2a and 2.1.1.2b. Twenty-two refer to air emissions (e.g., emissions of uranium dust and volatile organic compounds). Fifty-two also pertain to water streams such as once-through cooling water. Fifty-seven pertain to solids pollution (e.g., diffusion plant gaskets).

Several broad categories describe the majority of the Corrective Activities. These include PCB activities, sanitary waste treatment, air permitting/monitoring, cooling water discharges, and RCRA requirements and account for some 74 percent of the total, as depicted in Figure 2.1.1.2c. These categories are not unique to DOE nor related to the nuclear nature of the facilities.

Two of the major Corrective Activities include isolating the PCB-contaminated gaskets in the gaseous diffusion plants at Paducah, Kentucky, and Portsmouth, Ohio. These plants contain miles of ducting used to cool the compressor motors and provide ventilation and heat to the plant areas. There are some 90,000 gaskets sealing the joints between the sections of ducting, and, as was the custom at the time that these plants were built in the 1950s, these gaskets were impregnated with PCB materials for fire retardancy. Over the years, oil (from the compressor motors) and radionuclides (from the process) have collected and pooled at the gaskets, migrated, and partially dissolved the PCB material into the oil. At irregular frequencies, the contaminated oil subsequently drips from the gasket onto the operating floor below and results in a small spill that must be cleaned. This phenomenon constitutes the use of PCBs in a nontotally enclosed system, which does not meet the requirements of the Toxic Substances Control Act (TSCA). The Corrective Activity for this problem involves troughing and collecting the oil drips for subsequent treatment. The long-term, programmatic solution suggests removing and replacing the gaskets with non-PCB-containing materials.

The gaseous diffusion facilities at the Oak Ridge K-25 Site have similar gasket and spill problems. However, these facilities no longer operate, have been shut down, and are awaiting decontamination and decommissioning (D&D). Consequently, the Oak Ridge plant is handled under the Environmental Restoration Program instead of under Corrective Activities.

There are other PCB and TSCA concerns in the complex regarding electrical equipment and lubricating oil systems. For example, PCB-contaminated oil was inadvertently added to the lubrication systems at Portsmouth; consequently, 8 of its 29 systems have PCB levels exceeding acceptable levels. These are being cleaned up as part of a Corrective Activity.

DOE uses the best currently available technology to expediently treat Corrective Activities since they must be completed in a timely and effective manner in order to protect public health, safety, and the environment. Consequently, delays are avoided by the application of existing technologies rather than investing time to develop new technologies that require new facilities. Every reasonable opportunity will be utilized to incorporate the most modern, demonstrated, and best available technology into the facility processes. This is especially true if the facility is expected to operate for many years.

Responses to Corrective Activities are developed and, in some cases, compliance agreements are negotiated in consultation with the regulatory agencies. Funding requirements are included in annual updates to this Plan and submitted as part of DOE's annual budget process. Upon receipt of funding, the Corrective Activities are implemented. If sufficient funding is not provided by Congress, then DOE will initiate discussions with the regulators and coordinate resources to evaluate possible alternative approaches.

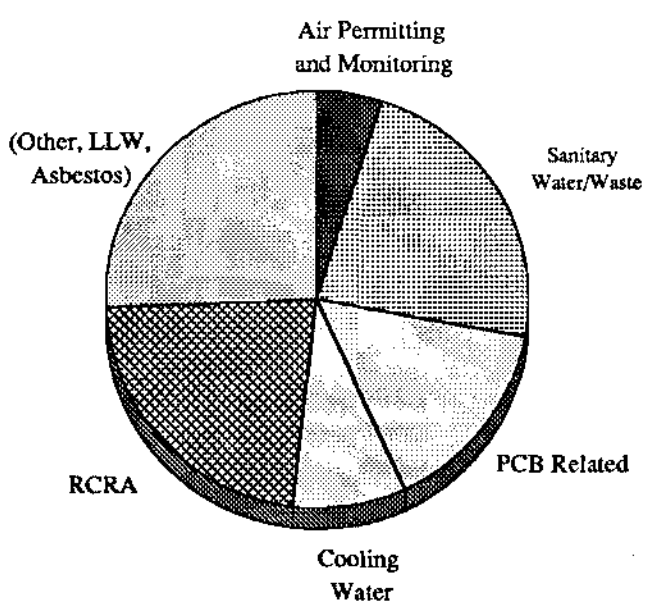
Field Office	Air		Water		Solids		Totals	
	#	$K	#	$K	#	$K	#	$K
AL	5	6,612	10	31,860	14	36,151	29	74,623
CH	1	1,081	11	17,546	9	3,891	21	22,518
FS	1	2,483	2	25,481	1	20,500	4	48,464
ID	0	0	0	0	6	20,978	6	20,978
NV	2	1,435	3	660	4	401	9	2,496
OR	1	200	17	86,533	10	145,321	28	232,054
RL	2	2,786	2	15,217	11	21,224	15	39,171
RF	4	3,067	1	565	0	0	5	3,632
SAN	6	32,950	4	4,012	2	16,055	12	53,017
SR	0	0	2	47,600	0	0	2	47,600
TOTALS	22	50,614	52	229,474	57	264,521	131	544,609

FY 91 through FY 97

Figure 2.1.1.2a. The number of Corrective Activities and associated costs vary by media and the field offices. (AL = Albuquerque Field Office, CH = Chicago Field Office, ID = Idaho Field Office, NV = Nevada Field Office, OR = Oak Ridge Field Office, RL= Richland Field Office, RF = Rocky Flats Field Office, SAN = San Francisco Field Office, SR = Savannah River Field Office)

Field Office	Funding $1000s						
	Current Year FY 91	Budget Year FY 92	Planning Years				
			FY 93	FY 94	FY 95	FY 96	FY 97
AL	20,930	27,912	15,356	3,601	2,632	2,254	1,938
CH	9,383	10,898	2,237	0	0	0	0
FS	48,464	0	0	0	0	0	0
ID	13,978	7,000	0	0	0	0	0
NV	836	1,660	0	0	0	0	0
OR	24,958	56,796	54,910	28,408	18,082	42,200	6,700
RL	22,795	13,977	2,455	0	0	0	0
RF	1,381	2,251	0	0	0	0	0
SAN	5,357	22,960	15,700	9,000	0	0	0
SR	47,600	0	0	0	0	0	0
TOTALS	195,682	143,454	90,658	41,009	20,714	44,454	8,638

Figure 2.1.1.2b. The Funding Requirements for Corrective Activities peak in FY 1991 and then decline.



	$ K
Air Permitting and Monitoring	26,755
Sanitary Water/Waste	125,431
PCB Related	82,972
Cooling Water	48,430
RCRA	119,577
(Other, LLW, Asbestos)	141,444
Total (FY91-FY97).	544,609

Figure 2.1.1.2c. Most Corrective Activities fall into several broad categories. (LLW = low-level wastes)

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2.1.1.3 RESOURCE REQUIREMENTS: ON THE DECLINE

Funding requirements for Corrective Activities have peaked and are on the decline.

The number of Corrective Activities has decreased; 179 were identified in the first Five-Year Plan, and 154 were identified in the second Five-Year Plan. One hundred thirty-one Corrective Activities remain in this Plan. Although some of the previously identified Corrective Activities were erroneously categorized and later transferred into the base programs [e.g., EM, Defense Programs (DP)], the decrease is largely due to completed activities. The associated funding requirements have also peaked and are currently decreasing, as depicted in Figure 2.1.1.3a. Spending requirements include $195.7M in FY 1991, $143.5M in 1992, and an estimated $205.5M for fiscal years 1993-1997, at which time all currently identified Corrective Activities will be completed.

Most of the funding requirements for Corrective Activities fall into the five principal categories of polychlorinated biphenyls (PCBs), sanitary waste treatment, air permitting/monitoring, cooling water, and RCRA requirements as depicted in Figure 2.1.1.3b. It is anticipated that, after 1995, only the PCB-, sanitary-, and asbestos-related activities will remain.

Funding requirements have peaked in 1991-1992 and decline in 1993-1997. The breakdown by the Program Office is depicted in Figure 2.1.1.3c. DP and Uranium Enrichment (UE) provide the greatest fraction of the funding for Corrective Activities. The DP share is $60.0M in FY 1992, an estimated $32.1M in 1993, and drops to zero in 1997. UE currently provides $9.3M; this amount is expected to increase to $36.9M in FY 1993 and decrease to $6.7M in 1997.

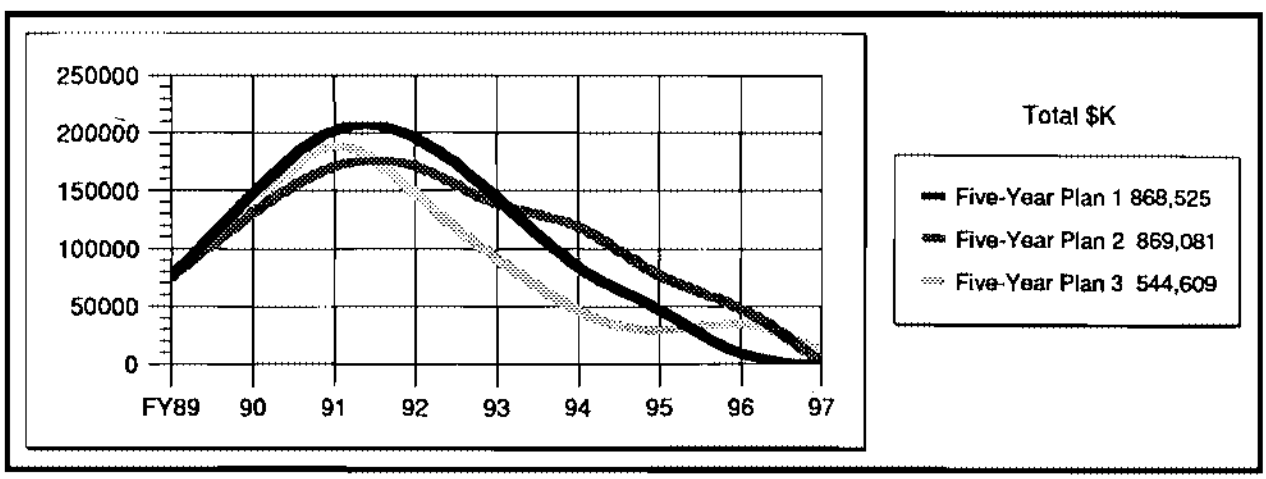


Figure 2.1.1.3a. Funding Requirements for Corrective Activities have peaked and are on the decline.

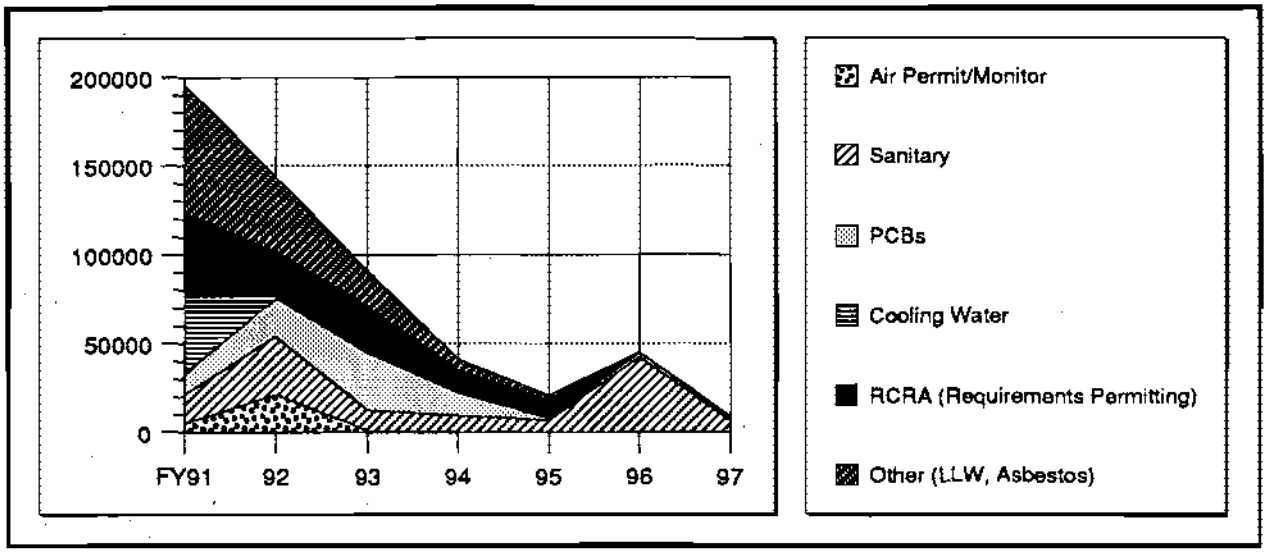


Figure 2.1.1.3b. All currently identified Corrective Activities are completed by the end of FY 1997. (LLW = low-level waste)

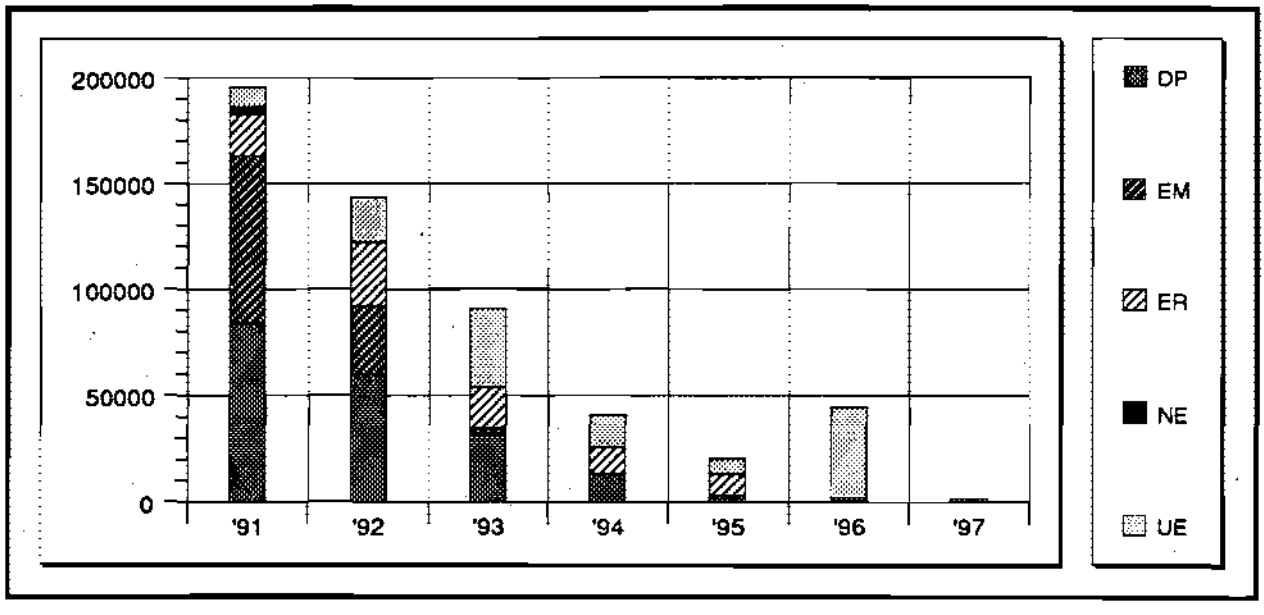


Figure 2.1.1.3c. Funding sources for Corrective Activities are identified by the DOE Program Office. (NE = Nuclear Energy, ER = Energy Research)

2.1.2 HIGHLIGHTS AND ACCOMPLISHMENTS

DOE is on schedule with its goal of rapid closure of Corrective Activities and has produced numerous accomplishments.

Major accomplishments in the past year include:

Albuquerque Field Office

- Sanitary wastewater consolidated system design has been completed at Los Alamos National Laboratory (LANL).
- The design of the RCRA waste staging facility has been initiated at Pantex.
- Pinellas has completed the RCRA permit modification for the upgrade of the liquid waste storage facility. Pinellas has also completed the Title II design for underground storage tank (UST) removal and replacement.
- LANL is continuing its ongoing programs for polychlorinated biphenyls (PCBs) transformer removal and its centralized facility for treating wastewater containing high-explosive residues.

Chicago Field Office

Argonne National Laboratory-East:
- Completed sampling of Freund Pond for characterization of metal contamination.
- Completed preliminary design of the Sanitary Wastewater Treatment Plant improvements.
- Completed final design on the laboratory and Sanitary Sewer Collection System Rehabilitation.

Brookhaven National Laboratory (BNL):
- Completed upgrade to Drum Storage Area.
- Removed and disposed of sludge for seven USTs.

Princeton Plasma Physics Laboratory:
- Completed removal of the five USTs.

Fermi National Accelerator Laboratory:
- Completed leaking underground gas tank cleanup.

Idaho Field Office

- Construction of the Liquid Effluent Treatment and Disposal Facility at the Idaho Chemical Processing Plant will be completed in 1991, and system operation testing will begin later in the year.
- Upgrading of transfer lines and pipes to comply with RCRA secondary containment requirements continues.
- Continuing activities to support RCRA permits and other administrative requirements.
- Continuing activities to comply with the UST regulations, including testing and replacement of regulated tanks.

Nevada Field Office

- Retrofitting of the potable water system to eliminate cross-connections and the

installation of back flow preventers have been initiated.
- The sanitary sewage system modifications have been completed.
- The fencing around one active landfill has been installed.
- The combined Annual Environmental Monitoring Report has been completed.
- The nonradioactive, environmental monitoring program has begun.

Oak Ridge Field Office

Oak Ridge Y-12 Plant:
- Initiated design for the Steam Plant Ash Disposal including a new sanitary landfill for the Oak Ridge Reservation.
- Completed sanitary landfill design and environmental assessment.
- Initiated design for correction of plant drain cross-connects.
- Implemented ash disposal improvements.

Oak Ridge (K-25 Site):
- Completed modification of central neutralization facility to reroute outfall.
- Completed installation of boiler to meet steam requirements and air-pollution regulations (from coal to gas/oil).
- Purchased an additional gas-fired boiler. [After this is installed (early CY 1992), coal-related pollution exceedences should be eliminated at K-25].
- Began upgrade of K-25 Site sanitary and other wastewater collection systems to eliminate National Pollutant Discharge Elimination System noncompliances.

Oak Ridge National Laboratory (ORNL):
- Replaced USTs.
- Completed design for low-level waste (LLW) collection system.
- Began construction of the Bethel Valley LLW collection and transfer system.
- Design and safety documentation for the troughing of the PCB-containing gaskets will be completed, and troughing will continue at an accelerated pace.
- Designs have been completed for the LLW transfer system improvements at ORNL.

Paducah and Portsmouth Gaseous Diffusion Plants:
- Programs are continuing on reducing and eliminating PCBs at the facilities. Troughing and containment of the PCB-containing gaskets has commenced at both plants, and Portsmouth is testing a system for PCB removal from cascade lubricating oil systems.
- Lubricating oil at Portsmouth is being treated, and it is expected that PCB concentrations will be within regulatory limits for all of the oil systems by the end of FY 1991.

Richland Field Office

- Engineering studies have been completed and functional design criteria approved for the Plutonium Finishing Plant's Enclosed Material Handling Facility.
- Submitted RCRA Part B Permit Application for the Plutonium/Uranium Extraction Storage Tunnels.
- Removed leaking and contaminated light ballasts from hot cell facilities.
- Submitted closure plan of 105 DR reactor building to State for approval.
- Drilled 30 RCRA-compliant groundwater monitoring wells plus 4 wells for the Liquid Effluent Retention Facility.
- Air permitting Facility Effluent Monitoring Plans (FEMPs) guidance for the Hanford site has been issued.
- The double shell tank (DST) Management Action Plans were completed and issued. The DST permits are in review. The generic DST Integrity Assessment Plan was completed and approved. The contingency plans were completed for single shell tanks (SST) interim status.

- The Phase I building of the Solid Mixed Waste Storage Facility has been completed and is currently undergoing a readiness review.
- FEMP will be completed in FY 1991.
- The carbon tetrachloride abatement study will be completed in FY 1991.
- Thirty groundwater monitoring wells have been installed.

Rocky Flats Office

- Twenty-five volatile organic compound samplers have been procured.
- Radioactive stack upgrades studies for radionuclides have been initiated.
- Air Pollution Emission Notices have been submitted to the Colorado Department of Health for 48 of the 104 buildings at Rocky Flats.
- The procedure for monitoring beryllium emissions has been modified to adhere to National Emission Standards for Hazardous Air-Polluting Substances and Colorado Air Pollution Control.

San Francisco Field Office (SAN)

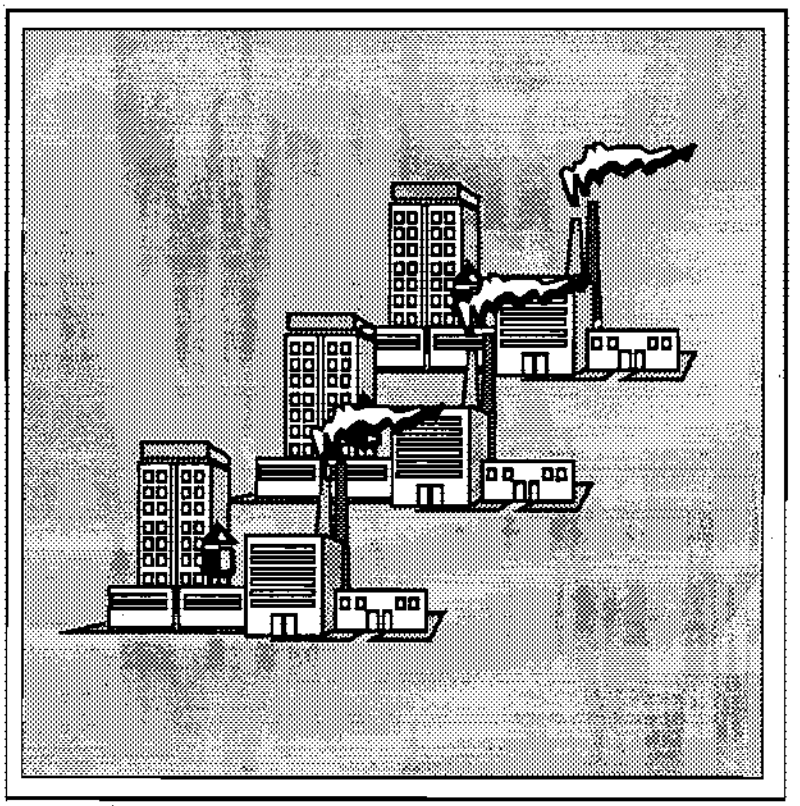
- The upgrade of the sewer alarm system at Lawrence Livermore National Laboratory (LLNL) has been completed.
- The construction of the LLNL sewer diversion system has been completed.
- The high-explosives burn facility has been moved to a new, fully compliant location.
- USTs are being upgraded with secondary containment and leak detection equipment at all SAN facilities.
- Efforts continue on wastewater treatment at the Santa Susana field laboratory. Actual installation is expected to begin this year. Secondary containment will also be provided for all of the chemical storage areas.

Savannah River Field Office

- The only Corrective Activity at SR involves the construction of the cooling tower for the K Reactor. The tower will ensure that the discharge temperature will not exceed 90°F. Foundation work has been completed, and construction of the cooling tower has begun.
- Construction of the cooling tower was accelerated, which will allow early completion and operation of the cooling tower. Construction is now to be complete by March 1992; the tower is to be operational by June 30, 1992.
- Construction began in November 1990 with issuance of a construction permit by the State of South Carolina. The State had allowed some early site clearing work, which met the intent of the Consent Order.
- A Title II cost estimate was completed. The Total Estimated Costs remain at $79 million. All the lump sum contracts have been awarded except for the Distributive Control Systems.
- Testing will be conducted from March through June 1992 prior to operation of the tower.

2.2

Waste Management



2.2.1.1 SCOPE, GOALS, AND OBJECTIVES

Waste Management encompasses ongoing activities throughout DOE's operation complex. Waste Management seeks to manage radioactive, hazardous, mixed, and sanitary wastes from active DOE facilities in a safe and environmentally sound manner and oversees waste minimization efforts throughout DOE.

The scope of the Waste Management Program focuses on the management of the waste generated by DOE's processing, manufacturing, research activities, and site cleanup activities using appropriate treatment, storage, and disposal (TSD) technologies. The program's major goal is to manage waste safely until final disposal is implemented by ensuring that the public, workers, and the environment are protected from the hazards associated with the waste materials; minimization of future waste, conducting all activities in accordance with applicable Federal, State, and local regulations; and complying with the terms and conditions of all compliance agreements. It should be noted here that goals are defined as "long-term" intentions and can involve near-term, long-term, or ongoing activities to support them. Objectives are near-term intentions that support goals.

A major goal of Waste Management is to achieve substantial reductions in both the volume and hazardous constituents of all generated waste. The emphasis of this program is to prevent these materials from entering the waste stream by recycling, substitution, and other source-reduction activities. Waste minimization programs are promoted at all DOE sites through initiatives such as employee training and new procedures. Waste Management is responsible for managing waste minimization efforts within the EM programs and overseeing all waste minimization efforts throughout the DOE operating complex.

Another Waste Management goal is to provide adequate TSD capacity to safely accommodate both currently stored waste and future generated waste. There are many factors which are increasing the complexity for adequate TSD capabilities, including RCRA land disposal restrictions that restrict storage of the hazardous component of radioactive mixed waste, the currently unidentified nature and volume of waste generated by Environmental Restoration cleanup activities, the effect that the Programmatic Environmental Impact Statement may have on activities identified in the Five-Year Plan, the uncertainty associated with the increasingly stringent regulatory requirements, and the increasing scrutiny of DOE activities by external organizations.

Waste Management continues to maintain its level of effort in high-level radioactive waste management. High-level radioactive waste treatment facilities are in various stages of design, construction, and startup. The West Valley Demonstration Project is currently scheduled to begin vitrification activities in September 1996. The Defense Waste Processing Facility (DWPF) at Savannah River is scheduled to begin vitrification activities in FY 1993, and the Hanford Waste Processing Facility, which will use similar

vitrification technology, is scheduled for commencement of hot operations in 1999.

Waste Management goals for handling the transuranic wastes include treatment and storage facilities at Savannah River, Idaho, Oak Ridge, Richland, and Rocky Flats. These goals have been carried forward from previous Five-Year Plans.

Management goals for radioactive mixed waste and/or hazardous waste include incineration facilities at the Waste Experimental Reduction Facility in Idaho, the Toxic Substances Control Act (TSCA) incinerator at Oak Ridge, and the Consolidated Incinerator Facility at Savannah River. These facilities are in various stages of completion. No changes have been made in these goals from previous editions of the Five-Year Plan.

Important Waste Management goals include opening the Waste Isolation Pilot Plant (WIPP) in New Mexico and the mixed, low-level waste disposal facility at the Nevada Test Site (NTS) as soon as possible.

Commencement of the test demonstration phase for WIPP could begin in the summer of 1991. The NTS Disposal Facility is scheduled to begin operations in April 1992.

Also to be considered is DOE's continuing leadership among the international communities in radioactive waste management issues. Increased participation of Waste Management personnel in international meetings, technical symposia, and public discussions will assist other programs in demonstrating the technology leadership role of the United States in this field. Waste Management is also committed to seeking public support to improve its role in the area of educational opportunities. Activities in these areas are currently expanding and will continue to do so as the public learns more about DOE and the educational opportunities it provides. Waste Management objectives in support of the Waste Management goals include initiation of the test phase at WIPP, continued operation of the Waste Experimental Reduction Facility and the calciner at Idaho, the TSCA incinerator at Oak Ridge, and operation of DWPF. These objectives are discussed more thoroughly throughout the remainder of this chapter.

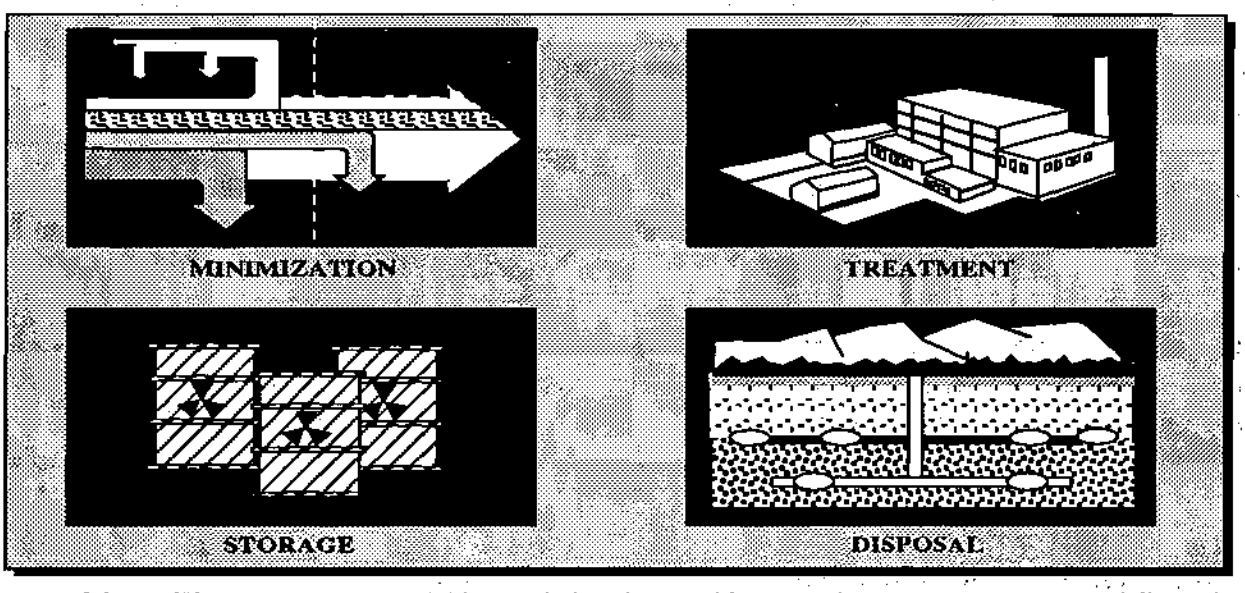


Figure 2.2.1.1. Waste Management activities are designed to provide appropriate treatment, storage, and disposal capabilities and to reduce the amount of future waste requiring management.

2.2.1.2 KEY ISSUES

While the goal of environmentally safe storage, treatment, and disposal of radioactive, hazardous, mixed, and sanitary wastes is clear, its path remains long and challenging.

DOE is challenged to aggressively pursue its waste treatment, storage, and disposal goals while simultaneously ensuring adequate public involvement in the decision-making process. Public involvement is the key to proactively addressing issues. DOE has made efforts to provide the public with adequate information and to hold dialogues on the mission, processes, safety records, environmental compliance, and Tiger Team assessments of its facilities to increase public familiarity with DOE and its operations. Many facilities are open to the public for tours and provide speakers to address the concerns of citizens in surrounding communities.

DOE strategy for addressing challenges to waste treatment, storage, and disposal goals involves both public participation and responsive programmatic initiatives. DOE must address the most pressing programmatic needs and environmental, health, and safety concerns within the constraints of limited budget resources. These fiscal constraints have the potential to cause some slippage of required activities. DOE is developing a Programmatic Environmental Impact Statement, which assesses the environmental impacts of the planned restoration and waste management activities.

The effect of changing missions of DOE facilities has resulted in significant growth in waste management responsibilities. Both the Feed Materials Production Center at Fernald, Ohio, and portions of the Hanford Site have been transferred from a weapons production mission to an environmental restoration mission. These facilities will undergo rigorous cleanup efforts and will ultimately be decontaminated and decommissioned.

Limitations on the interim storage of radioactive and hazardous mixed waste create an untenable situation when waste treatment methodologies may not yet be available to remove hazardous constituents from the waste, nor disposal sites permitted to accept the waste. DOE's plans for waste management include applying effective technologies to the waste storage facilities to bring them into full compliance with environmental regulations, raising safety standards, and retraining personnel to ensure that procedures are followed, regulations complied with, and violations corrected promptly. Use of engineered solutions and complying disposal sites, such as the Waste Isolation Pilot Plant, an experimental transuranic waste repository located in New Mexico, will provide the permanent solution to the waste problem in terms of isolation of

waste from the public and the surrounding environment.

EMs infrastructure addresses past problems and develops effective policy to deal with new issues. Several external constraints, such as regulatory requirements, contribute to additional work load on that infrastructure. DOE continues to work with the EPA, the Department of Transportation, Department of Defense, States hosting DOE facilities, and others to ensure that a cohesive approach to environmental cleanup and waste management efforts is pursued.

States' rights issues, State-imposed restrictions on the interstate transport of waste, and litigation challenges threaten DOE's ability to continue to use current waste treatment, storage, and disposal options. DOE will continue to work cooperatively with State governmental offices, congressional delegations, local communities, and Tribal groups to reach compromise solutions wherever possible. A variety of private initiatives and State/Federal and three-party agreements are being investigated as means of resolving waste treatment, storage, and disposal problems. Alternative strategies may need to be developed, should any of the current implementation strategies fail to achieve desired results. As an example, should the Defense Waste Processing Facility not become operational at Savannah River, additional high-level waste tanks would have to be constructed to maintain its primary mission until alternative treatment facilities become available.

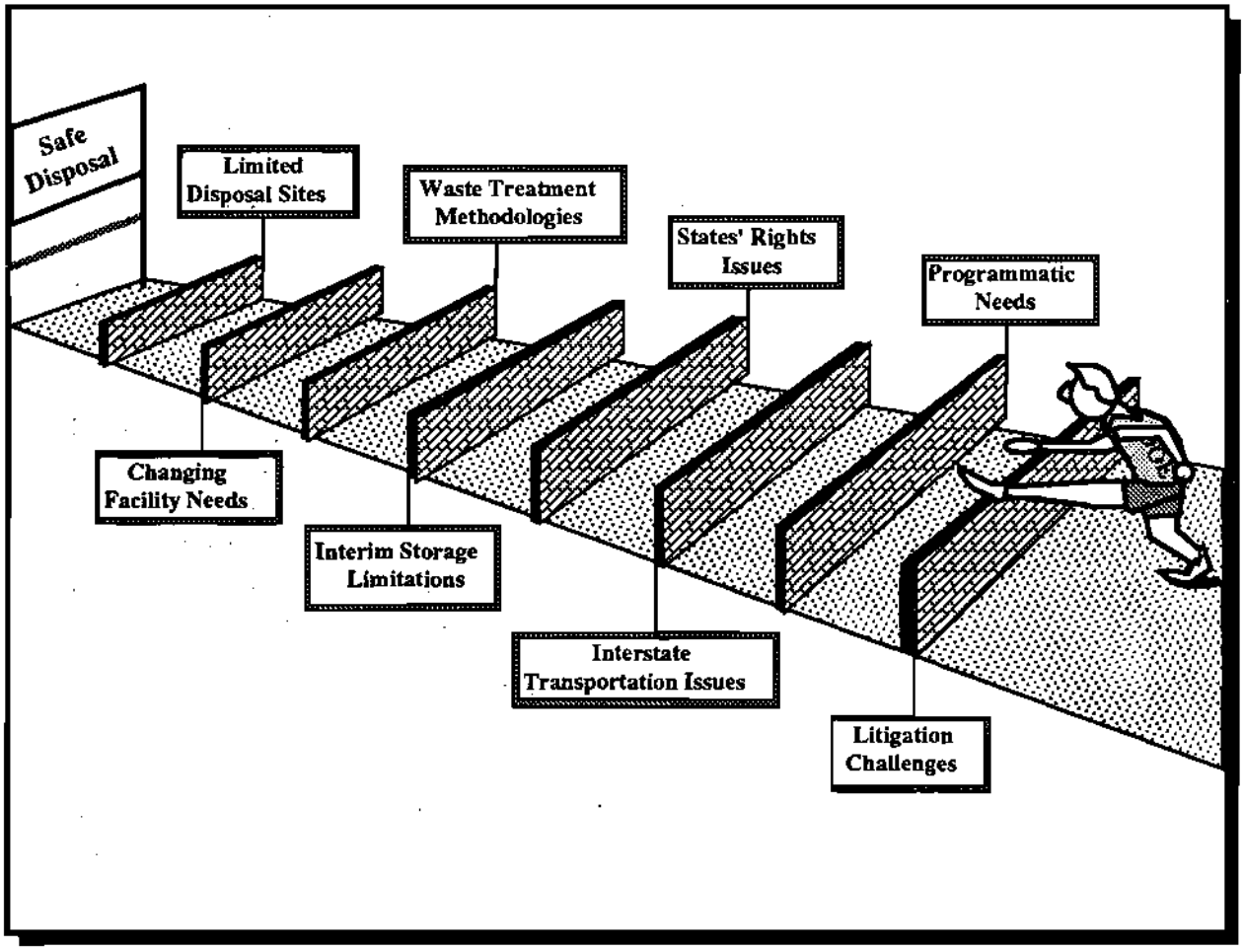
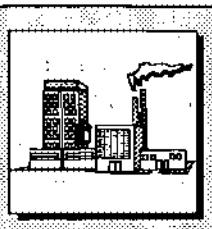


Figure 2.2.1.2. There are many hurdles to clear on the path to safe disposal.

2.2.1.3 WASTE MANAGEMENT COMPLEX CONFIGURATION



DOE is developing and analyzing methods to configure waste management operations to comply fully with environmental laws, regulations, and requirements.

The EM Configuration Study intends to provide alternatives for coordinating all radioactive and mixed waste management activities in DOE. Since the creation of EM in November 1989, all relevant facilities are now joined under one centralized authority. The system that evolved from this action is referred to as the Waste Management Complex (WMC).

Decisions related to the configuration of the WMC are made at the Headquarters level and implemented at the field office level. The EM Configuration Study will provide the process for assessing alternative approaches. The future configuration of the WMC should meet all applicable Federal, State, and local requirements and DOE Orders.

Even though the Programmatic Environmental Impact Statement (PEIS) will be completed 1 year prior to the completion of the Study, the preparatory work for the Study will provide critical input to the EM PEIS. The various configuration alternatives defined in the Study will be assessed in the PEIS. This assessment will involve comparisons of the risks and environmental impacts of the alternatives, from which decisions can be made on the locations for new treatment, storage, and disposal facilities.

Alternatives for more effective and safer ways of managing DOE waste are currently being explored. Aging DOE facilities and the magnitude and complexity of DOE's waste management problems require a systematic approach to the modernization and reconfiguration of sites and facilities. This approach to waste management operations will offer opportunities to evaluate regionalization and other alternatives. EM's ultimate goal is to create a more efficient and effective WMC.

The alternatives for the configuration of the modernized WMC are presented in rather generic terms so as not to prejudice the PEIS by prematurely eliminating any alternatives. The management of a waste stream consists of three generic operations: treatment, storage, and disposal. Each of these operations can be performed in three generic locations: local, regional, or central. The configuration alternative for the WMC consists of combinations of these generic operations and locations.

The three location options require careful definition. Local treatment, storage, or disposal means the specified operation is performed on or near the DOE site where the waste is generated. A regional operation accepts waste from more than one DOE site. Regional operations may be performed at

some larger DOE sites or at nearby commercial sites. Central treatment, storage, or disposal means the specified operation is performed at only one or two sites in the country.

Many distinct alternatives for ownership and operation of WMC facilities are possible (e.g., government-owned contractor-operated and contractor-owned contractor-operated structures). Four strategic management configuration alternatives have thus far been identified in the study; they are the Status Quo, Local Waste Management, Regional Waste Management, and Central Waste Management.

The Configuration Study considers a broad range of technical and institutional issues, including facility sitings, transportation of waste, ownership, and other issues. The option of privatization for several waste management activities is being considered in areas where it is cost-effective. Officials from public, State, and local institutions must be involved in the selection of facility sites and the resolution of transportation issues in order to promote acceptance by community residents. Facilities are required to develop more efficient technologies to monitor hazardous and radioactive mixed waste, thus leading to greater protection for personnel, the public, and the environment.

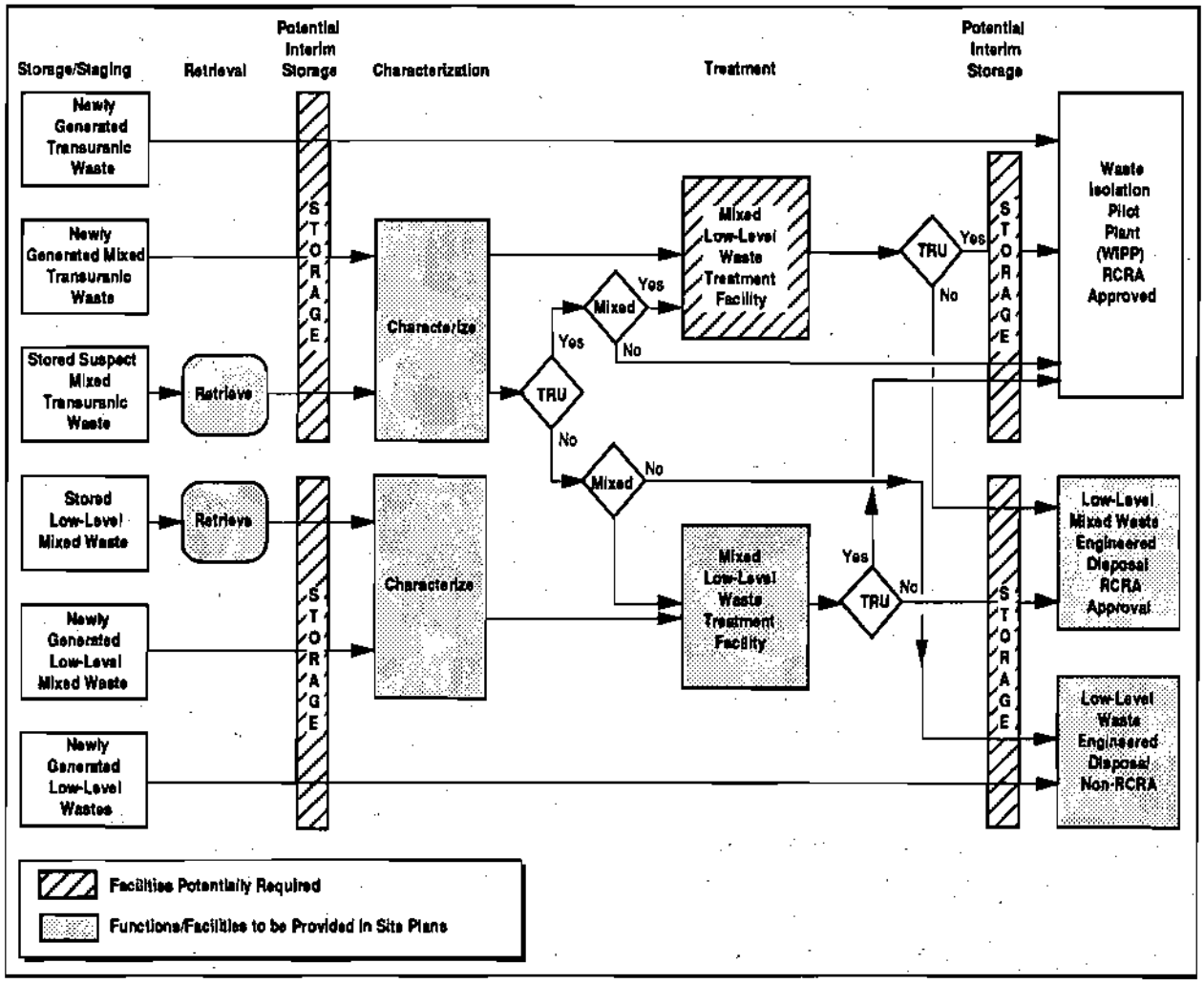


Figure 2.2.1.3. WMC will be configured to receive waste from various sources and treat and dispose of it in proper disposal sites. The Configuration Study is the first step in this planning process. (TRU = transuranic)

2.2.1.4 WORKING WITH THE REGULATORY OVERSIGHT

Waste Management Operations is required to perform many of its activities under external regulatory requirements such as RCRA, CERCLA, the Clean Water Act (CWA), and negotiated agreements with the regulatory community.

The activities of Waste Management Operations are driven by an entire host of external regulations, rules, and laws. Each type of waste (i.e., high-level, transuranic, low-level, hazardous, mixed hazardous, and sanitary wastes) is regulated by different laws. The differences in these laws, rules, and regulations often result in increased efforts in dealing with the regulatory community.

The single most important piece of legislation which affects Waste Management activities is RCRA. RCRA applies to hazardous waste and the hazardous components of mixed waste. Problems associated with establishing and maintaining compliance include the complexity of RCRA rules and their interpretation; unfamiliarity of regulatory personnel with the activities and mission of DOE, and specifically Waste Management; and the Land Disposal Restrictions contained in RCRA. This final issue alone requires Waste Management to spend millions of dollars to achieve compliance. DOE is working closely with the States, EPA, local governments, and other interested groups in resolving issues at specific sites associated with RCRA.

Waste Management activities have long operated under the National Environmental Policy Act (NEPA). NEPA is a mechanism that mandates decisions that may impact the environment and openly affect activities of concern to interested groups. Since considerable interest in all of DOE's activities by the regulatory community and the general public exists, this process can be time consuming. However, implementation of NEPA requirements, which identifies alternative and preferred actions, can reduce delays of necessary projects.

The recently reauthorized Clean Air Act is a law that underwent considerable revision and interpretation. Follow-up rules and regulations are only now being promulgated. Since these rules are still in their infancy, there are concerns of how this legislation will affect Waste Management activities.

CWA has a significant effect on Waste Management activities. New initiatives in stormwater control may have significant impact on Waste Management activities. CWA is the major driving legislation on sanitary sewage systems. It is the intention of Waste Management to begin management of these systems as treatment and disposal units. Due to the deteriorating condition of the sewer systems at many facilities, there may be significant costs associated with upgrading the sewers. The uncertainty associated with these costs may become a major problem associated with compliance with this law.

Internal DOE Orders, such as DOE Order 5820.2A, regulate activities associated with managing radioactive waste. In an effort to achieve compliance quickly and be fully informed concerning environmental regulations, DOE management has imposed numerous reporting and related orders. Although these efforts are stringent and often time-consuming, they do reflect DOE's commitment to achieving and maintaining compliance.

A major driving force in Waste Management activities includes compliance agreements, which are a result of negotiated settlements or consent orders. DOE's eagerness to reach compliance quickly led to commitment to overly optimistic schedules and activities, which were expanded beyond planned resources. Maintaining compliance with these agreements is resource-intensive and remains a high priority in Waste Management. Further compliance agreements are under negotiation.

Many other laws, such as the Toxic Substances Control Act; the Occupational Safety and Health Act, which applies to our Management and Operating Contractors; and State laws, have significant impact on Waste Management Operations. Major funding efforts are in place at some sites to achieve and maintain compliance with these laws.

As can be discerned from this discussion, a proactive management position has not yet been attained for dealing with all of these laws and regulations. It is anticipated that as the staff matures, a more proactive position will be able to be taken.

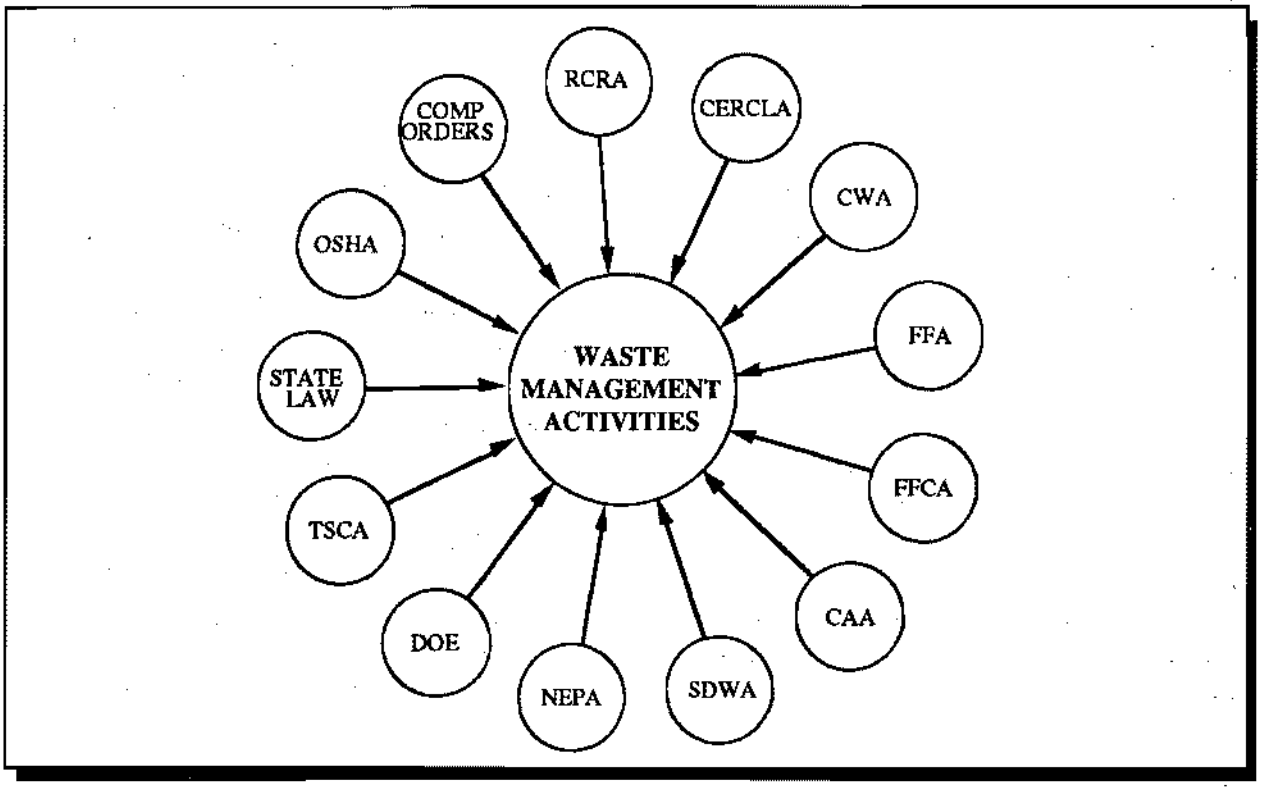


Figure 2.2.1.4. Waste Management Activities are impacted by a large number of internal and external factors. (FFA = Federal Facility Agreement, FFCA = Federal Facility Compliance Agreement, CAA = Clean Air Act, SDWA = Safe Drinking Water Act, TSCA = Toxic Substances Control Act, OSHA = Occupational Safety and Health Administration, COMP = Compliance)

2.2.1.5 PLANNING ASSUMPTIONS

The plan for Waste Management activities identifies two funding levels, the Preliminary Unvalidated Case and the Validated Target Level.

The Preliminary Unvalidated Case (PUC) represents a preliminary estimate of funding: to ensure protection of the public and worker health and safety, to carry out the agreements entered into by DOE, to ensure compliance with applicable environmental requirements, and to implement other desired improvements. The PUC presents the upper limits or "ceiling" of what Waste Operations management believes it can manage. It is assumed that DOE will not receive all the funds that it has identified in the higher level.

The Validated Target Level (VTL) provides a 10 percent annual increase for the defense-related EM program. The program grows at 10 percent per year even in the context of declining statutory caps for the overall defense category which were insisted upon by Congress. Neither the PUC nor the VTL necessarily reflects the actual amount of money that will be allocated to the EM Program between FY 1993 and FY 1997. Actual funding will depend upon further priority setting in the context of the annual budget and appropriations process.

Resource constraints includes the work force needed to complete the Waste Management mission. An assumption of the Five-Year Plan is that the work force pool has a finite limit. Only a limited number of technical, professional, and managerial persons are capable of implementing and executing this program. These personnel are in high demand from DOE, DOE contractors, private industry, and other Federal agencies experiencing similar problems. As a result, it is difficult for DOE to compete for qualified personnel, and DOE assumes that as demands from regulators continue to grow, the competition will increase.

In preparing this Plan, Waste Management staff have made several general assumptions broadly affecting this planning process. Among these assumptions are: (1) the Defense Waste Processing Facility at Savannah River will soon be operational, (2) the Waste Isolation Pilot Plant in New Mexico will open this year for a 5-year test phase, (3) the Programmatic Environmental Impact Statement will not identify any unexpected issues that could impact implementation of Waste Management Programs, (4) DOE Waste Management and EPA will reach an agreement concerning the Land Disposal Restrictions contained in RCRA, and (5) no major malfunctions will occur within the complex that will cause extended interruptions to the Waste Management mission.

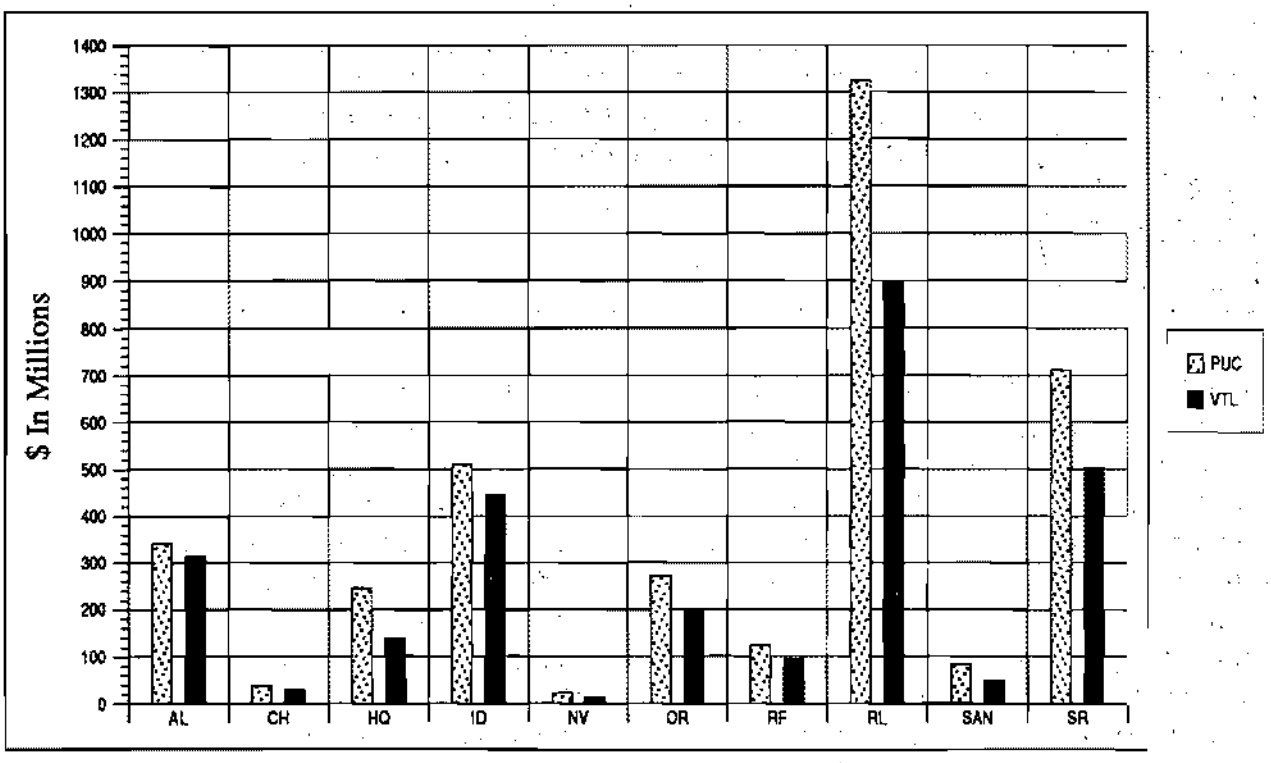


Figure 2.2.1.5. Waste Management funding by field office, PUC and VTL. (PUC = Preliminary Unvalidated Case, VTL = Validated Target Level, AL = Albuquerque, CH = Chicago, HQ = Headquarters, ID = Idaho, NV = Nevada, OR = Oak Ridge, RF = Rocky Flats, RL = Richland, SAN = San Francisco, SR = Savannah River)

2.2.1.6 RESOURCE REQUIREMENTS

Waste Management funding must increase during the planning period since construction is nearing completion and operations will subsequently be upgraded. Completion of these activities indicates to external groups, such as the regulatory community and public interest groups, that operations are safe and environmentally sound.

The Five-Year Plan identifies a steady increase in funding requirements. However, the rate of growth cannot exceed DOE's ability to manage resources effectively. As was stated in the FY 1992-1996 Five-Year Plan, DOE, industry, and the regulatory community will be challenged to effectively manage resources and yet comply with every applicable law, rule, regulation, guidance, order, and agreement.

Increases in Waste Management costs are, in part, due to the construction and/or installation of treatment, storage, and disposal facilities. For example, the West Valley Demonstration Project anticipates an increase in its funding from $79 million in FY 1991 to $124 million in FY 1993. Similar increases in funding are expected throughout the complex as construction activities begin. These construction activities are needed to develop adequate treatment and disposal capability, which demonstrates DOE's intent to effectively manage its wastes in a safe and environmentally sound manner.

Similarly, funding is needed to work off the backlog of waste that has accumulated over 40 years of operating under less stringent environmental standards. The activities needed to work off this backlog will be planned, constructed, and implemented with careful consideration. Waste Management is trying to allocate limited resources in the most effective manner possible.

The rate of growth is difficult to manage since most Waste Management activities are externally driven. As external regulatory requirements become more stringent and the regulatory community demands more of Waste Management, costs are going to increase.

An expanded prioritization system has been put in place to aid in allocating funds that Waste Management receives. The previous year's four-tier categorical prioritization system has been further divided into subcategories to further delineate the requirements which drive the activity. These designations identify, for example, whether the activity is needed to prevent criminal or civil penalties or to accelerate a schedule to complete an activity ahead of a required deadline. Obviously, acceleration of a schedule is of lower priority when so many activities need to be completed just to achieve compliance.

Management and staff personnel resources are limited by the available talent pool. DOE and its contractors hire employees from the same finite talent pool. Currently, large numbers of highly qualified personnel are needed by DOE and its contractors. DOE and its contractors are having

difficulty providing these persons. As a result, the lack of qualified personnel challenges DOE to provide the human resources necessary to effectively manage large increases in funding. One way DOE is addressing the problem is through expanded support in education and training in order to obtain the required expertise.

Validated Target Level

Fiscal Year
(Thousands of Dollars)

	1991	1992	1993	1994	1995	1996	1997
Albuquerque Field Office	231,542	258,961	312,692	348,690	405,907	444,865	453,807
Chicago Field Office	15,254	16,363	28,257	36,894	37,426	42,673	42,339
Headquarters	58,475	143,147	139,687	226,547	312,014	286,452	435,771
Idaho Field Office	313,207	352,197	444,041	477,550	514,894	536,028	556,874
Nevada Field Office	9,506	13,819	14,410	19,773	20,248	22,266	24,485
Oak Ridge Field Office	148,569	236,701	265,484	328,065	340,637	350,130	337,054
Richland Field Office	643,539	763,785	900,567	911,781	986,526	1,149,346	1,262,181
Rocky Flats Office	89,904	95,041	94,108	106,570	117,503	129,253	142,178
San Francisco Field Office	17,263	35,528	42,501	55,321	52,695	81,705	50,029
Savannah River Field Office	508,536	491,325	502,301	541,002	567,487	612,220	668,793
Total	2,035,795	2,406,867	2,744,048	3,070,193	3,355,337	3,654,938	3,973,510

Figure 2.2.1.6. Sharp increases in funding are expected to continue. Outyear funding is expected to level off as current construction projects are completed.

2.2.1.7 LESSONS LEARNED FROM INDEPENDENT COST REVIEWS

Independent Cost Reviews (ICRs) conducted by the Waste Operations Program for this Plan gave a better understanding of the realism and accuracy of the current estimates and schedules.

As the EM program matures, increased realism and accuracy of cost and schedule estimates will be required to properly manage the program. The Headquarters guidance package for this Plan set a target of reviewing 70 percent of the aggregate cost by program area at each installation. Accordingly, the Waste Operations Program conducted ICRs of over 220 Activity Data Sheets (ADSs). Candidates for review were chosen on the basis of prioritization, size of funding requirement, cost and schedule risk, sensitivity, and/or complexity.

Objectives: The Waste Operations Program ICRs were conducted as part of a waste operations cost improvement program initiated in 1990. The review process enabled Headquarters to develop a detailed understanding of the challenges and risks facing the Waste Operations Program. A significant benefit of this effort is that it enables the waste operations organization to provide informed leadership in the achievement of cost reductions by identifying areas with the greatest potential for improvement and participating in the achievement of those reductions.

Specific objectives for the FY 1993-1997 reviews were for each ADS reviewed to assess the documentation and traceability of the estimate, identify the basis of the estimate, and explore areas for cost improvement. The target of reviewing 70 percent of the dollar value of the Waste Operations Program at each field and area office was achieved in all of the field and area offices.

The Process: The FY 1993 reviews were planned and scheduled by the Waste Operations Division of Program Support. The reviews were conducted with the field offices by teams consisting of the Headquarters program manager, a trained cost analyst/estimator, and technical support personnel. Independence was achieved by ensuring that team members had no involvement in the preparation of the original estimates. Twelve waste operations teams were assembled and trained to ensure that a consistent approach was taken.

Prior to the review, the team leader organized the field visits for his team, while his team reviewed the applicable ADSs and other background material. The fixed agenda for each review called for a Headquarters Review Team Overview Presentation, followed by a field office presentation on their cost and schedule estimating process. These presentations covered topics such as current written guidance, description capabilities of groups developing cost estimates, sources of information, descriptions of current cost and schedule control systems, summaries of

procedures, and future plans. Three to four days of detailed reviews followed these presentations.

A checklist was completed for each ADS reviewed, documenting results in each of the three objective areas. Reviews of estimate documentation and traceability focused on factors such as the use of a Work Breakdown Structure, schedule realism, and contingency analysis. The degree of estimate detail was determined as part of the basis of estimate and led to the determination of overall estimate accuracy. Although it worked well for line items, this year's checklist was not very effective for reviewing Waste Operations operating activities. It will be revised for next year's reviews.

Field offices were given an exit briefing by the review team upon departure, and a written report was prepared and circulated within the ICR team. When complete, the report was forwarded to the field so that the comments could be incorporated into the Validated Target Level ADS submittal. A comprehensive report and executive summary were subsequently prepared at Headquarters.

Lessons Learned: In addition to results incorporated into specific ADSs, the Waste Operations Program learned a number of general lessons from the ICR process. Although cost estimate quality and detail varied considerably among and within sites, many findings were common to all.

Schedules and estimates are closely integrated: Many activities are schedule driven, and cost improvement opportunities are often linked to schedule improvement.

Focused policies, procedures, and guidance will improve consistency, accuracy, and traceability: Improved guidance, issued as early as possible and remaining stable throughout the budget process, will assist the field offices in improving the quality of their cost and schedule estimates.

Estimate documentation and traceability offer areas for improvement: Areas for improvement include documentation for indirect rates, cost backup for outyear operating expenses, assumptions for postmilestone periods, and approaches to contingencies. Detailed, documented estimates were available for most of the line item projects.

In some cases, the basis for estimates need to be supported by additional analysis: Many of the outyear activities are based on forecasted changes in regulations and agreements. These assumptions, in general, need to be supported by more detailed analysis. Some ADS consolidation and recombination is still occurring, and this causes some difficulty in assessing the basis for estimates.

Areas for Cost Improvement: Coordination of activities across the site (such as well drilling operations, waste disposal options, and equipment/personnel needs) could lead to cost reductions. The reviews identified many opportunities for cost improvement ranging from policy actions (such as reducing indirect costs) to cost engineering actions (such as elimination of double counting). Many of these improvements have been incorporated this year. Additional, long-term improvements will be realized in future years.

2.2.1.8 WASTE OPERATIONS PRIORITIZATION SYSTEM

The Office of Waste Operations is moving forward to develop an analytical model to assist in the prioritization of waste management activities.

The Office of Waste Operations conducts over 1,000 activities, described in Activity Data Sheets (ADSs), that compete for funding. A need has been identified to develop an analytical model to assist decision makers in distributing limited funds among the activities.

This need was recognized during the preparation for the 1990 version of the Five-Year Plan (1992-1996). For that Plan a simple categorical model was developed and implemented to apply priorities to the activities. That four-category model was found to be insufficient for the purpose of differentiating between the large number of waste management activities. After the publication of the 1990 Plan, work began on efforts to provide an improved model.

For the 1991 Plan, it was decided to expand the four-category model by subdividing each category into three subcategories. This produced a prioritization model with 12 subcategories (Table 2.2.1.8). This refinement produced some improvement in the ability to differentiate among competing activities. In general, Category 1 activities were considered to be more important than Category 2 activities, etc. Likewise, within a given category, Subcategory A activities were considered to be more important than Subcategory B activities, etc. It should be noted, however, that all categories and subcategories were expected to receive some funding. The activities with the higher rankings were expected to have a higher probability of being fully funded.

Concurrent with the development of the expanded categorical model for use in the 1991 Five-Year Plan, studies have been under way to establish the requirements of an improved analytic model for assisting in the prioritization of activities. This work has included investigations of the need for a Waste Operations prioritization model, the proposed scope of such a model, the type of model most suitable to the Waste Operations situation, and the preferred mechanisms for gaining input from interested parties in the development of the model. A schedule is currently being developed that establishes dates for key milestones in the investigation/development process, including dates for public input, model selection and development, pilot testing, and full-scale implementation.

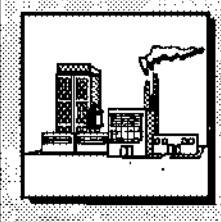
Throughout the investigation process Waste Operations has been and will continue to be in constant contact with other EM offices to apply lessons learned during the development of their systems and to address questions of compatibility that could adversely impact any future development of

an EM-wide prioritization model. The Environmental Restoration prioritization model (Section 2.3.1.3.4) has been especially useful in this regard.

Table 2.2.1.8. Subdivision of four category model

	Subcategory		
Category	A	B	C
1	Provides safe operation	Prevents potential releases to the environment	Maintains ongoing activities
2	Complies with agreement provisions that have criminal or civil liability penalties	Complies with agreement provisions that have administrative penalties	Complies with other agreement provisions
3	Complies with regulations and DOE regulatory standards	Maintains supporting activities	Provides for long-term mission continuation and cost benefits
4	Provides supplementary environmental, safety, and health improvements	Improves other practices	Accelerates schedules

2.2.1.9 RELATED ACTIVITIES MANAGED BY OTHER DOE PROGRAM OFFICES



The other DOE Program Offices have management responsibility and provide funding for activities related to the management of their waste.

In the management of waste from "cradle to grave," it is important to remember that the initial portions of this management system are outside the direct line responsibility of the Office of Environmental Restoration and Waste Management (EM). These initial activities are managed by the generator and include characterization, packaging, and labeling of the waste. In some instances, these activities include satellite accumulation areas and transportation of the waste to EM managed facilities.

Waste generators include the Offices of Defense Programs, Nuclear Energy and Energy Research. These Offices are responsible for providing the resources necessary to characterize, package, and label the waste in an acceptable form for management by EM and the Office of Waste Operations. EM is also a waste generator and is responsible for the performance of these activities for the waste it generates.

Characterization activities are those which identify what constitutes a particular waste. Characterization may be performed by chemical analysis, physical observation, process knowledge and/or radiological monitoring. Using these techniques, a generator may determine whether a waste is high level or low level radioactive, hazardous or nonhazardous, liquid or solid waste. This characterization will assist the generator and EM in treatment, storage and disposal of the waste.

Based upon the characterization of the waste, appropriate packaging occurs. Hazardous waste will be packaged to meet RCRA requirements and may include drumming of the waste or other applicable and appropriate packaging. Characterization and packaging activities are significant fractions in the total management cost of the waste.

Finally, once the waste is appropriately packaged, it must be labeled. Labeling occurs to identify the package contents and to meet the requirements of the Department of Transportation and RCRA. For hazardous waste, manifests must also be prepared to meet RCRA requirements and to identify the nature of the waste so that it may be properly tracked through the system to disposal.

In some cases, satellite and 90 day accumulation areas are operated by the generators to hold waste until sufficient quantities are amassed to permit economical transport of the waste to an EM operated facility. The 90 day facilities must have adequate spill protection, containment and other features to meet RCRA requirements.

In some cases, the generator pays for transportation of the waste to an EM managed facility. In other cases, EM pays for these

transportation costs. EM is working with the other generators to develop a standardized policy on transportation of waste so that this activity is properly budgeted and planned.

Making generators responsible for a portion of the costs encourages waste minimization. Not only is waste minimization required by RCRA for hazardous waste, but it is DOE's policy to reduce the volume and toxicity of waste generated. This reduces the amount of waste disposed and reduces costs to the generator. Therefore, the generator has a real incentive to minimize waste.

There has been some confusion over which activities should be funded by the generator and which should be funded by EM. As a result, EM and other Program Office personnel are reviewing budget support documents to assure that activities are properly placed in the appropriate budgets. There were twenty-seven Activity Data Sheets (ADSs) submitted as part of the back-up material for this year's Plan which were transferred to other Program Offices for inclusion in their budgets. Twenty-two ADSs, totalling approximatelely $50 million for FY 1993, were transferred to the Office of Defense Programs and five ADSs, totalling approximately $4 million for FY 1993, were transferred to the Office of Energy Research. Where activities are found to be improperly placed, the activity and budget target will be corrected.

The duties and responsibilities of the various Program Offices relating environmental management at DOE facilities are defined in a Memorandum of Agreement signed September 19, 1989. From time to time, refinements occur to this agreement, as would naturally occur to any "living document." Revisions or changes in interpretation of this agreement will be addressed in future editions of the Five-Year Plan.

Funding by Program
Validated Target Level
(Dollars In Thousands)

	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997
Defense							
Corrective Activities							
DP	$ 84,090	$ 59,947	$ 32,086	$ 13,201	$ 2,932	$ 2,254	$ 1,938
EM	78,947	32,588	2,959	583	0	0	0
Total	163,037	92,535	35,045	13,784	2,932	2,254	1,938
Waste Management							
DP	47,282	232,845	222,897	211,816	177,206	174,417	167,427
EM	1,715,855	1,865,536	2,156,026	2,407,744	2,747,181	3,024,417	3,381,497
Total	1,763,137	2,098,381	2,378,923	2,619,560	2,924,387	3,198,834	3,548,924
Non-Defense							
Corrective Activities							
ER	19,308	29,281	18,440	12,000	10,482	0	0
NE	4,087	554	247	0	0	0	0
UE	9,250	21,084	36,926	15,225	7,300	42,200	6,700
Total	32,645	50,919	55,613	27,225	17,782	42,200	6,700
Waste Management							
ER	14,524	22,964	36,285	45,018	47,329	58,741	64,927
NE	89,596	13,704	9,649	7,562	7,905	7,771	7,788
UE	14,759	54,263	63,246	102,679	100,204	114,254	57,516
EM	92,040	130,859	153,345	167,520	164,571	170,340	177,429
Total	210,919	221,790	262,525	322,779	320,009	351,106	307,660

Figure 2.2.1.9. Some activities identified in the Plan are the management responsibility of other DOE program offices. This table identifies the dollar amounts associated with each program office.

2.2.2 HIGHLIGHTS/ACCOMPLISHMENTS

The Waste Management Program has completed several key accomplishments in the past year.

The activities of the Waste Operations Program indicate that significant progress is being made toward improved waste management. The following summary demonstrates that a wide variety of activities is occurring concurrently and is reflective of the different circumstances at each of the sites. This summary is intended to be a brief summary of the many activities which are occurring. A more detailed summary may be found in Section 3, the Installation Summaries.

The Remedial Feasibility Investigation plan was completed for the Pinellas Plant, and the actual fieldwork has begun. In this phase, which is required by RCRA, Pinellas Plant personnel, along with the Albuquerque Field Office staff, will develop alternatives for managing these sites. This is an important step in resolving problems at these sites and is needed to characterize the unresolved problems.

The automatic flow diversion structure and the detector station at Brookhaven National Laboratories (BNL) have been completed. These two units help ensure that there are no releases to the environment through unintentional spills or accidents. The flow diversion structure automatically diverts sewage flows that could upset the treatment plant to lined holding ponds for further treatment, and the detector station monitors shipments from BNL to the municipal landfill to ensure that no radioactive materials are contained in the shipments.

At the Idaho Chemical Processing Plant, the New Waste Calcining Facility was restarted in December 1990. The calciner converts high-level liquid waste into calcine, a more stable form for storage. This is a major accomplishment, and about 150,000 gallons of waste have already been calcined during this campaign.

The construction of the centralized waste accumulation pad at Nevada was completed. This construction will assist DOE in storing wastes in compliance with RCRA requirements.

At Oak Ridge, the construction of Tumulus II at Oak Ridge National Laboratory was completed and will provide disposal capacity for low-level waste (LLW) in compliance with applicable standards. Also, the Toxic Substances Control Act incinerator at the Oak Ridge K-25 Site began operation—another major achievement by DOE in putting treatment, storage, and disposal facilities on-line to manage its wastes. This unit has already processed over 1 million lb of waste.

At Richland, construction of the 242-A evaporator liquid effluent retention facility

and other upgrades to the evaporator itself have begun. Performance specifications for the 200 Area liquid effluent treatment facility were completed, and those of the 300 Area treated effluent disposal facility were started. These improvements will upgrade the capability of the evaporator and enhance the sites environmental compliance capability. Also, at Richland, interim stabilization of an additional four single-shell tanks was accomplished, thus increasing the safety of these tanks.

The construction of the Transuranic Package Transporter II loading facility at Rocky Flats is nearly completed. This facility will allow safer and more efficient handling of transuranic waste. Also, the construction of the improvements to the sewage treatment plant continues. These improvements will allow the sewage treatment plant to produce an effluent which meets the requirements of the Clean Water Act.

At San Francisco, all known, leaking equipment that contained polychlorinated biphenyls (PCBs) has been removed, and removal has begun on out-of-service, nonleaking equipment that contains PCBs. Removal of this equipment at the Lawrence Livermore National Laboratory will prevent the contamination of soils with PCBs.

At Savannah River, the Defense Waste Processing Facility began cold test operations. Saltstone operations began in June 1990. This unit processes LLW with concrete to turn the waste into grout, which is disposed of in vaults. The unit is designed to dispose of about 6 million gallons of LLW per year.

Finally, the Waste Isolation Pilot Plant (WIPP) received approval of its no-migration variance petition from EPA. This is an important step in preparing WIPP for the test operation phase.

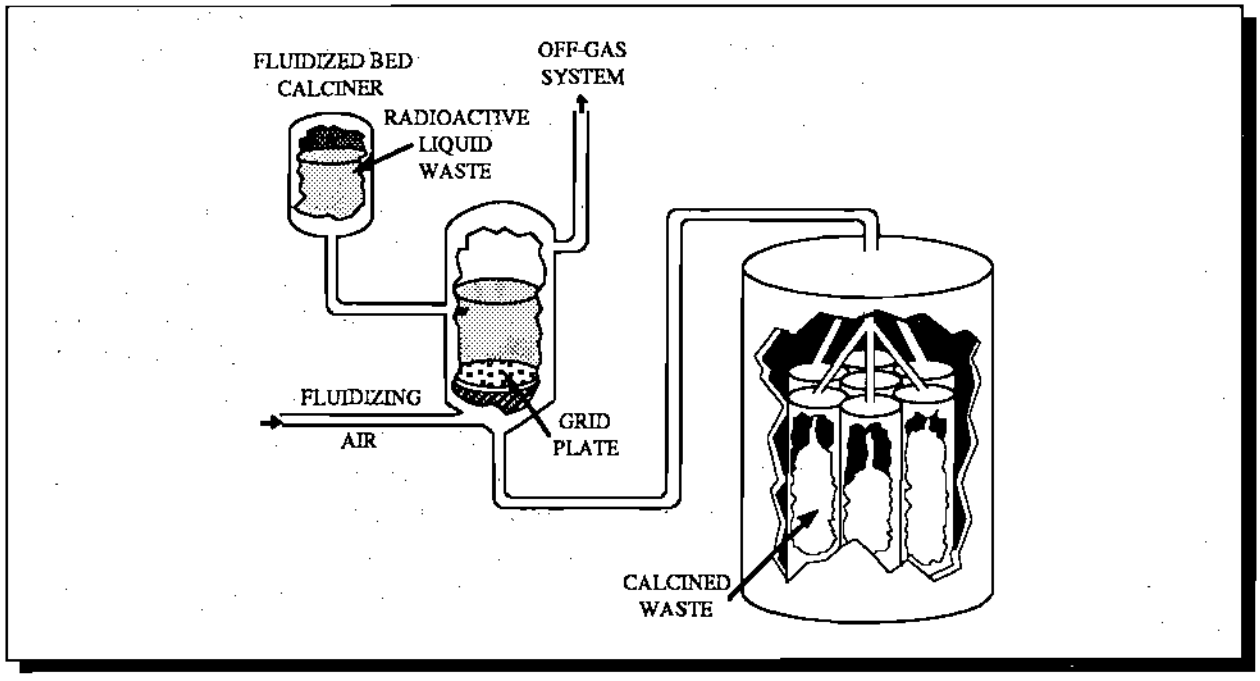
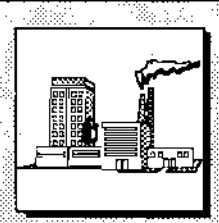


Figure 2.2.2. A simplified schematic of the New Waste Calcining Facility demonstrates how it converts high-level liquid waste into calcine. This system was restarted in December 1990 and is scheduled to calcine about 800,000 gallons of high-level liquid waste.

2.2.3.1 HIGH-LEVEL WASTE PROGRAM



EM is committed to the successful development, demonstration, and deployment of treatment technologies to produce acceptable waste forms for disposal of high-level waste (HLW) in a deep-mined geological repository.

HLW is generated by DOE's activities of producing strategic nuclear materials for national defense. Most of the U.S. inventory of HLW resulting from such activities is stored at the Savannah River Site (SRS), Idaho National Engineering Laboratory (INEL), and the Hanford Site. A small amount of HLW was generated in commercial activities at the Nuclear Fuel Services Plant, now referred to as the West Valley Demonstration Project (WVDP), near West Valley, New York. Solidification of the HLW at this site is DOE's responsibility.

About 381,000 m^3 of HLW containing approximately 1.1 billion curies of radionuclides is currently stored at the four locations (Figures 2.2.3.1a and 2.2.3.1b). At SRS and the Hanford Site, HLW is stored in underground tanks in the form of alkaline liquid, sludge, salt cake, and (at the Hanford Site only) slurry. At INEL, HLW is stored in the form of liquid in underground tanks and calcine (a granular solid) in steel bins housed in concrete vaults. At WVDP, HLW is stored in two underground tanks; one contains alkaline waste in liquid and sludge form, and the other contains acidic waste.

With the exception of the calcine waste at INEL, none of the large volume of HLW currently in underground storage tanks is in a stable solid form. Careful management of these storage tanks is required to ensure continued safety. See Section 2.2.3.1.1 for further discussion of tank safety issues.

Under the authority of the Nuclear Waste Policy Act of 1982, President Reagan determined that DOE's HLW shall be disposed of in a deep geologic repository licensed by the U.S. Nuclear Regulatory Commission (NRC). NRC regulations require that, to be suitable for disposal in a repository, HLW must be in the form of a durable, stable solid. It is this requirement which gave rise to the investigation and evaluation of various HLW treatment technologies culminating in the selection of vitrification as the treatment technology best suited to the majority of DOE's HLW. (The treatment process for the calcine and liquid wastes at INEL is still undetermined. A possible treatment, the glass/ceramic waste form, is under investigation.) See Section 2.2.3.1.2 for a discussion of DOE's program for vitrification of HLW.

Not all of the contents of the waste now in storage in tanks at SRS, WVDP, or the Hanford Site will be vitrified. EM will pretreat the stored HLW in order to concentrate all but a small amount of the radioactivity into a fraction (roughly 10 percent) of the current volume of stored waste. This high-activity fraction will undergo the vitrification process and remain

temporarily in storage. Later, it will be shipped to the repository for final disposal. As a result of the pretreatment process, the greater volume of stored HLW will be rendered low-level. As such, its disposal can be accomplished employing conventional treatment technologies such as immobilization in grout or cement. See Section 2.2.3.4.1 for discussion of low-level waste treatment technologies and Figure 2.2.3.1c for a pictorial representation of DOE's HLW treatment system.

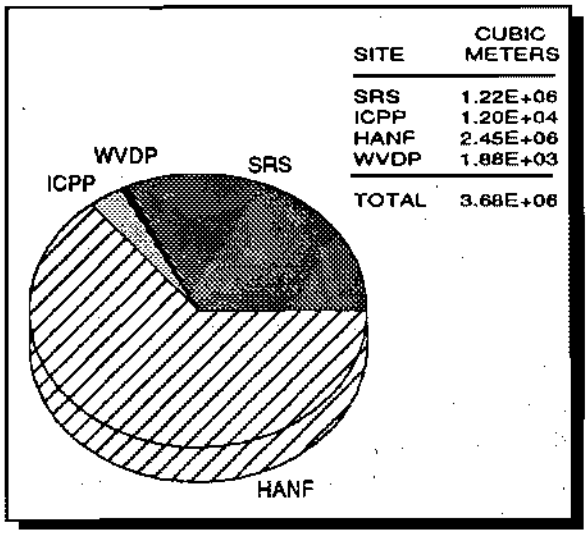


Figure 2.2.3.1a. Total volume of HLW by site. (HANF = Hanford Site, ICPP = Idaho Chemical Processing Plant)

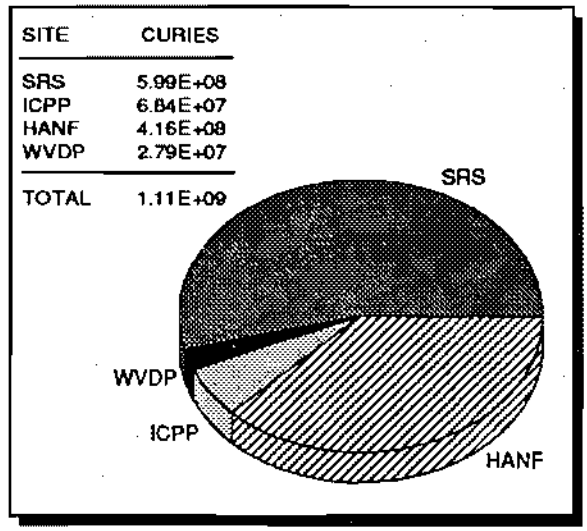


Figure 2.2.3.1b. Total radioactivity of HLW by site.

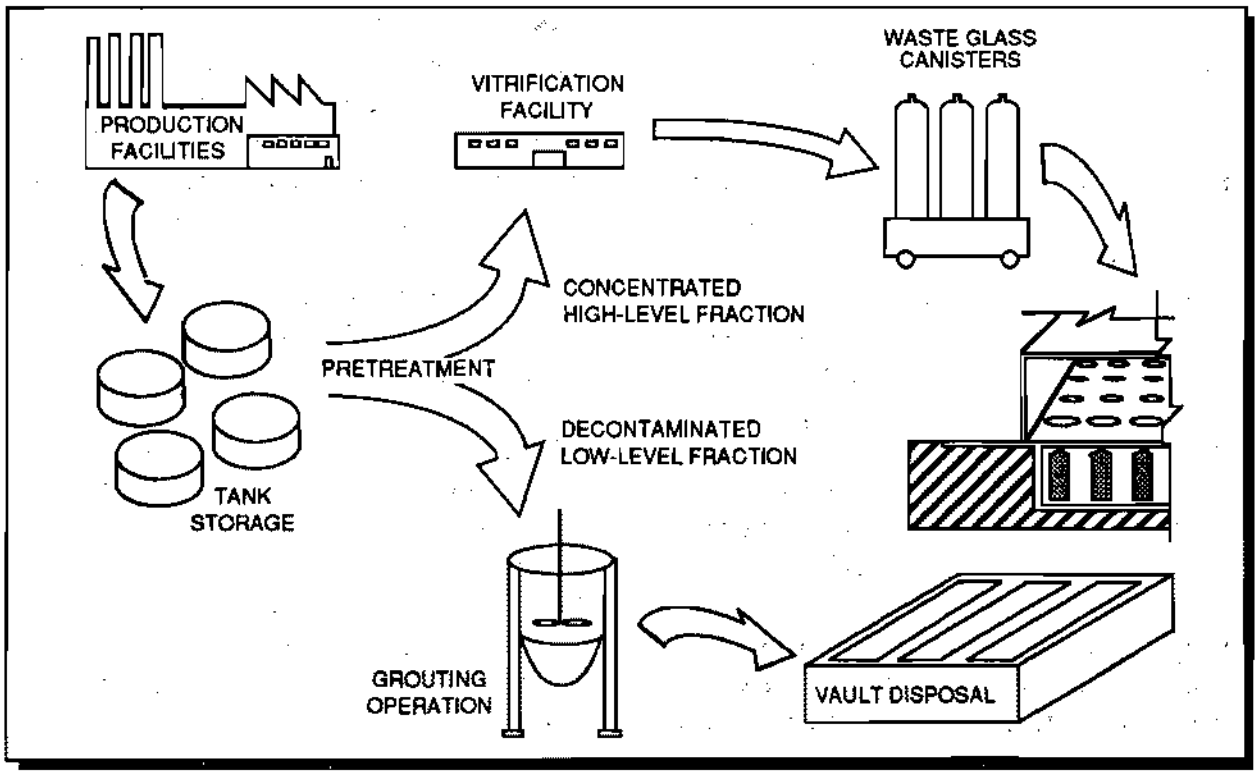


Figure 2.2.3.1c. Waste management system for vitrification of HLW.

2.2.3.1.1 TANK SAFETY

Questions have been raised regarding the safety of several high-level waste (HLW) storage tanks at DOE sites. DOE is committed to taking all necessary actions to ensure safe operations of its HLW tanks now and in the future.

Currently, approximately 381,000 m^3 of HLW containing about 1.1 billion curies of radionuclides is stored at four DOE sites: Savannah River Site, Idaho National Engineering Laboratory, Hanford Site, and West Valley Demonstration Project. The sites generating the HLW treat the waste for interim storage. The resulting sludges, precipitated salts, and concentrated salt solutions are stored in tanks until the waste can be pretreated and converted to a form (glass or ceramic) suitable for disposal in a Federal repository.

DOE has identified the following HLW tank safety issues at the Hanford Site, which had not been adequately evaluated through the safety analysis procedures: the generation of large quantities of flammable hydrogen gas and the potential for explosion of the ferrocyanide compounds in the waste. Other potential safety issues at the four sites include corrosion of storage tanks, seismic stability, and the presence of reactive organic compounds.

Although the risk posed by these safety issues is believed to be low, the uncertainty in the risk estimates of these facilities is not acceptable. To address safety issues, DOE is establishing a complexwide program to systematically and comprehensively identify, evaluate, and resolve all potential HLW tank safety issues. To preclude the occurrence of safety issues in the future, DOE will review and revise safety and operational components of its HLW tank program.

Due to the potential consequences of a hydrogen gas or ferrocyanide accident, DOE has made evaluation and resolution of these issues its highest priority. DOE is reanalyzing affected tanks to better understand possible chemical reactions affecting tank contents, potential accident initiators and consequences, and the probability of occurrence. In addition, this reanalysis is resulting in the development of scientifically sound and technologically feasible approaches to making the tank contents safe and reducing the risk to acceptable standards.

While DOE continues the development and initiation of an orderly process to address the ferrocyanide and hydrogen issues, it is working to identify, evaluate, and prioritize safety issues at all of the sites. DOE will then develop and implement plans for both short-term mitigation and long-term remediation of safety issues to ensure that the HLW is maintained in a safe condition until it can be treated for ultimate storage and/or disposal.

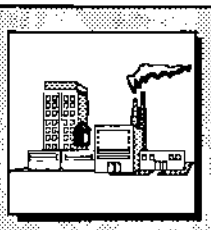
To ensure that all HLW tank operations are conducted in a safe manner in the future, DOE is initiating a comprehensive effort to review and upgrade all safety procedures,

documentation, criteria, and operating procedures. Review and upgrade of safety documentation will focus on the Safety Analysis Reports (SARs), which are the documents forming the basis for establishing the "safety envelope" that nuclear facilities must operate within. Many of the existing SARs were written under earlier standards and criteria and have not kept pace with evolving standards and criteria based on the additional knowledge that has been gained in the commercial nuclear safety area. Safety documentation will be systematically reviewed and upgraded to ensure that it meets current DOE Orders and guidelines and encompasses activities to be conducted for resolving safety issues and operating the HLW tanks.

Tank operations will be reviewed and upgraded to ensure that they are in compliance with the limiting conditions and operating procedures required by the SARs. This process will identify shortcomings in tank safety conditions that must be addressed or will confirm that the tank operations meet all applicable safety standards and are bounded by the safety envelope.

EM has created the HLW Tank Task Force to assist line management in expediting the evaluation and resolution of safety issues and the review and upgrading of safety and operational programs for HLW tanks. EM has also established the Tanks Advisory Panel, a group of senior advisors from academia, industry, and the national laboratories, to guide Task Force activities and advise DOE management on technical and programmatic issues. HLW tank safety activities are being conducted in close coordination with the numerous internal and external organizations that have oversight responsibilities of EM. They include the Office of Environment, Safety, and Health; the Office of Nuclear Safety; the Advisory Committee on Nuclear Facility Safety; the Defense Nuclear Facilities Safety Board; and the National Academy of Sciences Board of Radioactive Waste Management. Members of the oversight groups are invited to participate in technical workshops, briefings, and site visits to expedite communication and resolve concerns before they become issues. In addition, EM, supported by the Task Force, responds to recommendations received from oversight organizations, provides or arranges briefings, and facilitates the independent review activity.

2.2.3.1.2 VITRIFICATION



Vitrification using borosilicate glass provides for safely immobilizing high-level waste (HLW) for ultimate disposal.

The vitrification process selected for the three DOE HLW treatment facilities [the Defense Waste Processing Facility (DWPF) at Savannah River, South Carolina; the West Valley Demonstration Project (WVDP) at West Valley, New York; and the Hanford Waste Vitrification Plant (HWVP) at Richland, Washington] will incorporate HLW into a borosilicate glass matrix and reduce the mobility of radioactive and other hazardous constituents. In the selected vitrification process, waste and borosilicate glass-forming materials will be fed continuously as a slurry into a glass melter and heated to temperatures above 1,000°C. After becoming molten, the slurry will be poured into stainless steel canisters where it will cool and harden to form borosilicate glass (Figure 2.2.3.1.2). The sealed canisters will then be transferred to interim storage facilities at the sites and await transfer to a Federal repository.

The borosilicate glass form was selected as the end product at the three facilities because of its ability to accommodate variations in waste composition while maintaining acceptable processability. Borosilicate glass was one of many candidate waste forms considered by DOE for immobilizing radioactive constituents in HLW. The waste form ranked highest in several studies when collectively considering parameters such as its ability to handle fluctuations in waste composition, leach resistance, waste loading, mechanical strength, radiation stability, thermal stability, and overall processability. Remote operation of process equipment to produce borosilicate glass is a well developed technology.

The treatment schemes at these HLW treatment facilities vary somewhat because of the difference in waste composition and the quantities of HLW to be treated. At all three facilities, HLW will be pretreated and partitioned into low- and high-level radioactive fractions to reduce the amount of waste requiring immobilization in glass. In the DWPF scheme, the current inventory of HLW, 34 million gallons of sludge and salt solution/cake, is pretreated by in-tank processing. The salt portion is decontaminated by precipitation and sorption for disposal as low-level waste (LLW). The sludge is washed with water/caustic to remove soluble nonradioactive components. The salt precipitates, sorption products, and washed sludge are then mixed with glass frit and other additives and subsequently delivered to the melter. Plans are to accumulate previtrified waste in 2500 m^3 batches, each of which is expected to supply DWPF for 2 to 3 years of operation.

Two types of HLW, approximately 660,000 gallons in total, were initially stored at WVDP. Supernatant from one of the waste types is presently being treated by ion exchange. The sludge, as in the DWPF scenario, will be washed to remove the

nonradioactive soluble components. Both the decontaminated supernatant and the sludge wash waters will subsequently be disposed of as LLW. The washed sludge, spent ion exchange media, and other waste type will be combined into one batch, mixed with glass-forming chemicals, and subsequently fed to the melter.

Four types of HLW stored in the double-shell tanks at Hanford, approximately 6.7 million gallons in total, will be treated at HWVP. Some or all of the waste in the single-shell tanks may also be treated at HWVP. Depending on their characteristics, these wastes will undergo pretreatment by sludge washing, cesium separation, solids dissolution, transuranic separation, and/or organic destruction. Once pretreated, these wastes will be blended with frit and additives and subsequently transferred to the melter. The number and volumes of batches to be processed at HWVP are as yet undetermined.

The vitrification facilities are at various stages of completion. Hot operations at DWPF, WVDP, and HWVP are currently scheduled for 1993, 1996, and 1999, respectively. Groundbreaking at DWPF was initiated in 1983, and construction was completed in 1990. Cold chemical runs are to take place beginning in fall 1991. At WVDP, cold testing of the melter was initiated in 1984 and completed in 1989. Construction of the hot cell walls and process building to house the melter was initiated in 1990; this construction is currently 40 percent complete. Supernatant treatment and sludge washing at WVDP are scheduled for completion in 1993. Facility design of HWVP was initiated in 1990. Pretreatment options for HLW at Richland are being studied. HWVP site preparation is currently scheduled to start in April 1992. A preliminary systems engineering risk assessment has identified potentially significant problems with the use of existing facilities for processing feed for HWVP. In particular, B-Plant, which was built in the mid-1940s, may not meet today's RCRA requirements. Also, a thorough understanding of waste chemistry is necessary to safely retrieve waste from the tanks and pretreat it in B-Plant. Recent safety concerns with some of the Hanford tanks have highlighted the lack of detailed knowledge of tank constituents. The results of assessments, studies, and analyses in progress will not be available until 1992. They could have a significant impact on HWVP plans and schedule.

Vitrification operations at WVDP are projected to last 30 months and produce approximately 300 canisters of vitrified HLW. HWVP will operate for about 10 years and produce an estimated 1,780 canisters. If single-shell tank waste is treated, it will operate longer. These facilities will be subsequently decontaminated and decommissioned. The current inventory of HLW at DWPF will produce about 5,600 canisters in operations lasting 17 years. DWPF will remain on-line to treat any newly generated HLW.

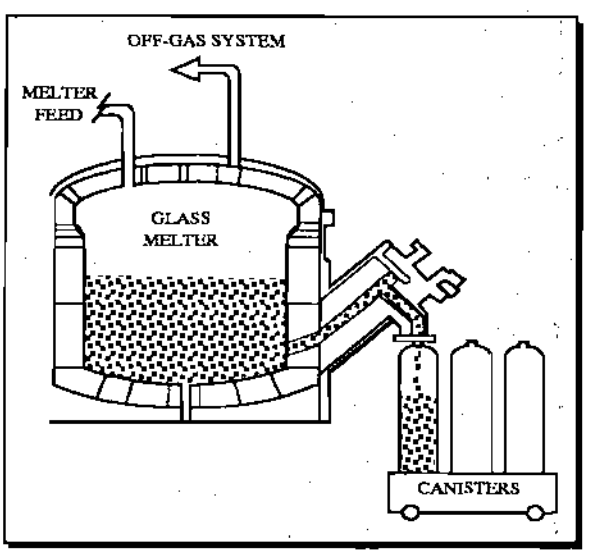
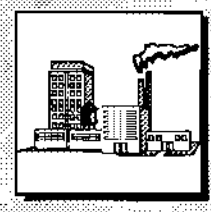


Figure 2.2.3.1.2. HLW is dissolved in molten borosilicate glass and poured into stainless steel canisters. The canisters will be sealed, stored onsite, and subsequently transported to a Federal repository for ultimate disposal.

2.2.3.2 TRANSURANIC WASTE PROGRAM



Sites are planning for the retrieval, characterization, and treatment of stored and newly generated transuranic (TRU) wastes.

TRU waste contains more than 100 nanocuries per gram of alpha-emitting transuranium radionuclides (e.g., plutonium) with half-lives greater than 20 years. Presently, DOE has about 61,600 m^3 of TRU waste in storage and is adding about 2,000 m^3 each year.

With more than 37,000 m^3 of TRU waste in storage, the Idaho National Engineering Laboratory (INEL) operates DOE's largest TRU storage program, as depicted in Figure 2.2.3.2. Rocky Flats (RF) is DOE's largest TRU waste generator.

DOE's principal strategy for managing TRU waste is based on the development of a geologic repository. For more than 10 years, the focus of this effort has been the Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico. The Draft Decision Plan (Section 2.2.3.2.1), which identifies the prerequisites for initiating the WIPP Test Phase, is being implemented successfully.

A number of major accomplishments have been produced by the WIPP program. These include issuance of the Supplemental Environmental Impact Statement (SEIS) (January 1990), SEIS Record of Decision (June 1990), WIPP Test Phase Plan (April 1990), Waste Retrieval Plan (May 1990), Final Safety Analysis Report (June 1990), the purchase of potash leases (June 1990), EPAs issuance of no-migration determination (November 1990), and completion of base facility (March 1991).

Since some TRU wastes at DOE sites have been stored longer than 20 years, plans are being developed to retrieve and repackage these wastes as necessary in order to ensure their safe storage and prepare them for shipment to WIPP.

All DOE TRU waste storage site facilities were designed for long-term storage, but most were developed before RCRA was enacted. While these facilities meet the intent of the RCRA regulations for controlled storage, many do not provide the aisle-spacing requirements for the passage of equipment and inspections. While not all of DOE TRU wastes are mixed, DOE's cost for retrieving, analyzing, and segregating the wastes and for constructing new storage facilities will likely exceed $200 million.

Another requirement of the TRU waste management system is finding an appropriate disposal method for the small volume of classified wastes (less than 1 percent of the total). While classified information is controlled on a "need to know" basis, DOE also recognizes that it must provide assurances that classified waste management operations are being conducted in accordance with applicable Federal and State environmental laws and regulations. To address this issue, DOE has requested that several States obtain security clearances for some of their regulatory personnel, thereby ensuring compliance with both environmental regulations and national security requirements.

Originally WIPP was to have opened in October 1988, and 125,000 drums of contact-handled TRU waste were to have been emplaced retrievably for a 5-year test period. The physical construction of WIPP was completed in 1989, and a multiyear Test Phase is now expected to begin during 1991. The delay reflects the cumulative impact of legal, technical, environmental, and logistical requirements placed on WIPP which must be satisfied prior to beginning the Test Phase. Moreover, until scientific uncertainties are resolved and compliance with applicable regulations can be determined, only a limited amount of waste—up to 4,500 drums—will be emplaced in WIPP for tests.

TRU waste operations at all sites have been impacted by the delay in the opening of WIPP and the need to develop an equitable storage solution. A DOE task force is focusing on finding alternative interim storage locations for RF TRU wastes, pending their ultimate disposal.

Sites are also reexamining their plans for waste characterization and treatment due to the WIPP Test Phase requirements and promulgation of the RCRA Land Disposal Restrictions (LDRs) and the dual regulatory requirements. DOE's TRU waste management system has been significantly affected by the dual regulatory requirements that are applicable to mixed TRU wastes, which contain hazardous waste constituents as defined by the RCRA regulations and radioactive components regulated under the Atomic Energy Act. LDRs, a key element of the RCRA regulations, prohibit the disposal of certain untreated hazardous materials either in or on the land unless it can be demonstrated that there will be no migration of hazardous constituents (above health-based limits) for as long as the waste remains hazardous. DOE RCRA strategy for mixed TRU waste is to rely on the results of activities conducted during the Test Phase to support a conclusion by DOE that no migration of the LDR component will occur after WIPP disposal. EPA would then be requested to make a no-migration determination for the WIPP disposal phase. One of the purposes of the test activities is to determine what wastes might need additional treatment and what kind of treatment would result in an acceptable waste form for repository performance and for RCRA compliance.

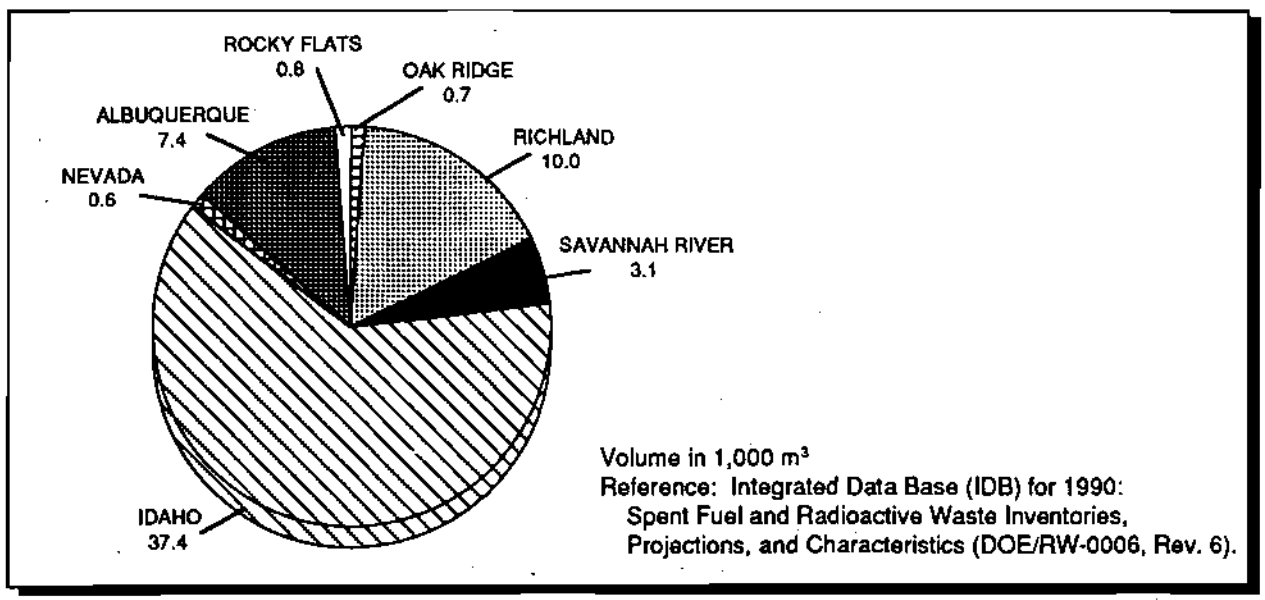


Figure 2.2.3.2. The majority of DOE's retrievably-located TRU wastes are located at INEL. Neither the Chicago Field Office nor the San Francisco Field Office currently has long-term storage capability.

2.2.3.2.1 WASTE ISOLATION PILOT PLANT

DOE is making progress in meeting requirements at the Waste Isolation Pilot Plant (WIPP) to safely begin to conduct the Test Phase to demonstrate compliance with environmental and disposal regulations.

The WIPP facility near Carlsbad, New Mexico, was constructed as a research and development (R&D) facility to demonstrate the safe disposal of defense program transuranic (TRU) waste in a geologic repository. DOE's strategy for managing defense TRU wastes has focused on the development of WIPP for safe disposal of over 6 million ft^3 of TRU wastes.

Prior to a decision on the suitability of the WIPP facility for disposal of TRU wastes, R&D activities of the Test Phase will be conducted in compliance with DOE Orders and other applicable environmental standards and State agreements to determine if WIPP can comply with long-term disposal standards in 40 CFR 191, Subpart B, and 40 CFR 268.

The start of the Test Phase is linked to a decision by the Secretary of Energy that the facility is safe to operate. Since October 1989, numerous prerequisite activities have been identified and managed by a Draft Decision Plan issued by the Secretary. The Decision Plan identifies the relationship between various activities, indicates the status of prerequisites for waste receipt, and provides a best estimate of the schedule for completion. The Plan also identifies the critical path for both external and internal readiness of WIPP. The Draft Decision Plan is updated on a bimonthly basis and provided to interested groups for comment. Comments received from congressional committees, governors, other Federal agencies, interested groups, and individuals are reviewed and addressed in subsequent revisions. The most recent Draft Decision Plan (Revision 7) was approved by the Secretary on March 29, 1991, and is presented in Figure 2.2.3.2.1. The Plan identifies key WIPP readiness milestones, including the completion of the base facility in March 1991; and readiness to begin the Test Phase in July 1991, depending on the extent of external comments. The Plan, based on a detailed, resource-loaded schedule of activities, accounts for all prerequisites at the WIPP site and waste generator sites supporting readiness to begin the Test Phase.

Over the past year, much progress has been made toward the start of the Test Phase, including completion of the base facility and readiness of the transportation system, the issuance of a no-migration determination by EPA, approval of administrative land withdrawal by the Department of the Interior, resolution of potash mineral leases for the site, completion of the Final Safety Analysis Report (FSAR), completion of a Supplemental Environmental Impact Statement (SEIS), issuance of a Record of Decision on the SEIS, completion of a waste retrieval plan and waste characterization

plan, and submittal of RCRA Parts A and B Permit Applications to the State of New Mexico. In response to a Resolution passed by the House Committee on Interior and Insular Affairs on March 6, 1991, the Department of the Interior has proposed to modify the administrative land withdrawal to prohibit the emplacement of Test Wastes within WIPP until June 30, 1991. DOE and the State of New Mexico prefer permanent legislative land withdrawal for the WIPP site. DOE is working with Congress to achieve this objective.

Several prerequisites outside DOE control have the potential to delay the start of the Test Phase at WIPP. These items continue to receive close management attention. Examples of this include final transportation route designation by New Mexico, resolution of New Mexico RCRA issues, and resolution of independent external review comments. Other prerequisites within DOE control include preparation of Quality Assurance Plans, completion of an FSAR Addendum for the dry bin tests, completion of the integrated systems checkout, and bin preparation activities.

DOE will conduct Test Phase experiments in accordance with the WIPP Test Plan and complete the required performance assessment. Plans call for the following two programs utilizing TRU wastes: the Bin-Scale Test Program and the Alcove Scale Test Program. The Bin-Scale Test Program will utilize test wastes in carbon steel bins to measure gas production rates and radiological source term data under controlled conditions. The data obtained will be a function of items such as waste type, atmospheric condition, brine quantity, waste interactions with salt, container metals, and backfill and gas getter materials. Tests and resulting performance assessment activities are planned for 5 to 6 years consistent with the Test Phase Strategy for WIPP.

The Alcove Scale Test Program will obtain data on the large-scale production, depletion, and composition of gases resulting from the in situ degradation of TRU wastes. These room-scale tests will validate the results of laboratory and bin-scale tests within the WIPP facility. These test activities will be conducted on a schedule to support a decision on the permanent disposal of wastes at WIPP in late 1997.

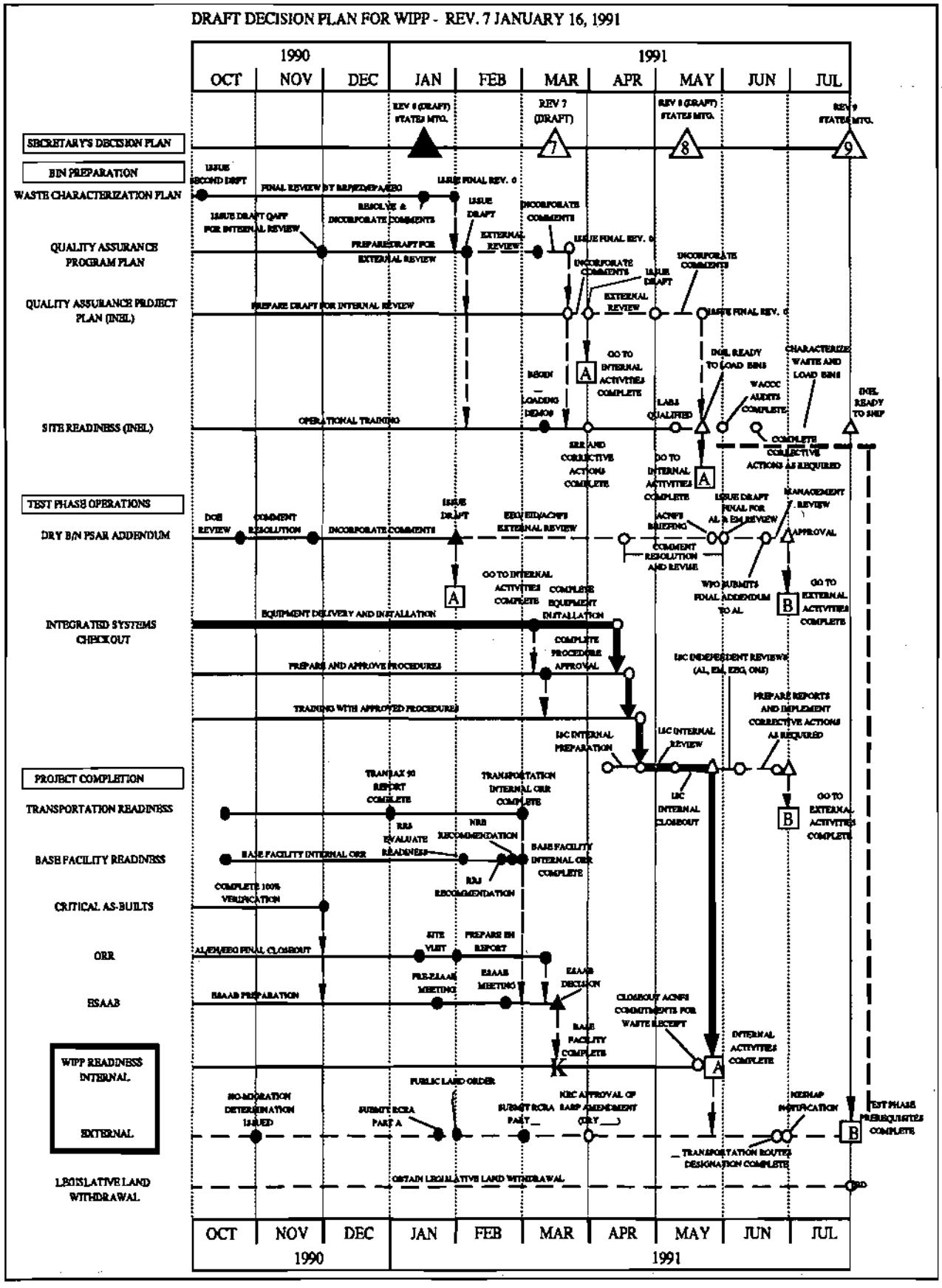


Figure 2.2.3.2.1. DOE is making steady progress in meeting requirements to safely begin the Test Phase at WIPP.

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2.2.3.2.2 TRANSURANIC WASTE STORAGE

DOE is expanding and improving its storage facilities for transuranic (TRU) waste as a result of delays in the availability of the Waste Isolation Pilot Plant (WIPP) for permanent waste disposal and to meet RCRA requirements.

DOE stores TRU waste at many locations within the DOE waste management complex. Storage of newly generated waste will continue for at least 5 or 6 years pending the completion of the Test Phase and a decision on the suitability of WIPP for permanent disposal.

TRU waste is stored in two types of storage facilities: (1) facilities designed for long-term storage of TRU waste prior to the availability of permanent disposal and (2) interim storage facilities designed for temporary storage until shipment can be made to a long-term storage or permanent disposal facility.

DOE currently has about 62,000 m^3 of TRU waste in long-term storage facilities at seven DOE sites. Six of these sites—Hanford, Los Alamos National Laboratory, Idaho National Engineering Laboratory (INEL), Savannah River Site, Oak Ridge National Laboratory, and Nevada Test Site—provide long-term storage for about 99 percent of the total. Virtually all of the remaining TRU waste—about 800 m^3—is in interim storage at Rocky Flats (RF). Very small amounts of TRU waste are also in interim storage at Argonne National Laboratory-East, the Mound Plant, Sandia National Laboratories-Albuquerque, and the Lawrence Livermore National Laboratory. Waste from these latter sites is moved as necessary to one or more of the sites providing long-term waste storage.

DOE has been preparing for shipment of TRU waste to WIPP by planning facilities to process and store waste meeting the WIPP waste acceptance criteria and transportation requirements. Examples of these facilities are the Waste Receiving and Processing Plant at Hanford, the Idaho Characterization and Storage Facility, and the Idaho Waste Processing Facility.

TRU waste in interim storage at Rocky Flats represents a special situation. Until recently, INEL served as the long-term storage location for waste from RF, for many years DOE's largest TRU waste generator. In 1989, further plutonium processing at RF was halted for a variety of health, safety, and environmental concerns. Then in early 1990, the Governor of Idaho announced that he would not allow receipt of TRU wastes from other DOE sites for storage at INEL. Except for RF, other generators which had relied on INEL for long-term storage were able to shift their waste to alternate sites.

A DOE task force is evaluating alternative temporary storage locations for RF TRU wastes pending their shipment to WIPP. Three options have been identified: (1) storing RF TRU waste at other DOE sites, (2) establishing a commercially owned and operated storage site, and (3) storing the waste at a Department of Defense (DOD)-controlled site. The first option has been the subject of continuing discussions with the

involved States several times in 1990 and 1991. The commercial storage option is being pursued as a procurement activity. A draft Statement of Work was published for review in April 1991. A joint DOE/DOD task force is screening potential sites for the third option. The necessary National Environmental Policy Act documentation and safety assessments for storing wastes at the various sites will be completed before any decisions are made on where to store the RF waste.

Better waste characterization, specifically more precise identification of the waste materials, is resulting in a better understanding of the DOE waste in storage. This analysis has reduced the amount of waste identified as TRU and correspondingly increased the amount classified as low-level waste (LLW).

Pending the availability of WIPP for disposal operations, the need for additional long-term storage capacity will be driven primarily by the volume of newly generated TRU waste in relation to existing capacity. The volume of newly generated waste will depend on a number of factors, including the need for plutonium processing to meet nuclear weapons requirements; plutonium recovery from weapons retirements; site cleanup and facility decontamination and decommissioning; and the success of waste minimization efforts and waste volume reduction activities. The uncertainty surrounding many of these factors makes it difficult to estimate future waste generation accurately.

The need for new storage capacity will also depend on the amount of existing capacity rendered inadequate by the need to meet new safety and environmental requirements. DOE recognizes the need to alter current TRU waste storage to comply with RCRA regulations, and yet must maintain a balance with the Atomic Energy Act regulations to keep radiation exposure "as low as reasonably achievable" (ALARA). RCRA characterization and requirements for frequent inspections, aisle space, and labeling represent ALARA concerns.

Finally, many existing DOE "interim status" storage facilities with RCRA Part A Permits face closure in November 1992 because RCRA regulations require that "interim status" facilities be replaced with Part B "RCRA permitted" facilities beyond that time. DOE is, therefore, planning new Part B permitted waste storage capacity for land disposal restricted mixed TRU waste generated after November 1992. Since these regulations also apply to waste removed from present storage locations, additional Part B storage capacity is also necessary for currently stored waste being retrieved, processed, certified, and restored pending the availability of WIPP for disposal as well as for waste in deteriorating packaging conditions that must be retrieved, repackaged, and also restored prior to disposal.

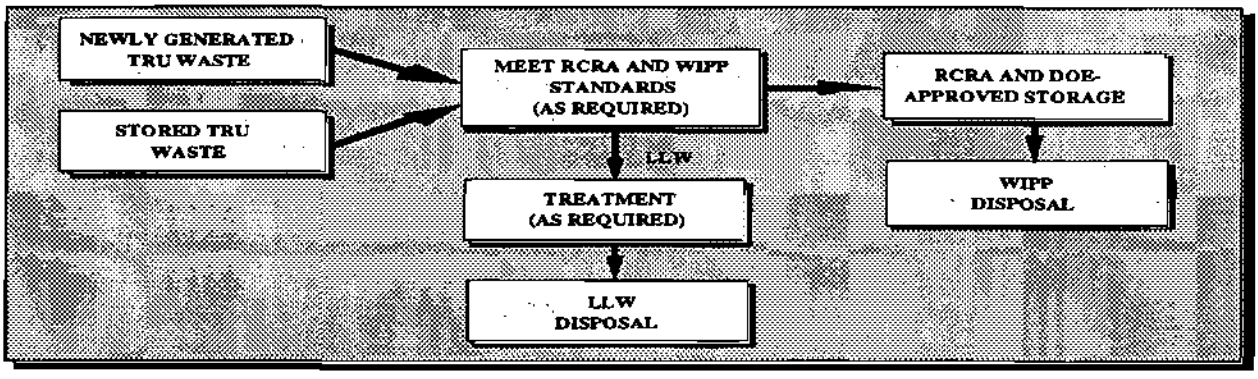


Figure 2.2.3.2.2. New TRU waste storage facilities will comply with both DOE and RCRA requirements.

2.2.3.3 TREATMENT OF MIXED TRANSURANIC AND LOW-LEVEL WASTE

Treatment technologies and facilities will be needed for mixed low-level waste (LLW) and may be needed for mixed transuranic (TRU) waste prior to disposal.

Mixed wastes are radioactive wastes which are also contaminated with hazardous wastes regulated under RCRA and administered by EPA. A large fraction of DOE's TRU and LLW generated each year is "mixed" waste. Estimates based on process knowledge also suggest that a similar condition holds for the TRU waste in long-term storage and the LLW in near-surface disposal facilities.

Some RCRA hazardous wastes are subject to land disposal restrictions (LDRs) (i.e., they cannot be land-disposed unless EPA-prescribed treatment standards are met or EPA grants a variance permitting disposal). At present, LDRs apply to solvents, dioxins, and "California list" wastes. Due to a nationwide lack of treatment capacity, EPA delayed application of LDR regulations to other radioactive mixed wastes until May 1992. After May 1992, the so-called National Capacity Variance for these wastes will end. Except for an extension of up to 2 years, which can be granted by EPA for third/third wastes on a case-by-case basis, from that point on all mixed TRU or mixed LLW newly generated or removed from present storage locations will be subject to the LDR requirements. Mixed LDR waste stored prior to the LDR effective date and left "undisturbed" is exempted from the requirements.

Rather than commit at this time to treatment prior to disposal, the DOE strategy for mixed TRU waste is to evaluate whether in the Waste Isolation Pilot Plant (WIPP) facility there will be no migration of the hazardous constituents for as long as the waste remains hazardous. Under current regulations, a "No Migration Variance" can be granted by EPA, which would allow DOE to dispose of mixed TRU waste containing LDR constituents in WIPP without prior treatment. DOE is relying mainly on the results of activities conducted during the Test Phase to support a variance for WIPP for the disposal phase. EPA has granted a conditional no-migration determination for the Test Phase.

Nevertheless, there is no guarantee that the results of the Test Phase will be adequate to support a no-migration variance by EPA or, even if the variance is granted, that there will not be other conditions added by EPA which may make prior treatment a more practical alternative. Because of this uncertainty, DOE is actively examining the treatment option for mixed TRU wastes.

In contrast to mixed TRU waste, there is no question that newly generated mixed LLW will be subject to LDR treatment requirements. DOE is already operating and will continue to operate facilities which provide for treatment of certain mixed LLW streams. These include dilute effluent treatment plants, the Grout Treatment Facility for solidifying low-level tank wastes at Hanford, and incinerators at the Los Alamos

National Laboratory, the Oak Ridge Reservation, and the Idaho National Engineering Laboratory.

DOE is also evaluating future capabilities needed for treating mixed LLW or potentially needed for treating mixed TRU waste. To fully meet treatment needs, technologies must be developed for some waste streams and, in some cases, the capacity of proven technologies will have to be increased. Facilities which will add to the current treatment capabilities, such as the Consolidated Incinerator Facility at the Savannah River Site, are currently in design/construction.

Plant design concept studies to evaluate the mission and processing scope of future mixed waste treatment facilities will be prepared. Cost-benefit studies will be conducted to assess the options of onsite vs offsite treatment. It may be more cost-effective, for example, to establish thermal treatment facilities at only a few sites rather than at the many sites where waste is generated. These concept studies, cost/benefit analyses, and the outcome of the Programmatic Environmental Impact Statement will assist in determining the location and design of future treatment facilities.

As part of this overall effort, planning is under way for a demonstration treatment facility for mixed LLW. Process and treatment technologies will be evaluated and justified with respect to regulatory and waste management requirements. Planning for potential application to mixed TRU waste will be coordinated with the WIPP Test Phase. The Test Phase will provide the primary guidance for the level of waste treatment and the categories of mixed TRU waste needing treatment. DOE is identifying existing and projected mixed LLW streams in the complex and defining the technical, operational, and regulatory requirements for proceeding with a treatment technology demonstration.

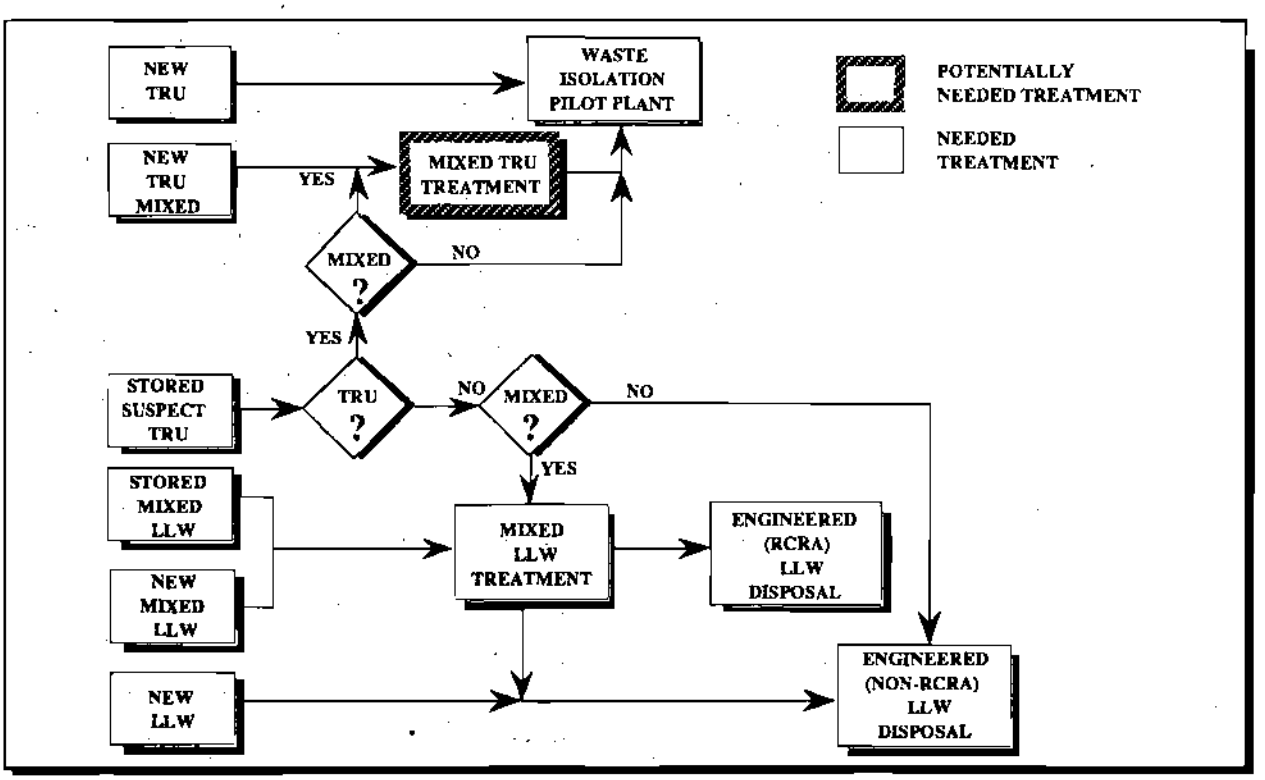
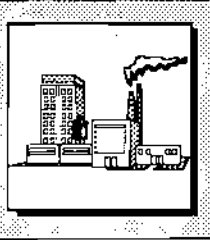


Figure 2.2.3.3. Treatment of the RCRA-regulated component in mixed waste may be required to render the waste acceptable for disposal.

2.2.3.4 LOW-LEVEL WASTE PROGRAM OVERVIEW



Low-level waste (LLW) management activities are focused to remedy shortfalls in the areas of characterization, treatment, storage, and disposal, resulting in less waste to dispose of and less impact on the environment.

DOE is preparing an Environmental Restoration and Waste Management Configuration Study and a Programmatic Environmental Impact Statement to identify and evaluate management options for radioactive and mixed wastes. These studies will help DOE determine the best way to manage these types of waste and the best locations for the management activities to be performed. While these studies are being conducted, DOE is continuing to add to its waste characterization capabilities, storage capacity, treatment systems, and disposal technologies for LLW, including mixed LLW.

Improved characterization of LLW is being developed to help distinguish the mixed waste portion so that only radioactive wastes are designated for disposal in facilities intended for radioactive waste disposal and mixed wastes are disposed of in facilities permitted for that type of waste. DOE is also improving its characterization of wastes to eliminate waste streams from the LLW and mixed waste categories and to implement effective volume reduction and waste minimization programs. Waste segregation programs are one way of eliminating wastes from the LLW or mixed LLW streams. Improvements in characterization are also under way so that the correct treatment method for the waste is developed and utilized.

Improved treatment methods will serve many purposes. Treatment technologies will be applied to meet current and proposed treatment standards. The Waste Experimental Reduction Facility at the Idaho National Engineering Laboratory and the Toxic Substances Control Act Incinerator at the Oak Ridge K-25 Site will serve this function. These incinerators and one planned for the Savannah River Site will also provide for volume reduction of waste. Treatment technologies will provide waste forms that are stable and have low potential for creating an adverse environmental impact. The Saltstone Facility at the Savannah River Site and the Grout Treatment Facility at Richland will solidify liquid LLW and mixed LLW streams into stable waste forms for disposal.

LLW and mixed LLW are stored at many locations within the DOE waste management complex. Storage is an interim measure for waste management pending availability of proper treatment and/or disposal facilities. Many sites are storing radioactive waste while completing actions to meet waste acceptance criteria established by DOE Orders and the disposal sites. Mixed LLW is being stored for the same reason and also due to a lack of compliant treatment and disposal facilities. DOE storage facilities are being upgraded, and new facilities are being added to provide RCRA-compliant storage. As proper treatment and disposal technologies and facilities become available, waste will be removed from storage, and DOE will advance toward its goal of

disposing of all waste in an environmentally sound manner.

Improvements are also being made in the disposal of LLW and mixed LLW generated by DOE facilities. New disposal capability is being made available for radioactive mixed waste using the double-lined trench design required by RCRA. In addition, to improve shallow trench land burial, disposal of LLW will be accomplished utilizing other advanced technologies. A new disposal facility opening at the Savannah River Site will utilize the belowground vault concept for disposal of LLW. A planned facility at the Oak Ridge Reservation will use a tumulus design for disposal of some of the LLW generated there.

DOE is also assisting in several ways in advancing and improving the treatment, storage, and disposal of commercial LLW. The DOE National Low-Level Waste Program is assisting States and Compacts in developing a national system for management of commercially generated LLW to meet requirements stated in the Low-Level Radioactive Waste Policy Act of 1980 and the Low-Level Radioactive Waste Policy Amendments Act of 1985. DOE is also implementing a three-part strategy for management of commercial Greater-Than-Class-C wastes as directed by the 1985 Act. Section 2.2.3.4.2 details the DOE National Low-Level Waste Program and the Greater-Than-Class-C strategy.

With these improvements in waste characterization, treatment, storage, and disposal and with volume reduction and effective waste minimization programs, DOE will produce less LLW in need of disposal and will continue to reduce the environmental impacts of LLW management activities.

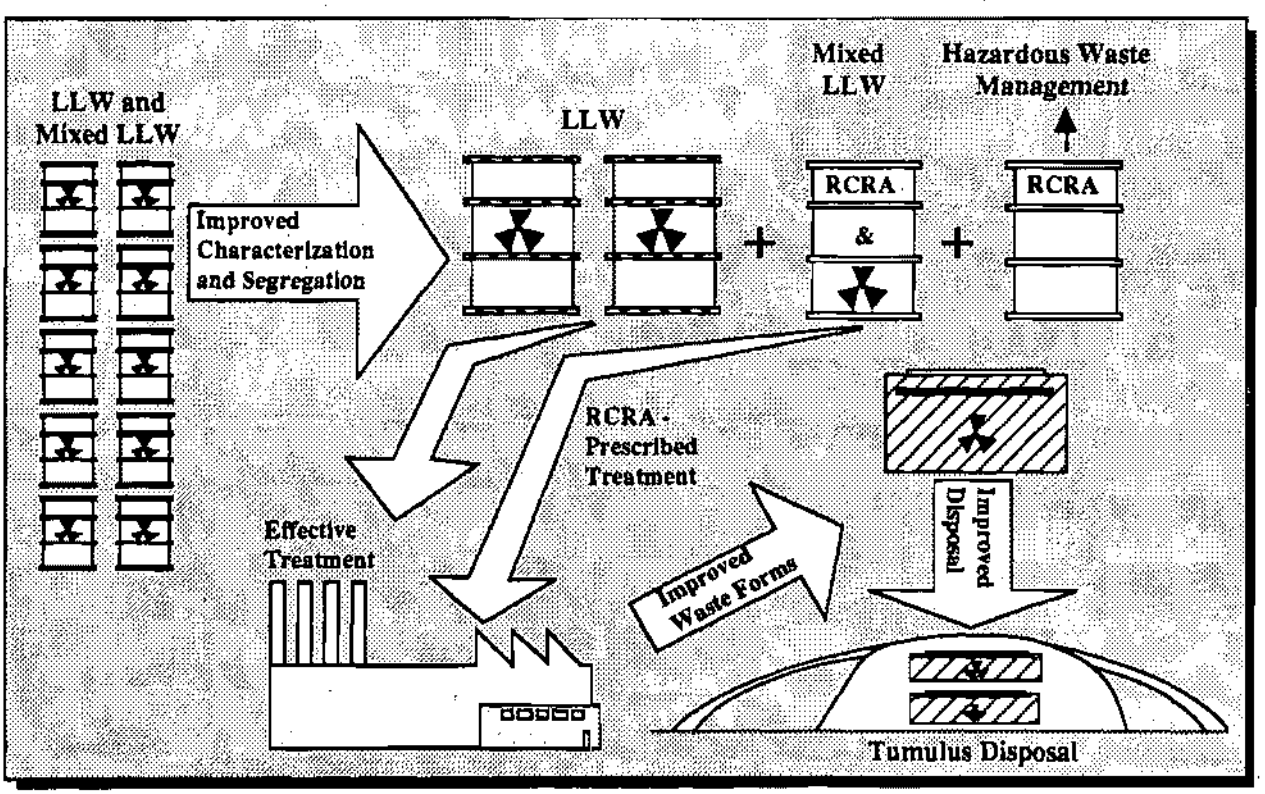


Figure 2.2.3.4. Improved LLW Characterization, Treatment, and Disposal Technologies and an effort to use storage only as a temporary measure will result in less environmentally harmful waste requiring disposal.

2.2.3.4.1 LOW-LEVEL WASTE DISPOSAL AVAILABILITY

Lack of State and public acceptance of waste treatment and disposal technologies threatens DOE's ability to safely dispose of low-level waste (LLW) and mixed LLW.

Host State governments and State residents are increasingly objecting to the import of out-of-state LLW into their States for treatment, storage, or disposal. There is a similar concern about transuranic waste storage addressed in Section 2.2.3.2.2. To transport waste to the location most appropriate for its treatment or disposal, DOE must understand and resolve State and public objections.

There are six DOE sites which have operating or planned disposal facilities for LLW (see locations on Figure 2.2.3.4.1). These six sites represent the disposal capacity within the Department for an estimated 68,000 m^3/year of LLW. Only one facility is currently authorized to receive mixed LLW. However, this capability will be expanding at other sites. Moreover, an unknown volume of waste will be generated from DOE environmental restoration activities.

Facilities necessary for treatment of mixed LLW are only currently available at a few of the DOE sites. DOE is aware that some portion of the waste from each of the sites will require treatment. This necessitates the construction and operation of the treatment facilities at each site or the transportation of waste to a selected number of sites.

Through the preparation of a Programmatic Environmental Impact Statement (PEIS), DOE will be evaluating the environmental impacts of various alternatives for the treatment and disposal of LLW, including the mixed portion. In the interim, DOE will continue to use exisiting facilities for disposal of LLW from all DOE sites.

DOE will continue to inform the public of waste management alternatives being considered and will solicit comment on waste management proposals. Scoping meetings and public comment on the PEIS are opportunities for the public and the States to provide input on waste management alternatives. Other activities involving the public and States, such as newsletters, public reports, outreach programs, site tours, and public meetings, will continue to be conducted at all of the sites.

DOE is discussing with the States on a national and regional level methods by which we can ensure LLW is safely managed.

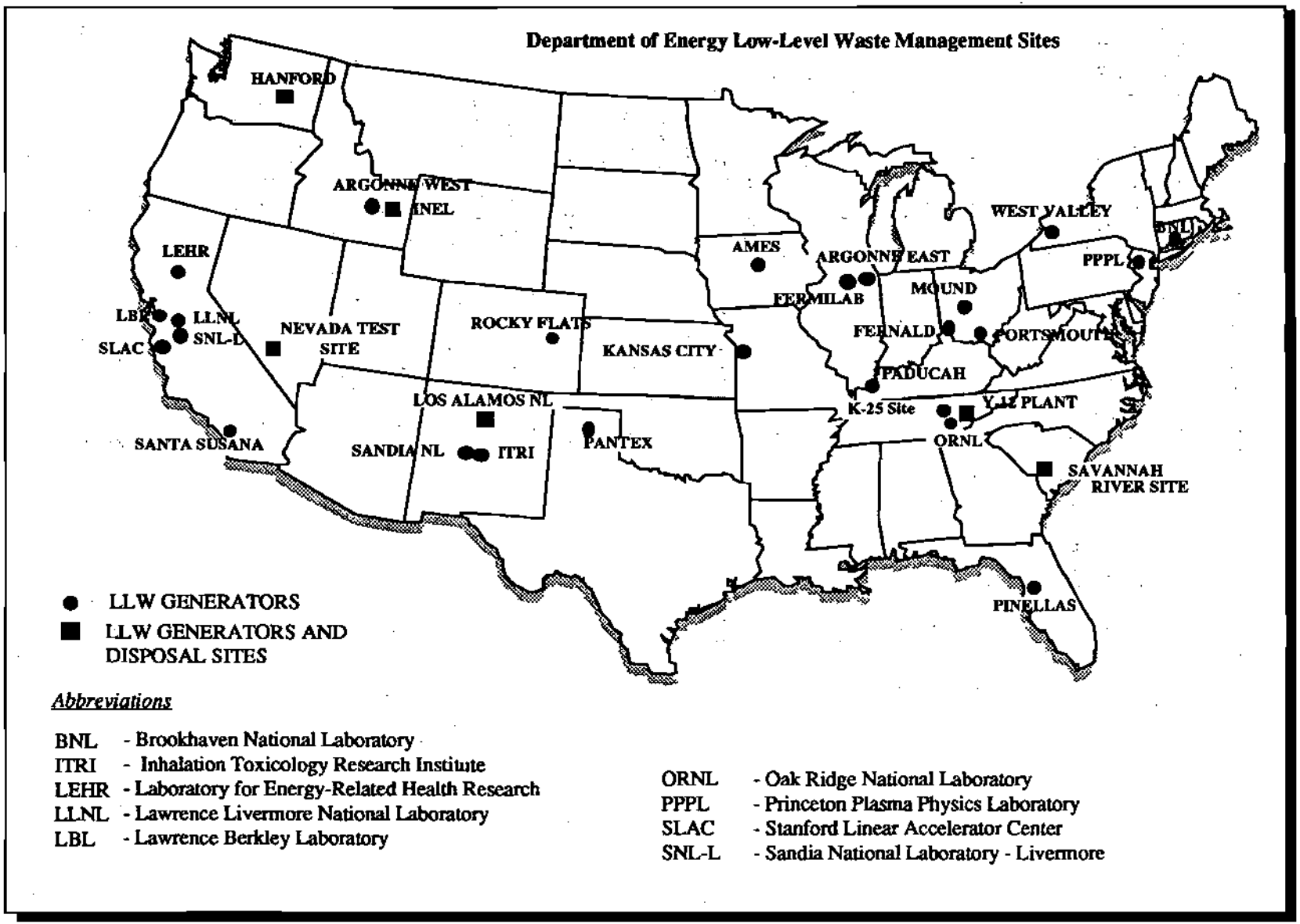
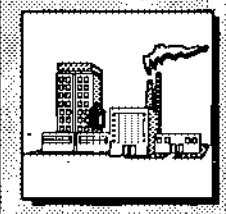


Figure 2.2.3.4.1. Disposal of DOE waste requires the transport of waste from at least 20 nondisposal sites to 1 of the 6 DOE disposal facilities.

2.2.3.4.2 THE NATIONAL LOW-LEVEL WASTE PROGRAM/COMMERCIALLY GENERATED GREATER-THAN-CLASS C LOW-LEVEL WASTE



While Public Law 96-573 of 1980 requires States to dispose of all low-level waste (LLW) generated within their borders, Public Law 99-240 (the Low-Level Radioactive Waste Policy Amendments Act of 1985) requires the Federal government (DOE) to provide technical and other assistance to States in their efforts to meet responsibility under the law and for the Federal government to dispose of Greater-Than-Class C (GTCC) LLW.

In 1959, the States' responsibilities for licensing and regulating LLW began with an amendment to the Atomic Energy Act of 1954. In 1980, the States' responsibilities for the disposal of all LLW generated within their borders by Nuclear Regulatory Commission (NRC) and Agreement State licenses were specifically outlined in Public Law 91-573, the Low-Level Radioactive Waste Policy of 1980. In 1983, NRC developed LLW disposal guidelines through Regulation 10, CFR, Part 61, categorizing LLW into Classes A, B, and C based on concentration of radionuclides. LLW exceeding the limits for Class C is identified as GTCC and is generally unacceptable for near-surface disposal.

In 1985, Public Law 99-240, or the LLW Policy Amendments Act, further clarified the States' responsibilities for the disposal of LLW, encouraged the formation of regional Compacts, and established milestones with incentives and penalties regarding the timely development of disposal facilities. This Act required DOE to provide technical and financial assistance to the States and Compacts for the disposal of LLW.

DOE has developed a program to meet its technical and financial assistance responsibilities to States and Compacts, including meeting specific technical coordination needs, producing modules that address technical issues in a comprehensive manner, maintaining program liaisons among the key program organizational components, and providing direct technical support to States or Compacts regarding their individual needs. DOE administers the surcharge escrow account from which States, Compacts, or LLW generators may receive surcharge rebates if they successfully meet the guidelines established in the Act. In 1990, DOE developed draft regulations to establish a clear procedure for returning rebates to the appropriate entity. The annual reports prepared by DOE include the Surcharge Rebate Expenditure Report, the State-by-State Assessment Report (Figure 2.2.3.4.2a), the Unusual Volume Report, and the Annual Report to Congress. DOE maintains an extensive data base of information on LLW, including volume, radioactivity, State of origin, and disposal site. In 1990, system assessments by its users resulted in the implementation of new activities that will change some components and delete others to make the system more cost-effective and efficient.

In response to the legislative requirement for DOE to dispose of GTCC radioactive waste, DOE has developed a three-phase strategy (Figure 2.2.3.4.2b) to provide for safe and effective management of commercially generated GTCC waste. The first phase of the strategy is to provide for interim storage of limited amounts of GTCC waste that pose a

potential threat to public health or safety. A typical example of this is a sealed source no longer in use. In 1990, existing DOE facilities were reviewed to determine interim storage capability. In 1991, environmental documentation will be prepared concerning the finalization of the selection of a specific DOE facility for interim storage.

The second phase of the strategy provides for a centralized, dedicated storage facility for all commercial GTCC wastes until an NRC-licensed disposal facility becomes available. During this phase, DOE will consider privatization options and the use of commercial storage locations and will analyze requirements for packaging, transportation, fee specifications, and treatment.

The third phase provides for the disposal of GTCC waste, either storage in conjunction with a high-level waste repository or a separate GTCC disposal facility. During 1991, an analysis of volumes and characteristics will occur, although final disposal of GTCC waste is not expected for many years.

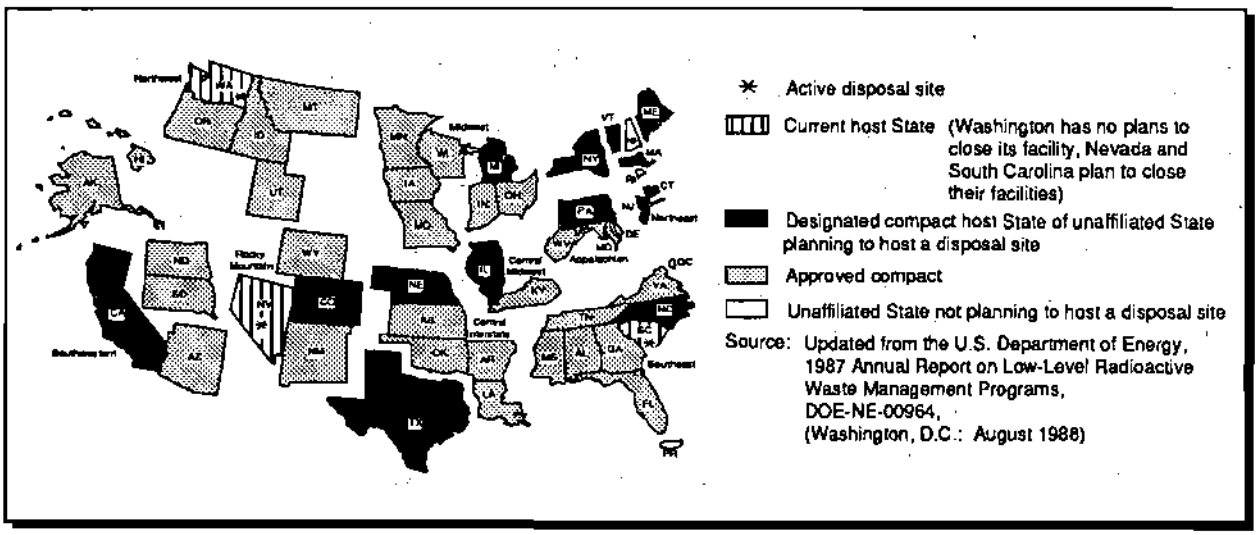


Figure 2.2.3.4.2a. Current Configuration of States and Compacts

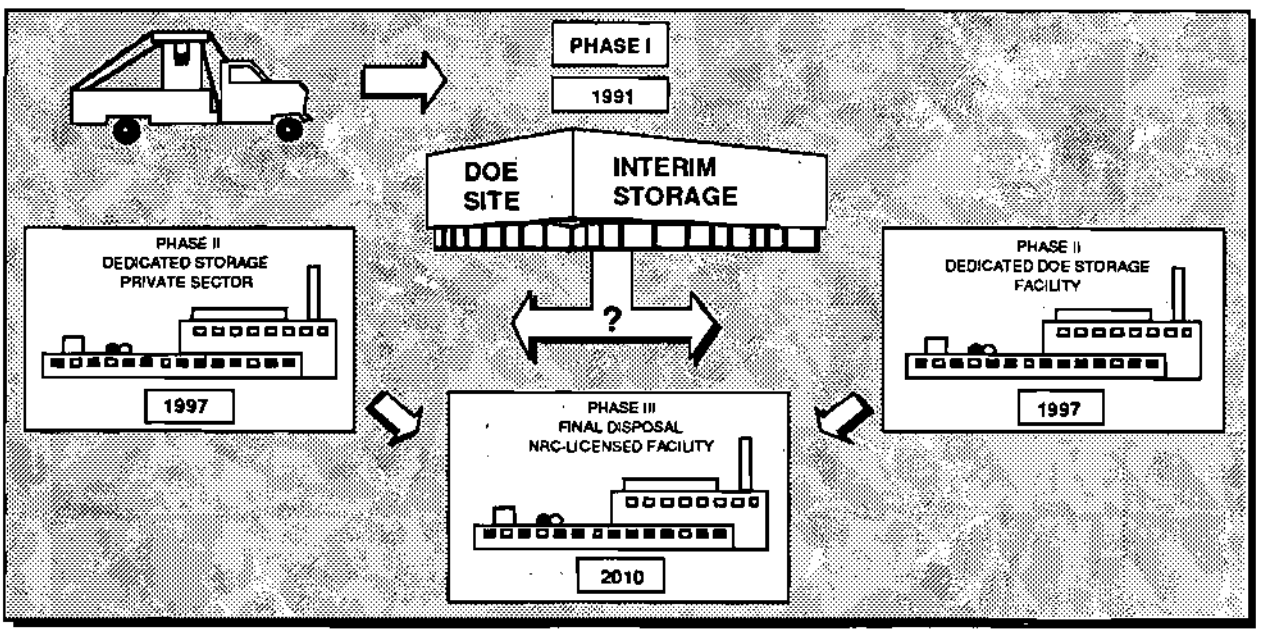


Figure 2.2.3.4.2b. DOE strategy for commercial GTCC wastes is based on a three-phase approach.

2.2.3.5 OVERVIEW OF HAZARDOUS WASTE PROGRAM ACTIVITIES

DOE Hazardous Waste program activities will result in minimization, regulatory compliance, and treatment, storage, and disposal (TSD) of hazardous waste. DOE is using both its own and offsite commercial facilities to comply with regulations.

Hazardous waste management addresses materials identified as hazardous or requiring regulatory control as stipulated by RCRA, the Toxic Substances Control Act, and the Clean Water Act. For example, materials such as trichloromethane, polychlorinated biphenyls (PCBs), mercury, and cadmium are classified as hazardous waste. The Land Disposal Restrictions (LDRs) regulation 40 CFR 268 under RCRA requires treatment of the hazardous constituents of wastes to specific concentration levels before disposal. These regulations are interpreted by the States or EPA regions and are applied to local DOE operations. As the regulations mature, the regulatory agencies steadily increase the number of waste types restricted from land disposal without proper treatment. Similarly, disposal facilities must meet increasingly stringent waste acceptance criteria. DOE's hazardous waste program is designed to comply with these regulatory requirements, reduce risk to human health and the environment, and minimize waste generation.

EM has a five-point strategy for handling and managing hazardous waste:

1. Avoid Hazardous Waste Generation. The best approach is to minimize and/or eliminate hazardous waste generation. EM programs currently in place minimize and eliminate the use of chlorinated solvents in their facilities (e.g., nonplutonium operations eliminating the use of carbon tetrachloride at Rocky Flats, recycling mercury waste at the Savannah River Site, and recycling antifreeze at Richland).

2. Treat Hazardous Waste. DOE's near-term objective is to treat hazardous waste as it is generated, thus avoiding additional storage capacity. Two examples of this are the hazardous and mixed waste incinerator at Oak Ridge and the planned incineration facility at Savannah River. Wet oxidation and other technologies are being investigated by the Office of Technology Development (OTD) for specific hazardous waste treatment.

3. Dispose of Hazardous Waste. DOE disposes of hazardous waste in permitted DOE facilities and commercial facilities after minimization and treatment. When DOE uses licensed commercial facilities for the disposal of its hazardous wastes, priority in selecting a vendor is given to recycling, then treatment, and finally, containment and storage.

4. Use Applicable Commercial Technology. DOE uses the best available technology for hazardous waste treatment, including commercial technology, and intends to upgrade as new methods are developed.

5. Control Liability. DOE may consider controlling liability by using RCRA-permitted DOE TSD facilities instead of commercial hazardous waste disposal sites.

Figure 2.2.3.5 illustrates this five-point strategy. As treatment and minimization efforts increase, the volume of waste disposal should steadily diminish. Storage, however, will peak and then steadily diminish as advanced programs for minimization and treatment are put into effect. Figure 2.2.3.5 is for illustration purposes only; actual timing will more than likely differ.

LDR regulation 40 CFR 268 under RCRA requires treatment of the hazardous constituents of wastes to specific concentration levels before disposal. Some progress has been made in developing and implementing methods to reduce or eliminate the hazardous components of the waste. For example, Lawrence Berkeley Laboratory installed an acid neutralization system for Building 70/70A. Los Alamos is designing a waste treatment facility to recycle lead and waste oil and neutralize plating waste.

In many cases, neither DOE nor industry can meet current and proposed LDR regulations. As a result, available storage will have to increase until technology demonstrates effective methods for reducing the toxicity of the hazardous waste to below established limits. However, LDR regulations prohibit the storage of banned waste, except to accumulate sufficient quantities to facilitate proper recovery, treatment, or disposal.

OTD is funding research for waste minimization and for associated waste treatment technologies to meet these challenges.

Last year, DOE made progress on a wide range of hazardous waste issues. Several sites currently report upgrades and new construction of hazardous storage facilities meeting RCRA requirements. Some of these accomplishments include:

- continued upgrading and removal of underground storage tanks (USTs) to meet the requirement of 40 CFR 280 [e.g., Argonne National Laboratory-East (ANL-E) plans to replace nine in-use USTs with new USTs, and eight in-use USTs will be upgraded to comply with UST regulations. Five in-use USTs will be removed and permanently closed] and
- continued removal of PCB-containing transformers (e.g., ANL-E has replaced all but 18 PCB-containing transformers, which will be removed this year, and Richland plans to replace 17 PCB-containing transformers this year).

DOE will continue to make progress on a wide range of hazardous waste issues. Several sites are planned for the upgrade or building of new TSD facilities. Some of the planned activities include:

- construction of hazardous waste treatment facilities (e.g., Idaho National Engineering Laboratory plans to build a treatment facility that will provide "cradle-to-grave" management of hazardous waste, and Nevada Test Site plans to construct a RCRA-compliant waste storage facility) and
- continuation of upgrading and removal of USTs to comply with the requirements of 40 CFR 280.

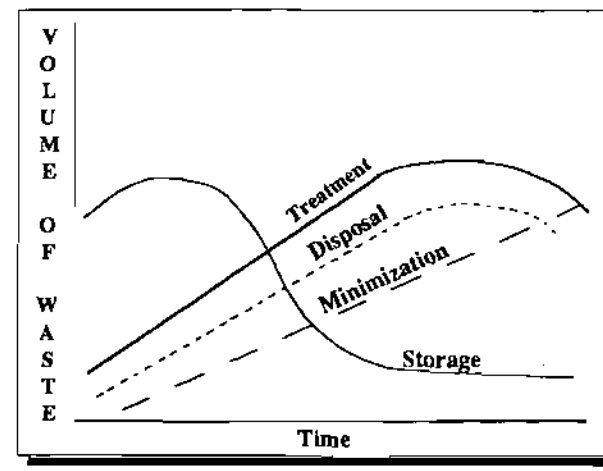
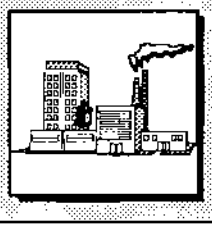


Figure 2.2.3.5. DOE's strategy for hazardous waste management includes avoiding waste generation and increasing waste treatment and disposal capabilities to reduce storage requirements.

2.2.3.6 OVERVIEW OF SANITARY WASTE PROGRAM ACTIVITIES



Many existing DOE sanitary waste facilities are aging and require improvements to bring them into compliance with current standards as well as to continue their current operation. Sanitary Waste Program activities will result in the minimization, regulatory compliance, treatment, and disposal of sanitary wastes.

There are essentially two types of sanitary wastes: solid sanitary waste and liquid sanitary waste. DOE facilities generate both liquid and solid sanitary wastes. Solid sanitary wastes are routinely generated by normal housekeeping activities. It is neither hazardous, as defined and regulated by RCRA Subtitle C and the Toxic Substances Control Act, nor radioactive. The solid sanitary waste is garbage which is disposed of in sanitary landfills. Disposal of these wastes is regulated under RCRA Subtitle D. Liquid sanitary wastes include sewage and industrial wastes, which are treated in wastewater and industrial wastewater treatment plants. Liquid sanitary wastes, like domestic sewage, undergo a wastewater treatment process before being discharged through the sewage system. The management of liquid sanitary wastes is regulated by the Clean Water Act.

Solid sanitary wastes are generally disposed of in onsite sanitary landfills, which are DOE owned-and-operated, or shipped offsite to publicly owned landfills for disposal. EM is responsible for the operation of DOE-owned solid sanitary waste landfills. EM is also responsible for disposal costs and tipping fees when such wastes are disposed of in non-DOE-owned landfills.

The liquid sanitary waste is usually treated in onsite sewage treatment plants and discharged through the sewage system. Pretreatment facilities for industrial waste and treatment facilities for sanitary sewer wastes are owned and operated by DOE at some sites, while at other sites, these wastes are managed in municipally owned systems. Industrial sanitary wastes usually undergo pretreatment and treatment processes before being discharged through the sewage system.

DOE's past achievements and planned future activities include the following:

- Idaho National Engineering Laboratory (INEL) is proposing a Sanitary Waste Transfer Station that will enable sanitary waste to be disposed of in a local municipal landfill. This activity will provide the interface between INEL and the local county for the disposal of sanitary solid waste in compliance with RCRA Subtitle D.
- Rocky Flats Office is proposing a Sewage Treatment Plant Upgrade, which will support the planning, design, and construction phases for upgrading the current sewage treatment plant to ensure compliance with the National Pollutant Discharge Elimination System (NPDES) permit and the NPDES Federal Facility Compliance Agreement.
- Oak Ridge Field Office (Y-12 Plant) is proposing the construction of a Steam

Plant Ash Disposal Facility that will bring the disposal of coal ash from the Y-12 Steam Plant into environmental compliance and provide additional landfill capacity for the disposal of sanitary/ industrial wastes generated by three Oak Ridge facilities.

- Nevada Test Site is proposing the Emplacement of Surveyed Fencing of Active Landfill, which will comply with the EPA Solid Waste Act and Nevada Administrative Code. These regulations require that sanitary landfills must be fenced and the shipments must be logged to control access and deposits and to protect public health.

EM is developing an agency-level plan for managing DOE sanitary waste. Once developed, the plan will provide EM with objectives and strategies for improving management of sanitary waste.

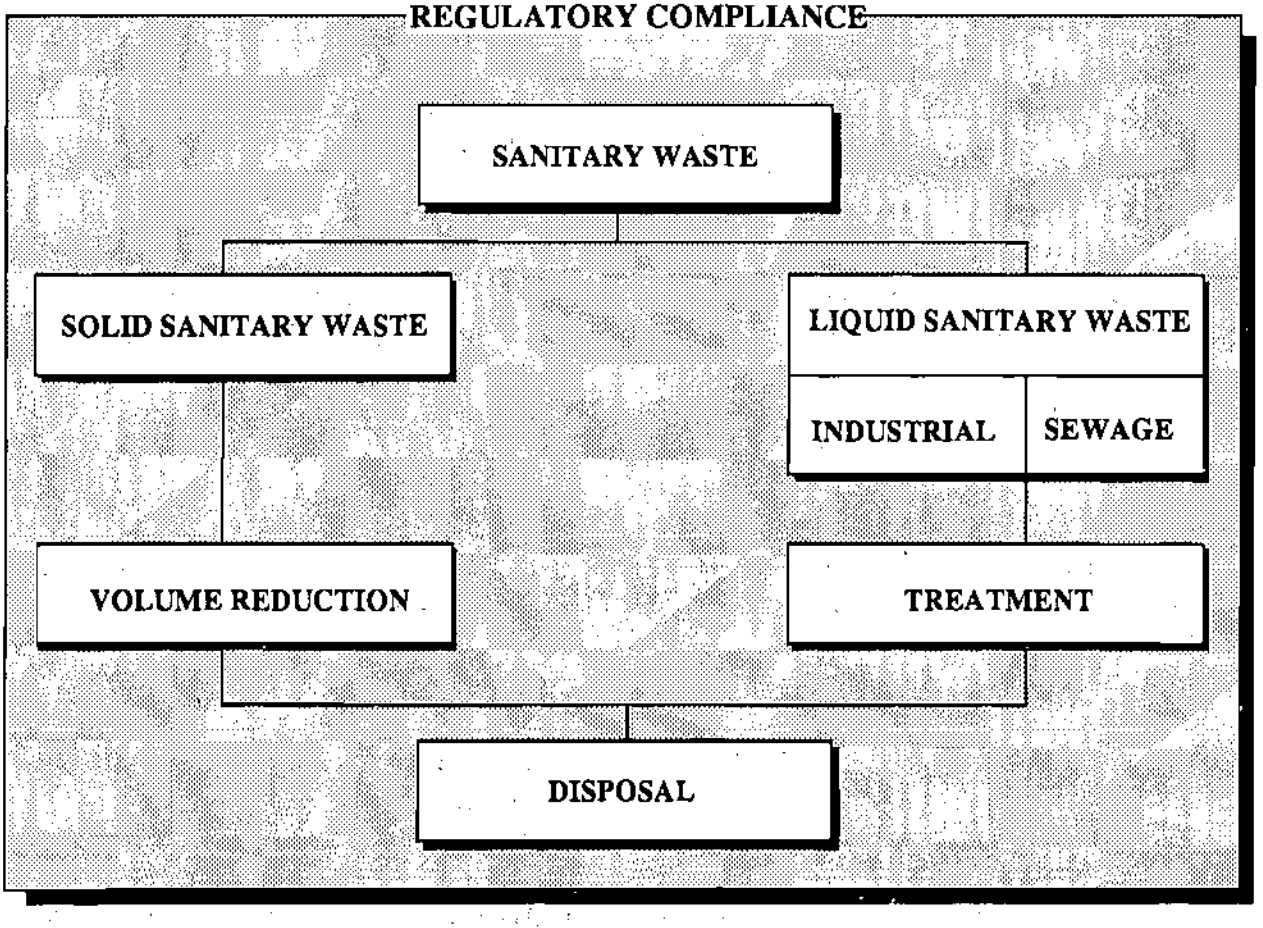
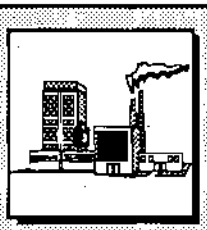


Figure 2.2.3.6. Volume reduction of sanitary solid waste will preserve limited disposal spaces, and treatment of sanitary sewage waste will result in compliance with regulatory requirements.

2.2.3.7 WASTE MINIMIZATION PROGRAM



DOE is making progress in waste minimization, but there is a substantial amount of work remaining to establish a fully functioning program.

It is the policy of DOE to incorporate national environmental goals in the formulation and implementation of its programs. As a result, all DOE program offices and field organizations will institute a multimedia waste reduction program. Waste reduction shall be accomplished by following a hierarchy of environmental practices. First, eliminate or minimize the generation of waste through source reduction. Second, recycle by reusing or reclaiming those potential waste materials that cannot be eliminated or minimized. Third, treat all generated waste to reduce volume, toxicity, or hazardous constituent mobility prior to storage or disposal. Minimization of present and future wastes will lessen the costs and liabilities associated with waste generation and management.

DOE has developed a multimedia waste minimization program, which is driven by the 1984 Hazardous and Solid Waste Amendments (HSWA), which amended RCRA. The program created its objectives of minimizing the generation and land disposal of hazardous waste by encouraging process substitution, materials recovery, properly conducted recycling and reuse, and treatment. However, DOE's waste minimization program is broader in scope than required by RCRA. The program, found in a series of DOE Orders, internal directives, and plans, applies to nonhazardous, hazardous, radioactive, and radioactive mixed waste. DOE Orders 5400.1, 5400.3, and 5820.2A mandate that the radioactive wastes and other pollutants be managed to minimize the generation of such wastes. The recently enacted Pollution Prevention Act of 1990 has broadened the RCRA/HSWA waste minimization policy to cover all forms of pollutant waste. The Act states that it is national policy to prevent pollution at the source and to recycle pollution in an environmentally safe manner whenever feasible.

In June 1990, a waste reduction policy statement was issued by DOE providing an umbrella for consolidating the requirements of DOE Orders for implementing either a waste minimization or a waste reduction program. It was the first step in developing a departmentwide waste minimization program. The implementation guidance for DOE Order 5400.1, attached to the policy statement, specified the requirements for a waste minimization program and plan. By May 9, 1990, each DOE site or facility responsible for generating hazardous, radioactive, or mixed waste submitted a waste minimization plan to Headquarters. The plans were reviewed, and an analysis report was published. Information from this review was used to generate a model waste minimization site plan. The model plan, the analysis report, and the appropriate reviews were returned to the field organization for reference in revising their plans for a 1991

submission. To help identify the nature and amount of waste generated from each process and to assist in the realization of effective waste minimization opportunities, DOE developed a guidance plan for conducting process waste assessments. The DOE Waste Reduction Steering Committee was formed in 1988 to more effectively coordinate the waste reduction activities for all Principal Secretarial Offices which manage waste-generating programs. The committee conducts site visits to review the status of waste minimization activities, assists in the development of guidance, and works to facilitate waste minimization information transfer throughout the DOE complex. Within EM's Office of Waste Operations, the Technical Support Division's Waste Minimization Branch provides coordination and program policy guidance for DOE's waste minimization programs. This branch provides guidance to field offices for the establishment of a comprehensive waste minimization program, required goal setting, and tracking and reporting systems for waste minimization. Semiannual workshops are held to assist the sites with program planning, waste minimization and reduction activities, and technology and information transfer.

A variety of programmatic and technical waste minimization activities are occurring throughout the DOE complex. Programmatic waste minimization activities include procurement procedures through inventory reduction techniques, use review, and hazardous materials tracking; employee training, awareness programs, newsletters, and award/incentive systems; and new process evaluations for waste minimization. Technical waste minimization activities include source reduction through materials substitution; waste stream segregation and process changes; and recycling of solvents, oils, metals, and paper.

The Department is working to establish reasonable quantitative waste minimization goals, improve reporting activities from the field, and issue guidance to help realize waste minimization opportunities throughout DOE.

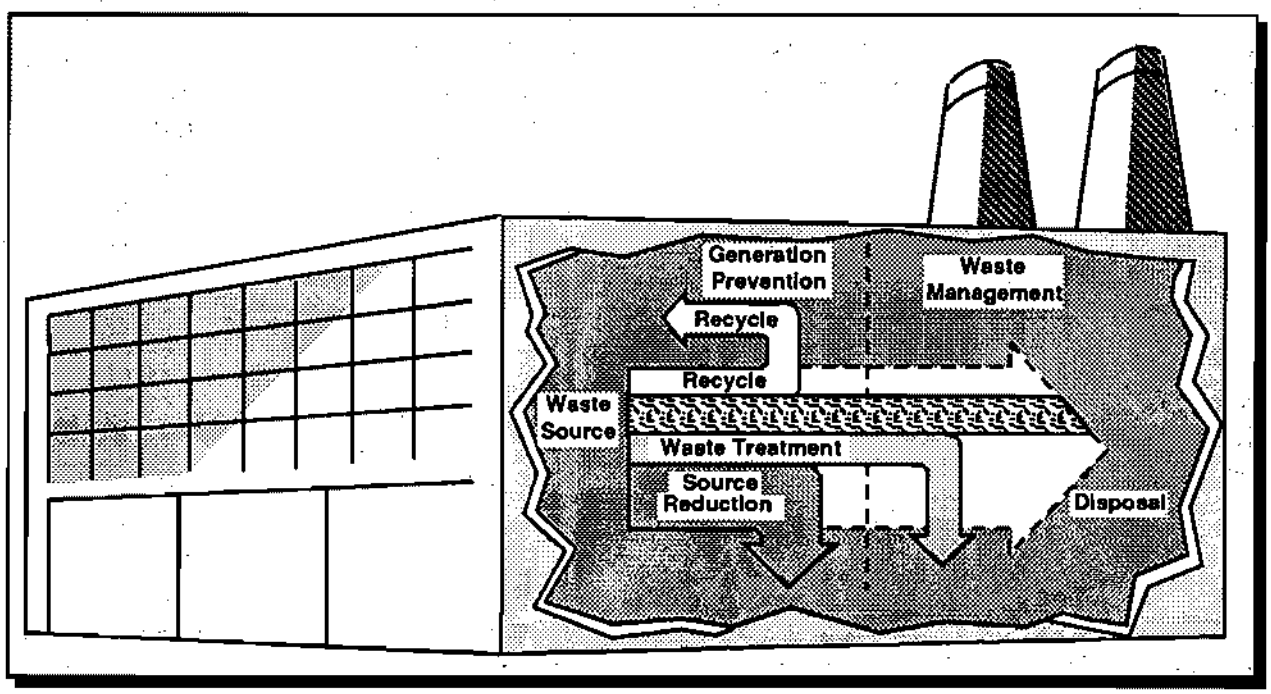
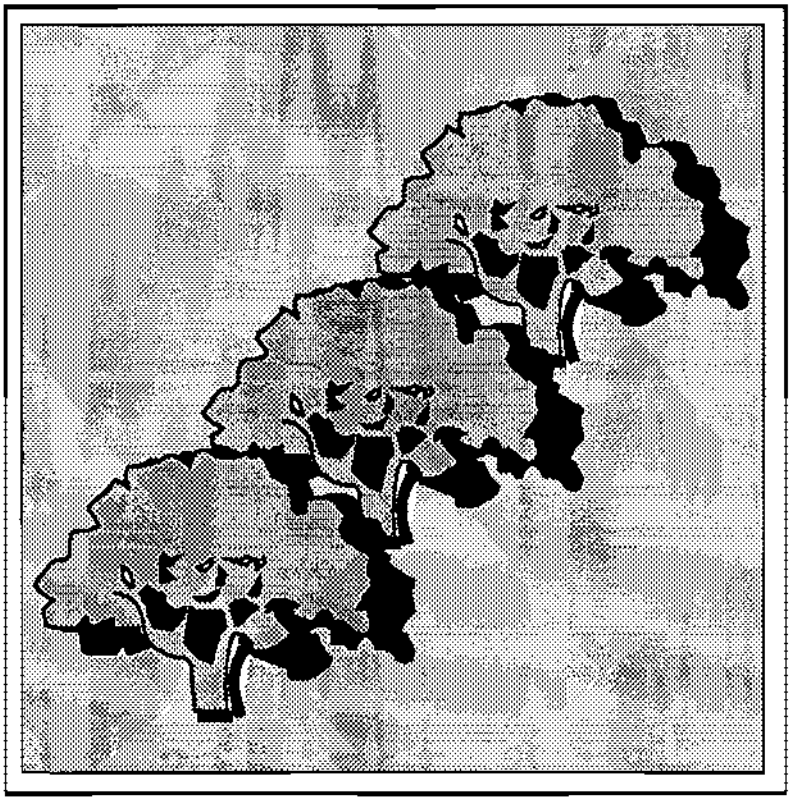


Figure 2.2.3.7. Implementing practices that reduce or recycle potential wastes at the source will decrease the amount of waste requiring treatment or disposal.

2.3

Environmental Restoration



2.3.1.1 ENVIRONMENTAL RESTORATION: BACKGROUND, SCOPE, REGULATORY REQUIREMENTS, CLEANUP STANDARDS, AND FUNDING

Past operations connected with DOE nuclear programs contaminated a large number of sites and facilities with radioactive, hazardous, and mixed wastes. Environmental Restoration (ER) is concerned with assessment and cleanup of such sites and facilities to comply with prescribed standards derived from Federal and State laws.

Background: Operations connected with DOE's nuclear complex involve the manufacture and processing of enriched uranium, reprocessing of spent nuclear reactor fuel and other irradiated materials, production and testing of weapons, development of reactors, and conduct of various research activities. These operations, dating in some cases from the 1940s, generated and disposed of large quantities of radioactive and nonradioactive wastes. The history of operations shows the existence of spills of hazardous substances and waste management and disposal practices that, under today's regulatory structure and knowledge of the effects of chemicals in the environment, are unacceptable. The Department recognizes that many release sites must be cleaned up and that a large volume of wastes associated with these sites must be properly managed. DOE policy regarding these matters is in full compliance with the letter and spirit of applicable Federal, State, and local health, safety, and environmental statutes. To support this policy DOE committed, in its FY 1991-1995 Environmental Restoration and Waste Management Five-Year Plan, to a goal of cleaning up its nuclear installations by the year 2019.

ER, an essential element of this goal, is concerned with all aspects of assessment and cleanup of facilities and sites that are no longer a part of active operations but are contaminated with transuranic, low-level, hazardous, or mixed radioactive and hazardous waste materials. Such activities were first connected with the production of nuclear weapons and materials for national defense but have more recently included programs for the development of nuclear electric power sources and for carrying out basic nuclear research activities.

Scope: ER consists of two sets of activities: remedial actions and decontamination and decommissioning (D&D). The remedial actions tasks encompass (1) site discovery, preliminary assessment, and site inspection; (2) site characterization, analysis of cleanup alternatives, and selection of remedy; (3) cleanup and site closure; and (4) site compliance monitoring. Although remedial actions may deal with surface water contamination or with tanks, buildings, or structures, most remedial actions activities are concerned with contaminated soil and groundwater. The number of hazardous substance release sites is estimated to be approximately 3,700. In addition, more than 5,000 vicinity properties are connected with the Uranium Mill Tailings Remedial Action (UMTRA) Project and the Formerly Utilized Sites Remedial Action Program. D&D is concerned with the safe caretaking of surplus nuclear facilities and either their decontamination or their complete

dismantling and removal. The D&D tasks encompass (1) surveillance and maintenance, (2) assessment and characterization, (3) environmental review, (4) engineering, (5) D&D operations, and (6) closeout. Although D&D activities may deal with soil and groundwater contamination, most D&D activities are concerned with facilities such as reactors, hot cells, processing plants, storage tanks, and other structures from which there have been no known releases.

Approximately 500 contaminated facilities currently are included under D&D. These facilities include sites that have been formally declared inactive, surplus to DOE needs, and identified for D&D. Additional DOE facilities will become inactive and surplus in the future and will require D&D. In the coming year, ER plans are to develop a comprehensive inventory of D&D facilities that will provide a better basis for long-range D&D planning.

Key Regulatory Requirements: For remedial actions, the principal regulatory requirements are those derived from the provisions of RCRA, CERCLA, the National Environmental Policy Act (NEPA), and the Uranium Mill Tailings Radiation Control Act of 1978. Remedial actions activities are further subject to important regulatory requirements imposed by various States in which the contaminated sites exist. Additional requirements are set forth in various DOE Orders, standards, and other guidance documents.

For D&D, activities are carried out in accordance with the provisions prescribed by NEPA and the Atomic Energy Act and requirements set forth in various implementing DOE Orders, standards, and other guidance documents. For facilities from which there have been releases or from which there is a potential for release, the provisions of CERCLA or RCRA also apply. State requirements are also applicable in certain instances.

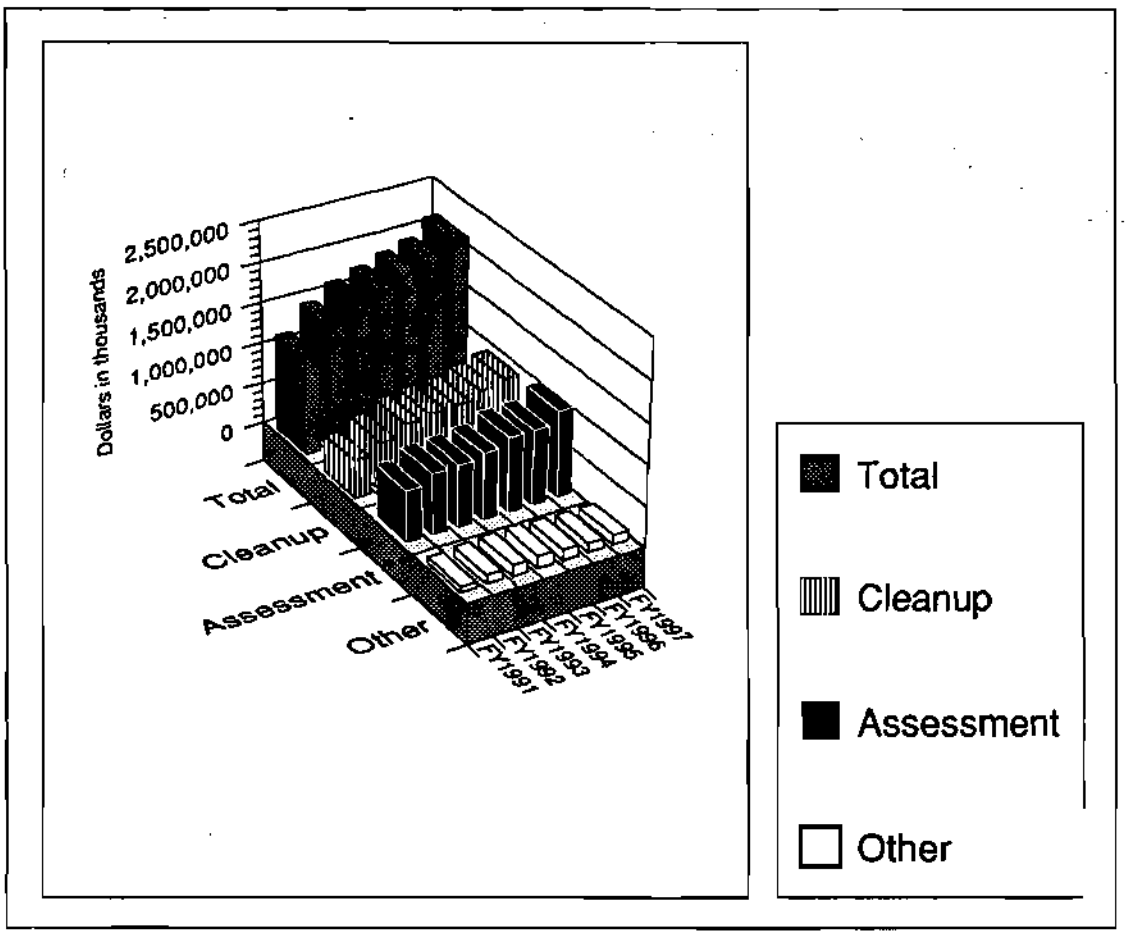
Cleanup Standards: For the inactive facilities and sites connected with ER, technical cleanup standards are derived primarily from the provisions of CERCLA, Section 121, "Cleanup Standards," codified by EPA in 40 CFR 300, Subpart F. Such provisions establish general criteria for selecting remedial actions and require compliance with standards from other environmental statutes (such as the Toxic Substances Control Act, Safe Drinking Water Act, Clean Air Act, and Clean Water Act) to the extent the standards prescribed under such other statutes are applicable or relevant and appropriate. Risk assessment techniques may also be used in establishing standards as a means of ensuring safe cleanup levels. State standards may be substituted for Federal standards if a State imposes requirements that are more stringent. CERCLA Section 121(d) identifies the circumstances for use of State standards.

For facilities and sites cleaned up under RCRA, the standards applied are derived in a manner similar to that used under CERCLA; that is, standards from other environmental statues are used, and risk assessment techniques are employed. RCRA requirements are codified by EPA, principally in 40 CFR 264, or, if a site may be closed under interim status, in 40 CFR 265. Under RCRA, States authorized to administer their own compliance programs may substitute State standards in lieu of Federal standards provided the State standards are at least as stringent as the Federal standards.

For sites being cleaned up under UMTRA, Project Cleanup Standards are codified by EPA in 40 CFR 192.

Funding Summary: Figure 2.3.1.1 provides the proposed Five-Year Plan funding profile for ER activities. This profile is based on the Validated Target Level as described in Section 1.2.4. The amounts for FY 1991 are those currently appropriated by Congress plus those authorized for reprogramming. Those amounts for FY 1992 correspond to the President's budget currently before Congress.

The amounts set forth in Figure 2.3.1.1 represent funds allocated to assessment and cleanup activities. Funds captured in the category labelled "other" include those to support (1) Compliance Oversight, (2) Landlord Functions, and (3) Program Support.

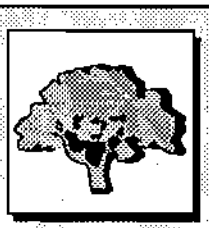


	FY1991	FY1992	FY1993	FY1994	FY1995	FY1996	FY1997
Assessment	647,614	765,769	786,828	831,017	939,345	942,155	1,082,008
Cleanup	458,646	599,972	738,822	774,727	800,550	892,130	948,378
Other	67,100	110,283	134,808	152,440	126,992	111,318	115,269
Total	1,173,360	1,476,024	1,660,458	1,758,184	1,866,887	1,945,603	2,145,655

(Dollars in thousands)

Figure 2.3.1.1. Total Environmental Restoration funding (Validated Target Level).

2.3.1.2 ENVIRONMENTAL RESTORATION GOAL AND STRATEGY



The goal for all Environmental Restoration (ER) activities is to ensure that risks to the environment and to human health and safety posed by inactive and surplus facilities and sites are either eliminated or reduced to prescribed, safe levels. A near-term bias for action and a program of technology development directed toward ER needs are essential elements of the strategy for reaching DOE's overall goal of cleanup by the year 2019.

ER Goal: The fundamental goal for ER is to ensure that risks to the environment and to human health and safety posed by inactive and surplus facilities and sites contaminated by radioactive, hazardous, or mixed wastes are either eliminated or reduced to prescribed, safe levels. It is a cornerstone of DOE's overall goal to clean up its nuclear complex by the year 2019. Although encompassing all requirements prescribed by applicable Federal, State, and local environmental statutes and regulatory requirements, this goal is not limited to regulatory compliance; that is, protection of human health and safety is of paramount concern to DOE. This goal is supported by continuing programs of essential technology development (Section 2.3.1.2.2). These programs are intended to provide improved techniques for dealing with contamination problems (i.e., more effective and more economical techniques).

DOE generally intends that facilities and sites be returned to a condition suitable for unrestricted use; however, in certain instances, in-place remedies such as stabilization followed by appropriate monitoring may be a preferred alternative. In-place remedies may offer advantages by (1) avoiding transportation risks and the potential for public exposure, (2) reducing risks associated with the handling of radioactive and hazardous materials, and (3) avoiding the need to develop new disposal facilities and sites. However, in all cases, selection of any remedies will require regulatory approval and will depend on (1) specific site conditions; (2) the type, nature, extent, and amount of contaminants present; (3) the availability of suitable stabilization technologies; (4) regulatory factors; or (5) other agreed-to considerations that may result from the remediation or public interaction processes.

Strategy: The overall strategy for achieving the cleanup goal is defined by separate sets of objectives established in connection with remedial actions and decontamination and decommissioning (D&D). With respect to remedial actions, the objectives are to (1) identify inactive contaminated nuclear facilities and sites, (2) assess these facilities and sites to determine the nature and extent of contamination, (3) confine and contain existing contamination to the extent necessary for minimizing its further spread, (4) provide for negotiated agreements with regulatory authorities to define the requirements and achievable schedule for the cleanup of these facilities and sites, (5) ensure that cleanup is carried out in strict accordance with these agreements, and (6) undertake long-term monitoring to ensure continuing compliance. The objectives

associated with D&D are to (1) maintain facilities awaiting either decontamination or decommissioning in a manner that limits worker, public, and environmental exposure to potential hazards; (2) assess such facilities to determine the nature and extent of contamination; (3) decontaminate facilities when appropriate in compliance with approved health and safety standards; and (4) decommission all other facilities in accordance with the requirements set forth in an approved environmental compliance plan.

Near-Term Strategy: Although the strategy prescribed for ER provides a sound approach to carrying out the program set forth in this Plan, several uncertainties have the potential for adversely impacting ER activities. These revolve around broad issues connected with (1) the degree of assessment required before start of cleanup, (2) the potential for further environmental degradation that can result from assessment activities, (3) the lack of industrial laboratory capacity to support the sample analyses required as a result of the assessment process, and (4) the lack of industrial capacity to clean up the wide range of contaminants and conditions posed by DOE's sites and facilities. DOE will continue to monitor this issue and take appropriate action whenever possible to mitigate impacts on the ER activities. ER will also do strategic planning for remedial action and D&D projects to support the overall cleanup goal of sites within the current inventory by 1991.

Another near-term strategy to be adopted for ER is built around the concept of a "bias for action"; that is, sufficient assessment must be done to determine whether a near-term risk exists to human health and safety or the environment. If such a risk exists, sufficient cleanup action must be undertaken immediately to abate the near-term threat; if no risk exists, then continuing assessment and subsequent cleanup can be placed on a longer schedule. Such immediate cleanup may not address all aspects of site contamination but would address that portion posing the near-term risk. After abating the immediate threat, further assessment and cleanup can be undertaken on a longer schedule.

This strategy, the basic elements of which were set forth by EPA in connection with Superfund,[1] makes it possible to attack the highest risks first, removing the sources of immediate threat in a logical and systematic manner, and then turning to remaining long-term contamination according to a priority basis. This strategy (1) allows the capacity of the system to grow while dealing more effectively with near-term risks; (2) provides time for development of new, cost-effective technologies for dealing more effectively with remaining cleanup needs; and (3) ensures that scarce resources, both human and financial, are targeted at real, present problems while avoiding their expenditure on less immediate needs.

[1]Reilly, William K., "Management Review of the Superfund Program - Ninety-Day Study." EPA 540/8-89/007, U.S. EPA, Washington, D.C., August 1989.

2.3.1.2.1 APPROACH TO MANAGING ENVIRONMENTAL RESTORATION ACTIVITIES

Managing Environmental Restoration is accomplished by defining and controlling technical, schedule, and cost baselines.

Management of the Environmental Restoration Program is to be exercised by control of approved program baselines to establish, for each major element, a set of goals against which progress and expenditures are measured and controlled. The process includes (1) program formulation, (2) program execution, and (3) program evaluation. Program formulation is the development of a set of discrete performance requirements and resources to manage and carry out activities within specified time frames. Program execution activities include implementing, monitoring, and performing approved program baselines. Program evaluation involves assessing progress and variances from the plan, identifying issues and problems, and administering corrective action.

This overall approach to management of the Environmental Restoration Program is intended to be consistent with DOE Order 4700.1, "Project Management System"; SEN-25-90, "Strategic Planning Initiative"; SEN-27-90, "Strengthening the Department of Energy Project Management System"; and DOE Notice 4700.4, "Baseline Change Control Process at the Executive Level."

The approach is characterized by (1) identification of basic program technical requirements; (2) specification of a systematic process for program development; (3) formal specification of cost, schedule, and technical program baselines; (4) specification of allowed variances from the approved program baseline; (5) regular reporting and assessment of status against the baseline; and (6) corrective management action (which may include baseline revision) in the event a variance exceeds a prescribed threshold.

Program baselines consist of three elements: (1) a technical element that specifies the nature, extent, and content of performance requirements; (2) a schedule element that identifies the key events and prescribes their timing; and (3) a cost element that sets forth the cost estimates needed to complete key events to accomplish performance requirements. Approved baselines will serve as planned commitments against which progress is measured and management control is exercised. Baselines will be included in program planning documentation, and changes to baselines will be managed in accordance with formal change control procedures.

As summarized in Figure 2.3.1.2.1, the process for managing Environmental Restoration provides for structure, documentation, and formal procedures related to planning, budgeting, executing,

and evaluating the status of program activities on an ongoing basis. The approach ties planning, technical, and scheduling elements to budget constraints and to the status of actual work. It supports management status reporting needs by providing the periodic summary reports necessary for managers to monitor, control, and revise program baselines.

Using this approach, managerial functions are carried out at two levels: at Headquarters and in the field at individual field office installations. Headquarters responsibility encompasses three principal sets of activities: (1) policy development and program planning, (2) budget formulation, and (3) program management. With respect to field office installations, the scope of management responsibility consists of four principal functions: (1) planning required activities to be accomplished, (2) identifying issues and decisions related to required activities, (3) formulating schedules and estimating costs, and (4) managing required activities and resolving issues by identifying decision milestones at both Headquarters and field office levels of authority.

To exploit expertise and experience available at particular DOE facilities, DOE Headquarters convenes National Environmental Restoration Program Managers' meetings from one to three times per year. These meetings include presentations and workshops on management, technical and regulatory issues, and tours of the host facility's sites.

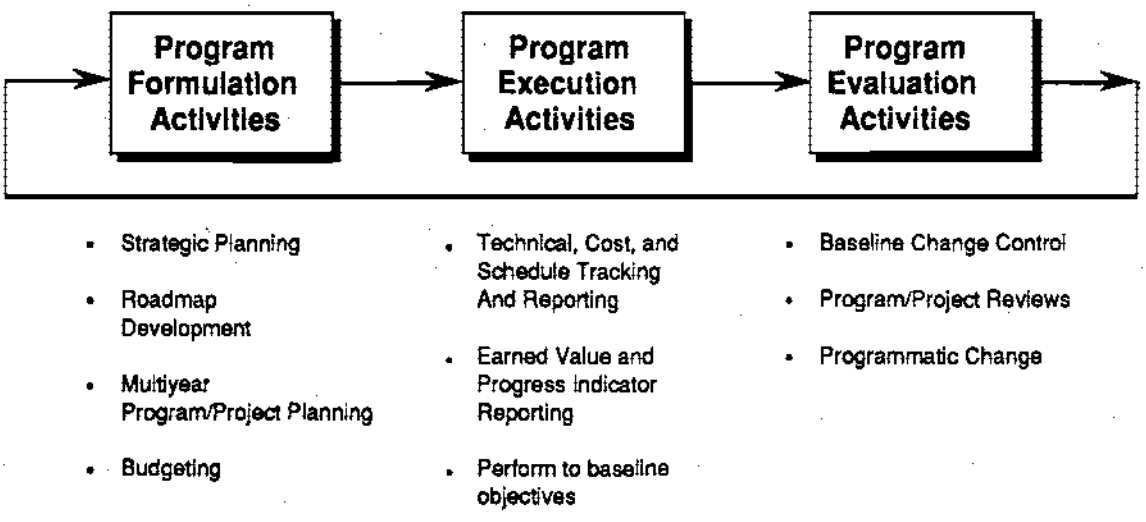


Figure 2.3.1.2.1. The process for managing Environmental Restoration provides structure for planning, execution, and evaluation of the status of program activities and issues on an ongoing basis.

2.3.1.2.2 MEETING THE NEED FOR NEW TECHNOLOGIES: INTERFACE WITH THE OFFICE OF TECHNOLOGY DEVELOPMENT

Clearly defined, sharply focused, mutually supported tasks to address technology deficiencies will provide the means to more effectively, expeditiously, and economically accomplish cleanup goals.

The Office of Environmental Restoration (ER) and the Office of Technology Development (OTD) are working together to restore the environment at DOE sites. ER develops clearly stated, sharply focused strategic and technical approaches for the restoration and monitoring of every contaminated site in the DOE complex. ER also determines the adequacy of available cleanup technology to meet its needs and identifies deficiencies associated with available technology.

OTD develops new characterization and cleanup technologies and makes significant modifications to existing technologies to remedy technology deficiencies associated with ER. OTD ensures that DOE applies the best technology available from the private sector, universities, and other government agencies. It also takes the lead in ensuring adequate demonstration of proposed technologies to secure regulatory acceptance. Technology Development uses a full-scale systems approach to ensure cradle-to-grave applicability and accelerated implementation of new technology. This development is managed primarily through Integrated Programs and Integrated Demonstrations as discussed in Section 2.4.1.2.

The interface between ER and OTD deals with the definition of goals and objectives, communication of these goals and objectives, clarification of expectations, and monitoring of progress toward meeting those goals.

Focusing on ER Technology Needs: ER priorities are extensively reviewed and validated using the system described in Section 2.3.1.2.4. The needs for new and improved technologies to carry out priority restorations were identified during a recent, extensive assessment of ER technologies. The assessment was used to collect and prioritize the needs identified at the installation level for various planning efforts, including roadmaps. Significant deficiencies in the technologies for characterization and for restoration of DOE sites were identified during this assessment. OTD has activities that are expected to remedy these deficiencies. The assessment will be reviewed annually on a schedule integrated with OTD's formulation of field guidance for Research, Development, Demonstration, Testing, and Evaluation (RDDT&E).

Enhanced Communications: Enhancement of communications between personnel in OTD and ER is another priority. A Technology Exchange Briefing series was inaugurated to enhance communication between organizations. Personnel in ER thereby understand the activities sponsored

by OTD. In a similar manner, personnel in OTD come to understand facility and contaminant conditions and the cleanup needs that exist in the field.

A technology management responsibility has been organized within ER to formalize ER's interface with OTD. This responsibility provides the system for the management of day-to-day operations of ER with OTD and of such key activities as the identification of ER technology deficiencies, the reviews of OTD field guidance, and coordination of technical and program reviews between ER and OTD counterparts at Headquarters and in the field.

OTD Tasks: Each OTD task is correlated with specific, priority technology deficiencies. The tasks managed by OTD address critical ER technology deficiencies in a timely manner and will provide results that meet the basic requirements of ER for technology development and transfer, including the requirement for acceptability to the regulatory community. OTD reviews these tasks with ER to ensure that they address critical restoration needs.

Integrated Demonstrations comprise a major part of the OTD program, and the vision, goals, and expectations of each Integrated Demonstration must be widely understood. This understanding is achieved through the work of broad-based planning teams, which include personnel from ER as well as other interested parties.

Program Accountability: Accountability of OTD to ER comes through regular program reviews and written reports that discuss the technical issues, progress on dealing with those issues, and the prognosis for success. OTD currently has field review of programs as needed, at midyear and at year-end.

Reports and reviews generate confidence that new technology will be available in a timely way for ER use in the case of successful tasks. The reports and reviews also document setbacks and negative results to provide an opportunity for ER to develop alternative cleanup strategies when new technology will not be available as planned. Because many of the OTD activities are designed to cut across several sites, broad Headquarters and field office participation is required. Separate reviews are conducted at several levels of technical detail for audiences with different responsibilities. The reviews also provide a forum for discussion of the issues, for development of mutual trust and understanding, and for development of cooperation.

2.3.1.2.3 LESSONS LEARNED FROM PROGRAM COST REVIEWS

Program Cost Reviews (PCRs) conducted by Environmental Restoration (ER) for the FY 1993 - 1997 Five-Year Plan give a better understanding of the realism and accuracy of current estimates and schedules for assessment and cleanup activities.

Objectives: As the EM program matures, increased realism and accuracy of cost and schedule estimates will be required to properly manage the program. Cost reviews were conducted at each field office as part of an overall plan to improve cost and schedule baselines. The review process provides an independent assessment of the current project management system of each field office by evaluating the process for developing estimates and schedules for assessment and cleanup activities. The goal of the review is to improve the basis and, ultimately, the accuracy of the cost estimates.

The Process: The reviews were planned and scheduled by the Program Support Division and conducted at each field office by teams consisting of a Headquarters program manager, a trained cost analyst/estimator, and technical support personnel. Twelve ER teams were assembled and trained to ensure that a consistent approach was taken.

Before the review, each Headquarters' program manager organized the field visits while the team reviewed applicable activity data sheets (ADSs) and other background material. The fixed agenda for each review called for a field office presentation on its cost and schedule estimating process. These presentations covered topics such as current written guidance, capabilities of cost estimate development groups, sources of information, current cost and schedule control systems, summaries of procedures, and future plans. Three to 4 days of detailed reviews followed these presentations.

A checklist was completed for each ADS reviewed, documenting results in the three objective areas (Figure 2.3.1.2.3). Reviews of estimate documentation and traceability focused on factors such as the use of a Work Breakdown Structure, schedule realism, and contingency analysis. The degree of detail was considered part of the basis of the estimate and led to a determination of overall estimate accuracy. Review teams also evaluated areas of the ER Program requiring coordination with technology development.

Field offices were given an exit briefing by the review team upon departure. A written report was prepared and circulated within the review team and was forwarded to the field to incorporate comments into its Five-Year Plan submittal. A draft comprehensive report and executive summary was subsequently prepared for Headquarters.

Lessons Learned: ER learned a number of general lessons from the review process. Although cost estimate quality and detail varied considerably among and within sites, many findings were common to all.

- Estimated documentation for many projects needs improvement: Because of the early stage of project development, many estimates lacked detailed backup documentation. For example, many activities that begin in the 5-year period covered by the current plan are contingent on milestones such as the Record of Decision. Even though many project details are not yet known, the assumptions on which these estimates are based need better documentation.
- Focused policies, procedures, and guidance will improve consistency, accuracy, and traceability: Improved guidance, issued as early as possible and remaining stable throughout the budget process, will assist the field in improving the quality of cost and schedule estimates.

The PCRs identified opportunities for both short- and long-term improvements in technical, administrative, and policy issues that affect project cost estimates and schedules. Additional improvements will be realized in future years as feedback from the PCRs is integrated with the other EM initiatives, described in Section 1.4.5.4, to support an ongoing, broad-based cost improvement program.

Estimate Checklist Components

Estimate Documentation and Traceability	Define Basis of the Estimate	Areas for Cost Improvement
• Discuss documentation supporting the estimate • Discuss estimate traceability • Discuss sources and credibility of cost information	• Establish assumptions used to develop estimates • Review uncertainties surrounding activity scope • Discuss scope uncertainty reduction measures	• Discuss areas for reducing costs or shortening schedules • Discuss technology or institutional factors that could improve costs

Figure 2.3.1.2.3. Checklists completed for each ADS reviewed ensured a consistent assessment of three objective areas.

2.3.1.2.4 PROGRESS IN DEVELOPING THE RISK-BASED PRIORITY SYSTEM

The DOE Environmental Restoration (ER) priority system is being used in developing the allocation of FY 1993 funds to competing demands posed by all ER activities.

In consultation with outside parties, DOE has developed and is beginning to use a risk-based priority system to aid in determining the order in which ER activities should be conducted and in formulating and allocating annual budgets for cleanup.

Meeting Essential, Multiple Objectives: This priority system is useful because it:

- places highest priority on meeting DOE's two chief ER - EM objectives: reducing risks to public health and the environment and reducing uncertainty about the nature and extent of contamination problems;
- ensures that activities to address emergencies are quickly identified and funded;
- incorporates and gives weight to public values and concerns in making technical/ social decisions;
- gives priority to activities that are most likely to be effective in solving problems;
- gives priority to activities that make best use of limited funds;
- enables objective comparison of the competing demands of different sites;
- responds to regulatory concerns and requirements;
- enables stable, long-range planning for environmental cleanup; and
- uses sophisticated statistical methods expressly designed to manage large amounts of data and to aid in making decisions to meet multiple, competing, and sometimes conflicting objectives.

Identifying Emergencies: Field office program managers, with input from the public groups, placed activities into three classes:

1. Emergency activities — actions or studies needed to prevent serious, immediate threats to public health.

2. Time-critical activities — actions or studies to address problems that must be acted on or studied soon, but not necessarily before the fiscal year for which the budget is being planned.

3. Other high-benefit and time-sensitive activities — activities to prevent potential future problems, activities required by regulations or statutes, or action needed to achieve ER objectives.

Emergency activities (Class 1) are funded immediately without going through the priority system process. Time-critical activities (Class 2) are ensured of funding in the annual budget being prepared.

Establishing Priorities for Less Urgent Activities: The system ensures that Class 2

activities are funded and prioritizes Class 3 activities to help ensure that the most necessary, effective, and efficient activities are funded and conducted first. Field office program managers group the activities into alternative sets of activities, or budget cases, showing what they could accomplish at varying funding levels. They score these cases, in a prescribed process, based on how well the cases meet certain stated objectives. Headquarters managers review the scores and then aggregate them, using a mathematical formula, to show which combination of cases represents the best way to use finite funds to obtain the highest possible benefit. After the ER budget request is prepared, DOE uses the system to explain its requests to the Office of Management and Budget and to Congress during budget negotiations and to allocate the funds Congress actually appropriates.

It is important to note that the priority system aids decisions but does not make them, and other factors are also considered in final decisions. An overview of the process is provided in Figure 2.3.1.2.4.

Building Consensus: DOE has consulted a wide range of outside parties, including representatives from State and Tribal governments, national environmental groups, EPA, and independent technical experts. Their comments on a preliminary report, along with experience from the system's partial application during the FY 1992 budget process, have contributed to the current revision of the system. The priority system is being used in the FY 1993 budget process and is ready for broad review. A notice will be published in the *Federal Register* in early summer requesting comments about the priority system during a 60-day comment period. Internal DOE and external groups (stakeholder groups and technical peer review groups) are being asked to review the system. Based on the comments, reviews, and the experience gained in using it, DOE will publish a revised version of the priority system in fall 1991.

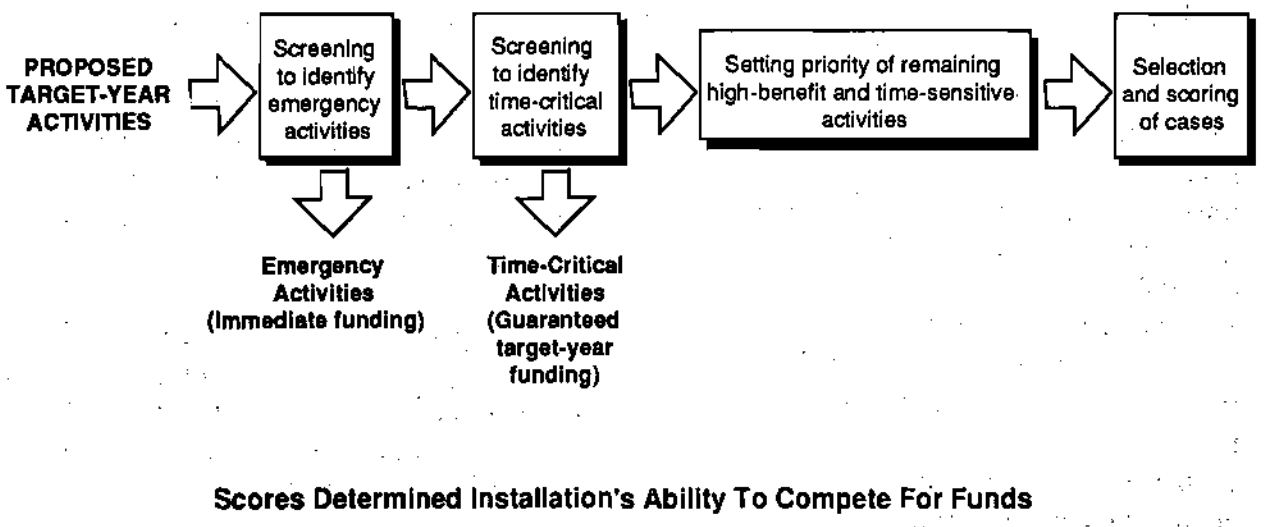


Figure 2.3.1.2.4. Overview of the priority system screening/scoring process.

2.3.2 SUMMARY OF ENVIRONMENTAL RESTORATION ACCOMPLISHMENTS SINCE THE FY 1992-1996 FIVE-YEAR PLAN

Every DOE field office has made progress toward environmental restoration since the FY 1992-1996 Five-Year Plan, and valuable lessons have been learned.

Environmental Restoration Accomplishments: The Environmental Restoration Program made significant strides toward accomplishing its mission of planning, investigating, and executing remediation of the many nuclear-related facilities for which DOE has responsibility. The number of agreements between DOE, the States, EPA, and Indian Tribes continued to increase and formalize the relationship between the various concerned parties. The Environmental Restoration Program showed marked improvements in developing and establishing the various program activities by taking advantage of the lessons being learned in each phase.

Planning: The formalization of the planning for Environmental Restoration Program activities showed great progress in each area of the program. Headquarters (HQ) planning activities included the issuance of a Costestimating Guidance Handbook and the initiation of HQ cost estimating reviews at each field office to establish the traceability and basis for all cost estimates. HQ management plans are being developed, and the HQ organization made strides toward achieving the full staffing required to provide the HQ management and oversight required. Each field office moved toward the establishment of a formalized planning and management process that will achieve compliance with the requirements of DOE Order 4700. In addition, each field office moved toward having a complete technical plan in progress to guide the program. Numerous planning documents have also been sent to the appropriate regulatory bodies in compliance with the requirements of their existing agreements with DOE to permit the required regulatory oversight.

Agreements: DOE continued to successfully negotiate the interagency agreements required with the various EPA Regions and State regulatory agencies. As these agreements have been negotiated, they have been implemented at the corresponding sites to ensure that the appropriate regulatory bodies have the required involvement in the Environmental Restoration Program decision process. These agreements also serve to define the commitments that DOE has made to achieve the remediation of facilities contaminated by previous activities.

Accomplishments: The accomplishment of the major milestones presented in the FY 1992 - 1996 Five-Year Plan are found in the individual Installation Summaries located in Section 3.

As is appropriate for a developing program, many of the accomplishments were the completion of assessments of potential environmental releases and the identification

of risks that could be associated with those releases. Several hundred such assessments will be completed by the end of FY 1991. As these assessments have been completed, it has been possible for DOE to begin to focus its resources on those of greatest risk. It has also been possible to identify those situations that would benefit from interim remedial actions. In addition, many of the accomplishments involved the completion of activities that will finalize RCRA Facility Investigations (RFIs) or the Remedial Investigation/FeasibilityStudy (RI/FS) process. These studies will provide a determination of the nature and extent of any environmental hazards, the risks associated with those hazards, the cleanup standards to be applied, and the development of the actual remedial actions to be taken to eliminate or greatly reduce these risks.

The Environmental Restoration Program has also completed actions in the past year to mitigate known problems or has taken interim actions to mitigate such problems until the appropriate process (RFI/Corrective Measures Study or RI/FS) can be completed and a determination of the final remedial action made. DOE is also taking advantage of the knowledge gained in accomplishing each of these actions to better and more quickly address the remaining restoration concerns. For example, DOE completed the remediation of four additional Uranium Mill Tailings Remedial Action (UMTRA) sites and 654 UMTRA vicinity properties during the past year, bringing the total completed to 8 and 4,088, respectively. During the past year, 16 million gallons of groundwater were extracted and successfully treated at the Lawrence Livermore National Laboratory.

At Hanford, liquid was removed from the 183-H Solar Evaporation Basin and solidified. The resulting solidified material filled 12,000 drums.

A total of 36 RCRA closures were completed at various locations across the complex.

A total of 29 interim actions were begun or completed over the entire complex.

The Test Area North injection well sludge cleanup at the Idaho National Engineering Laboratory was completed.

Decontamination and decommissioning of more than 10 facilities was completed at 4 field sites.

The design of a bioreclamation system for diesel fuel products in groundwater and soils at the Oak Ridge K-25 Site was completed.

Integrated Demonstrations for remediation of volatile organic contamination in the vadose zone were successfully completed at Savannah River.

More than 35 inactive underground storage tanks were removed at 4 field sites.

2.3.3.1 HEADQUARTERS OVERVIEW

DOE Headquarters (HQ) activities will greatly enhance the ongoing Environmental Restoration (ER) Program.

In addition to managing ongoing ER activities by controlling overall program direction and execution, DOE HQ is developing and implementing various new plans, strategies, and policies designed to improve the capabilities of HQ and field offices to meet internal and external expectations of progress toward the goal of cleanup by 2019. These initiatives, which relate to key elements of ER, are summarized below.

Management Plan: A new management plan has been developed for the Office of ER. This plan identifies top-level management strategies and responsibilities and mechanics of program implementation, including planning, budgeting, execution, and reporting. The plan clearly delineates HQ and field office responsibilities. This new plan, developed and implemented in conjunction with plans for the Office of Waste Operations and the Office of Technology Development, will provide uniform guidance to all elements of the Office of ER involved in the cleanup of inactive facilities and sites.

Public Involvement: A significant effort has been made to provide opportunities for active public participation in the ER Program. The public is encouraged to participate in the identification and resolution of issues, the assessment of alternatives, and the establishment of priorities. Outside public organizations that routinely participate in ER programs include the State and Tribal Government Working Group, the Stakeholders' Forum, and the External Review Group.

Application of a Risk-Based Priority System: As described in detail in Section 2.3.1.2.4, a risk-based priority system will be used to develop the ER budget request for FY 1993. This task requires a significant effort by HQ and field offices to develop necessary inputs to the system.

Technology Needs Assessment: As described in Section 2.3.1.2.2, the Office of ER performed an extensive needs assessment. This input into the Office of Technology Development planning process will be updated annually.

Program/Project Tracking System: An effort is under way to develop and implement a new tracking system. The key use will be to provide managers with activity costs, schedule, and scope information based on consistent units of measurement. Reports will provide monthly project management information, earned value calculations, and trend analysis.

ER Alternate Contracting Strategy: The Office of ER is developing a management

contracting strategy to provide each DOE field office with assistance in accomplishing ER activities by providing each field office with an ER Management Contractor (ERMC). The intent of the strategy is to bring contractors with extensive CERCLA and RCRA experience into the DOE system to enhance the overall management and cost-effectiveness of the ER Program. These contractors will also serve to reduce potential conflicts of interest in restoration activities that may exist with the existing management and operating contractors at the various DOE operations.

The strategy will be implemented in a phased approach with the Richland Field Office and the Feed Materials Production Center having the initial ERMCs. The experience gained in these initial contracts will be incorporated into the ERMC strategy as additional contracts are placed at the remaining field offices. In addition, DOE HQ will have an information management integrating contractor to assist EM HQ in the collection of information on field activities and the preparation of reports required for EM HQ to manage the ER Program. This ERMC strategy enables DOE to provide optimum management of the DOE ER Program with a stronger, more independent team.

Quality Assurance/Self-Assessment: An ER QA Program is being developed as part of the ER Management Plan. The QA Program is based on a "bottoms-up" review of ER work activities and an assessment of which of these activities affect quality. A QA Program document and appropriate implementing procedures are being prepared for formal approval.

A Self-Assessment Program for management of ER environment, safety, health, and quality activities is being developed to implement SEN-6B and the Secretary's guidance memorandum on self-assessment, dated July 31, 1990. This program will be integrated into the assessment activities being performed by other DOE organizations at HQ, field offices, and DOE contractor facilities.

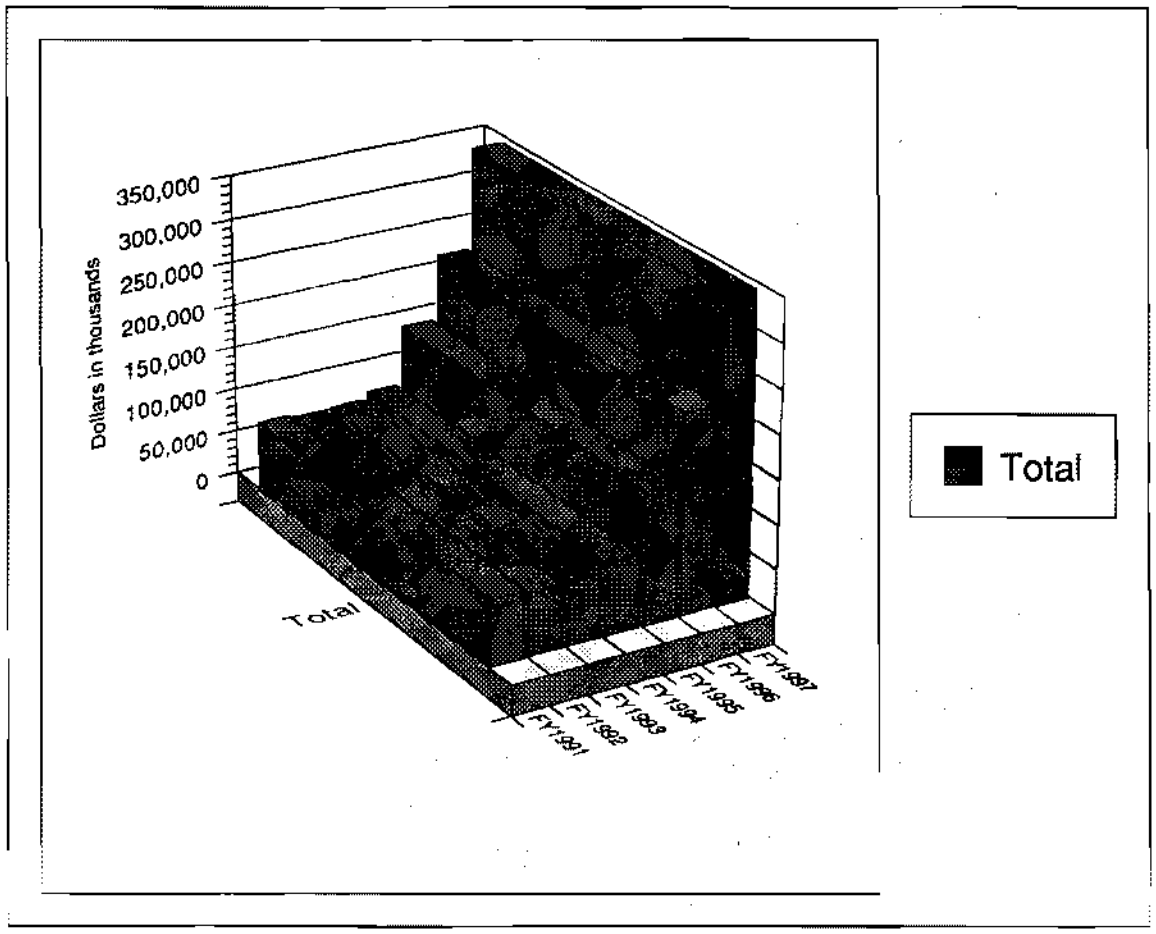
Participation in External Groups: ER is an active participant in several interagency groups that provide an opportunity to exchange valuable information with other organizations sharing common concerns. These groups include the Federal Remediation Technologies Roundtable; The Keystone Project (Federal Facility Priority Setting); the Interagency Cost Estimating Group for Hazardous, Toxic, and Radiological Waste Remediation; and the Interagency Committee on Hazardous Waste Cleanup Contracting Strategies.

Establishing a Risk Baseline: The Department recognizes the need to have an independent group review the ER risk baseline. Therefore it is discussing with the Agency for Toxic Substance and Disease Registry (ATSDR) options for conducting health consultations. Possible tasks would be to perform a complexwide overview of the ER projects to address (1) whether there are any current exposures that require emergency action and (2) whether there are any time-critical problems. We expect to be able to have ATSDR or another suitable group perform these consultations in 1991 and 1992. These consultations would be in addition to the quantitative judgements about levels of potential future risk, which will be or have been made.

Programmatic Environmental Impact Statement (PEIS): The ER Program has lead responsibility for preparing the ER and Waste Management PEIS. The document will be the Department's long-range policy

and strategic plan for conducting its activities. For further information, see Section 1.3.6.2.

Figure 2.3.3.1 provides anticipated funding needs for DOE HQ ER activities.



	FY1991	FY1992	FY1993	FY1994	FY1995	FY1996	FY1997
Total	75,221	70,494	73,212	81,840	151,367	226,735	344,472

(Dollars in thousands)

Figure 2.3.3.1. HQ environmental restoration funding (Validated Target Level).

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2.3.3.2 ALBUQUERQUE FIELD OFFICE OVERVIEW

DOE Albuquerque Field Office (AL) is fully committed to the assessment and cleanup of problems resulting from its inactive waste management units and facilities. AL demonstrated this commitment in 1984 with the establishment of a program to address inactive release sites.

AL established the Comprehensive Environmental Assessment and Response Program (CEARP) in 1984 to identify, assess, and correct actual/potential releases at AL installations. By 1988, CEARP was incorporated into the Environmental Restoration Program. Currently, environmental restoration activities at AL consist of the Environmental Restoration Remedial Action Program, the Decontamination and Decommissioning (D&D) Program, and the Uranium Mill Tailings Remedial Action (UMTRA) Project.

The primary objective of the AL Environmental Restoration Remedial Action Program is to identify and restore inactive release sites at its installations. The program is being implemented at the Kansas City Plant, the Los Alamos National Laboratory, the Mound Plant, the Pantex Plant, the Pinellas Plant, Sandia-Albuquerque, Sandia-Livermore, South Valley, and the Inhalation Toxicology Research Institute (Energy Research Facility). The two primary acts governing assessment and cleanup of inactive release sites are RCRA and CERCLA.

The fundamental responsibility of DOE's D&D Program is to protect the public and the environment from potentially harmful contamination (radioactive and hazardous) at surplus DOE facilities. To that end, AL conducts surveillance, maintenance, and D&D of those facilities within the AL complex. The D&D of inactive facilities complies with the intent of Executive Order 12088, "Federal Compliance with Pollution Control Standards"; DOE Order 5480.1B, "Environmental Safety and Health Program for Department of Energy Operations"; DOE Order 5820.2A, "Radioactive Waste Management"; and CERCLA.

The Uranium Mill Tailings Radiation Control Act of 1978, Public Law 95-604, authorizes DOE to undertake remedial actions at 24 designated inactive uranium processing sites and 5,000 vicinity properties. The purpose of this remedial action is to stabilize and control uranium mill tailings and other residual materials in a safe and environmentally sound manner to minimize hazards to the public. FY 1991 funding was received to initiate the Uranium Mill Tailings Groundwater Restoration Project that will clean up groundwater at UMTRA sites, where required.

Past operations in support of DOE's production missions at AL facilities left a legacy of radioactive and hazardous waste problems that must be rectified. Most of the problems being addressed in the environmental restoration category are the result of past waste management practices

that, although considered acceptable at the time, do not meet today's more stringent standards for protection of human health and the environment.

During the 6 years of the AL program, more than 2,000 potential release sites across the AL complex have been identified as needing further assessment and/or cleanup. In addition, 22 surplus facilities are included in the D&D Program for surveillance and maintenance or final decommissioning.

The types and extent of contamination vary from one place to another. Section 3 describes in more detail the problems, status of environmental restoration activities, and risks for each installation in the AL complex. In general, the types of wastes found include radionuclides, solvents, gasoline, organics, metals, high-explosive residues, and uranium tailings. These wastes are primarily present in soils, groundwater, surface waters, buildings, structures, and equipment. In many cases, hazardous and radioactive contaminants are found together as "mixed" wastes.

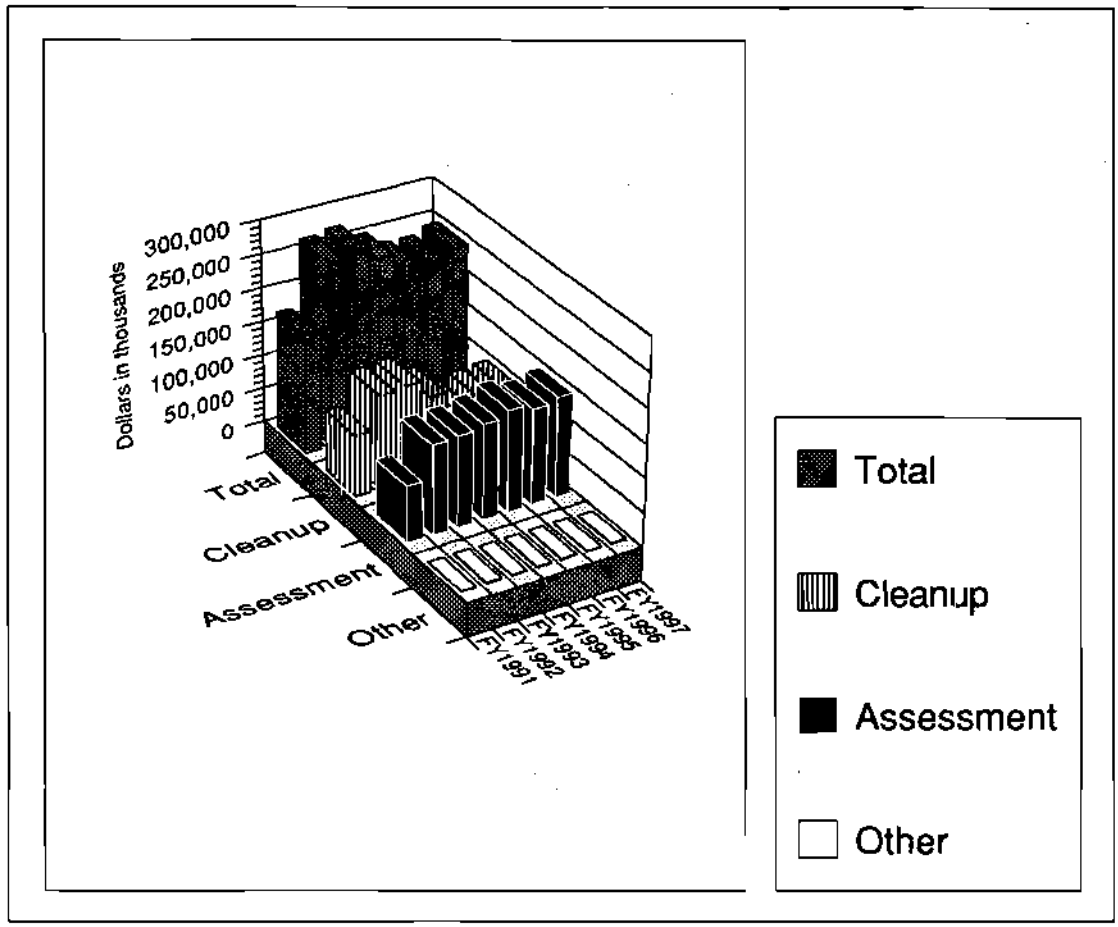
Active surveillance and maintenance programs help ensure that many contaminated sites and facilities do not become significant, immediate health risks to employees or to the public. On the other hand, a number of sites containing unstabilized mill tailings constitute a recognized source of environmental harm and risk to human health and safety, primarily as a result of radon gas emissions. Groundwater at certain sites has been contaminated by radiological and nonradiological hazardous constituents that have been carried into the soil by percolating rainwater. This contamination constitutes a potential source of exposure to possibly toxic and cancer-causing agents.

Between FY 1992 and FY 1997, the AL Environmental Restoration Remedial Action Program will complete the CERCLA Remedial Investigation/Feasibility Study and/or the RCRA Facility Investigation/ Corrective Measures Study activities for the higher-priority sites. All of the installations will have signed RCRA or CERCLA multiparty agreements for remediation or will be regulated under the corrective action provisions of the RCRA Part B Permit. All installations will have implemented cleanup, including RCRA closures or CERCLA remedial actions at sites that require more immediate attention.

Key UMTRA activities planned for FY 1992 through FY 1997 include completion of 10 sites by the end of FY 1992, 2 more by the end of FY 1993, 2 more by the end of FY 1994, 2 more before the end of FY 1995, and the remaining 8 sites after FY 1997. Before the end of FY 1994, DOE plans to request an extension of legislative authority to complete remediation. Certification and licensing of the last eight sites will extend into FY 2003.

Figure 2.3.3.2 provides anticipated funding needs.

Further information on the AL installations is provided in Section 3.



	FY1991	FY1992	FY1993	FY1994	FY1995	FY1996	FY1997
Assessment	82,813	131,955	134,153	140,049	149,748	141,292	147,928
Cleanup	90,198	138,311	141,772	116,594	85,793	92,935	96,325
Other	0	1,139	1,127	1,092	1,041	1,004	967
Total	173,011	271,405	277,052	257,735	236,582	235,231	245,220

(Dollars in thousands)

Other refers to compliance oversight.

Figure 2.3.3.2. Albuquerque Field Office environmental restoration funding (Validated Target Level).

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2.3.3.3 CHICAGO FIELD OFFICE OVERVIEW

The Chicago Field Office (CH) maintains a strong program of environmental compliance with current and anticipated regulations.

The primary mission of the facilities under CH is research and development. The environmental restoration activities reflect the nature of this work. The CH facilities are aging, and many installations have former waste disposal sites that need to be assessed to determine the extent, if any, of environmental contamination.

Nine facilities report to CH. The Argonne National Laboratory-East (ANL-E) occupies a 1,700-acre tract located 22 miles southwest of downtown Chicago. The Argonne National Laboratory-West (ANL-W) is located in the southeastern portion of the Idaho National Engineering Laboratory, near Idaho Falls, Idaho. The Brookhaven National Laboratory (BNL) is located in central Suffolk County of Long Island, New York. BNL is located over an EPA-designated, sole-source drinking water aquifer and was put on the National Priorities List in December of 1989. Battelle Columbus Laboratories (BCL) is located in Columbus, Ohio. The Piqua Nuclear Power Facility in Piqua, Ohio, and Hallam Nuclear Power Facility near Hallam, Nebraska, are decommissioned demonstration power reactors. Ames Laboratory is located in Ames, Iowa. The Fermi National Accelerator Laboratory is located about 25 miles west of Chicago. Site A, located 20 miles southwest of Chicago, is a decommissioned former Atomic Energy Commission nuclear research laboratory. The New Brunswick Laboratory, located in New Jersey, has been transferred to the Formerly Utilized Sites Remedial Action Program at DOE Oak Ridge Field Office. Chicago is responsible for the management of the D&D of the Separations Process Research Unit (SPRU), located at the Knolls Atomic Power Laboratory near Schenectady, NY.

Environmental restoration activities at the nine sites can be grouped into three areas: (1) assessment of sites to determine the extent and nature of contamination, (2) remediation of sites based on the assessments to ensure that sites are effectively cleaned up, and (3) proper surveillance, maintenance, and ultimate decontamination and decommissioning (D&D) of nuclear facilities that have exceeded their useful operational lives.

Of special concern in the area of remediation are activities needed to prevent or remedy groundwater contamination. There are many other remedial actions involving inactive storage and disposal sites for which the laboratories reporting to CH are responsible, including:

- remediation of underground storage tanks (USTs) to comply with the RCRA UST regulations promulgated by EPA;

- removal of waste from former landfills or storage/disposal sites and transfer of these wastes to facilities and sites that meet current environmental regulations and standards; and
- cleanup of minor spills of oils, solvents, and other chemicals, including polychlorinated biphenyl (PCB) leaks from transformers.

Potential health risks associated with these activities include possible exposure to organic and inorganic chemicals, radiation, and other contaminants that could have migrated into surface waters and groundwaters near the installations. These potential risks are being addressed by assessment and remediation work being completed under RCRA, CERCLA, the Clean Water Act, and appropriate State and local regulations, including enforceable agreements with EPA and the States.

BNL completed the negotiations for a Federal Facility Agreement with the State of New York and EPA, which should be signed in FY 1991. At ANL-W, an Interagency Agreement between the State of Idaho, EPA, and DOE should be completed this year.

All laboratory operators are required to have an effective D&D program that promotes cost-effective surveillance, maintenance, and D&D of DOE facilities. These activities include the shutdown of nuclear reactors, hot cells, cyclotrons, laboratories, and support facilities.

Several key accomplishments have occurred in the past year at laboratories reporting to CH:

- At BNL, more than 51 new monitoring wells have been installed and sampled since 1988. At ANL-E, a sitewide RCRA Part B Permit application has been sent to the Illinois EPA.
- At BCL, D&D continues at the King Street and West Jefferson Street sites.
- At ANL-E, D&D of the Experimental Boiling Water Reactor (EBWR) and CP-5 Reactor is under way.

In FY 1992 it is expected that the following activities will be completed:

- At ANL-E, the EBWR reactor vessel will be removed.
- At BCL, D&D of Building 6 at the King Street Site will be completed.

In FY 1993 it is expected that the following activities will be completed:

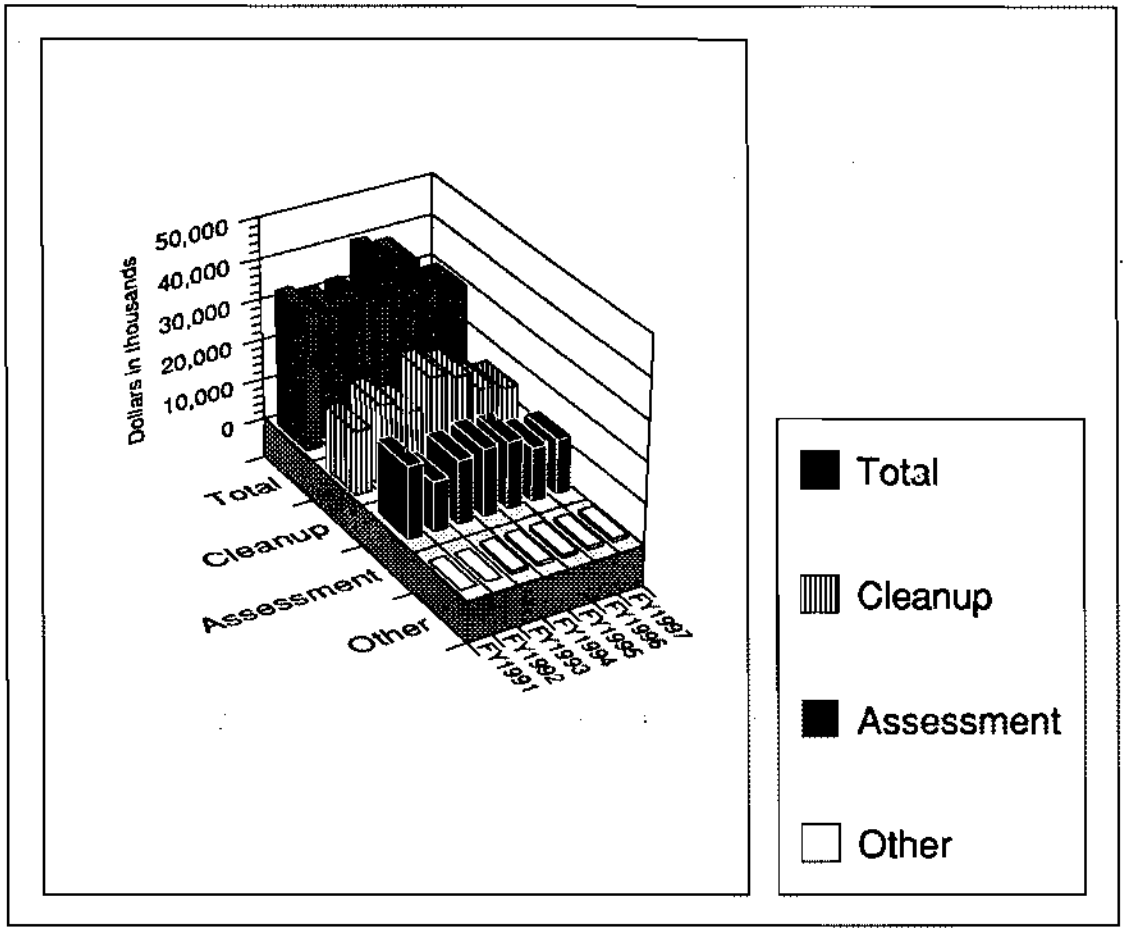
- At ANL-W, complete cleanup of PCB-contaminated soils will be completed.
- At Ames, characterization of the Chemical Disposal Site will be completed.

By the end of FY 1995, BCL D&D will have several major portions completed, but activities are expected to continue for several years beyond 1995.

Initial investigation of the D&D requirements for SPRU will start in FY 1993.

Figure 2.3.3.3 shows anticipated funding needs.

Additional information on CH installations is presented in Section 3.



	FY1991	FY1992	FY1993	FY1994	FY1995	FY1996	FY1997
Assessment	18,138	12,502	15,904	16,877	16,780	13,558	13,746
Cleanup	15,594	19,954	16,582	23,503	21,888	17,258	15,532
Other	60	0	770	811	811	811	812
Total	33,792	32,456	33,256	41,191	39,479	31,627	30,090

(Dollars in thousands)

Other refers to compliance oversight.

Figure 2.3.3.3. Chicago Field Office environmental restoration funding (Validated Target Level).

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2.3.3.4 FERNALD SITE OFFICE OVERVIEW

DOE established an Environmental Restoration Program at the Feed Materials Production Center (FMPC) in 1986 that is being implemented consistent with a Federal Facility Compliance Agreement (FFCA) (July 18, 1986) and a CERCLA 120 and 106(a) Consent Agreement (April 9, 1990).

The goal of the Environmental Restoration activities at FMPC is to protect the workers, the public, and the environment by cleaning up the inactive waste sites and surplus facilities contaminated with radioactive, hazardous, or mixed wastes.

FMPC is located in southwestern Ohio, approximately 20 miles northwest of Cincinnati near Fernald, Ohio. The FMPC production area covers approximately 136 acres in the center of the 1,050-acre site. FMPC began operations in 1953 and has historically produced high-purity uranium metal products for DOE sites.

As a result of the declining demand for product material and an increasing emphasis on compliance with environmental regulations, on October 1, 1990, responsibility for FMPC was transferred from the Office of Defense Programs (DP) to EM. DP has since successfully secured a commercial source of the product material. Therefore, on February 19, 1991, DOE submitted a Closure Report and Training and Job Placement Services Plan to Congress, as required before the formal closure of a DOE facility. The mission of the site is now solely one of cleanup and waste management.

Operation at the Reactive Metals, Inc. (RMI), Extrusion Plant, a private company located in Ashtabula, Ohio, which provided extrusion services for FMPC, ceased in October 1990.

EPA and DOE entered into an FFCA on July 18, 1986, in regard to operations at FMPC. The FFCA provides for the continuation of programs aimed at ensuring FMPC compliance with the Clean Water Act, the Clean Air Act, RCRA, and CERCLA. FMPC was added to the National Priorities List in late 1989, making it a Superfund Site as defined under CERCLA. In April 1990, DOE and EPA signed a CERCLA 120 and 106(a) Consent Agreement, which amended the FFCA to establish separate recommended alternatives and schedules for various cleanup areas at the FMPC. These cleanup areas are called Operable Units (OUs) and are defined as areas of the site having similar characteristics for which similar remedial actions will be required. At FMPC, five OUs have been identified including the Waste Pit Area, Other Waste Units, Production Area, Silos, and Environmental Media. A separate Remedial Investigation/Feasibility Study is currently being conducted for each of the OUs, with a definitive schedule leading to draft Records of Decision (RODs). All RODs are currently scheduled for completion in FY 1992. However, due to additional work

required in the remedial investigation phase, DOE and EPA are negotiating revisions to those schedules.

Before final remediation of the five OUs, interim response actions, called removal actions, are being implemented. These removal actions have been identified to address specific environmental problems that have the potential for imminent risk to the environment or the public. Four removal actions are identified in the CERCLA 120 and 106(a) Consent Agreement: the K-65 Silos removal action, the Waste Pit Area Stormwater Runoff Control removal action, the South Plume Groundwater removal action, and the Perched Groundwater under FMPC Facilities removal action. The K-65 Silos removal action, which will reduce the radon emissions from the two K-65 Silos, is scheduled for completion in December 1991. The Waste Pit Area Stormwater Runoff Control removal action will prevent contaminated stormwater from entering Paddys Run, a tributary of the Great Miami River. This removal action is also scheduled for completion in December 1991. Part 1 of the South Plume Groundwater removal action, providing an alternate water supply to offsite industrial landowners whose water is shown to contain elevated uranium concentrations, is scheduled for completion in August 1991. The pumping of pockets of contaminated groundwater (i.e., perched groundwater) under FMPC facilities will be initiated in September 1991. Additional removal actions not included in the CERCLA 120 and 106(a) Consent Agreement have been completed while others are being considered.

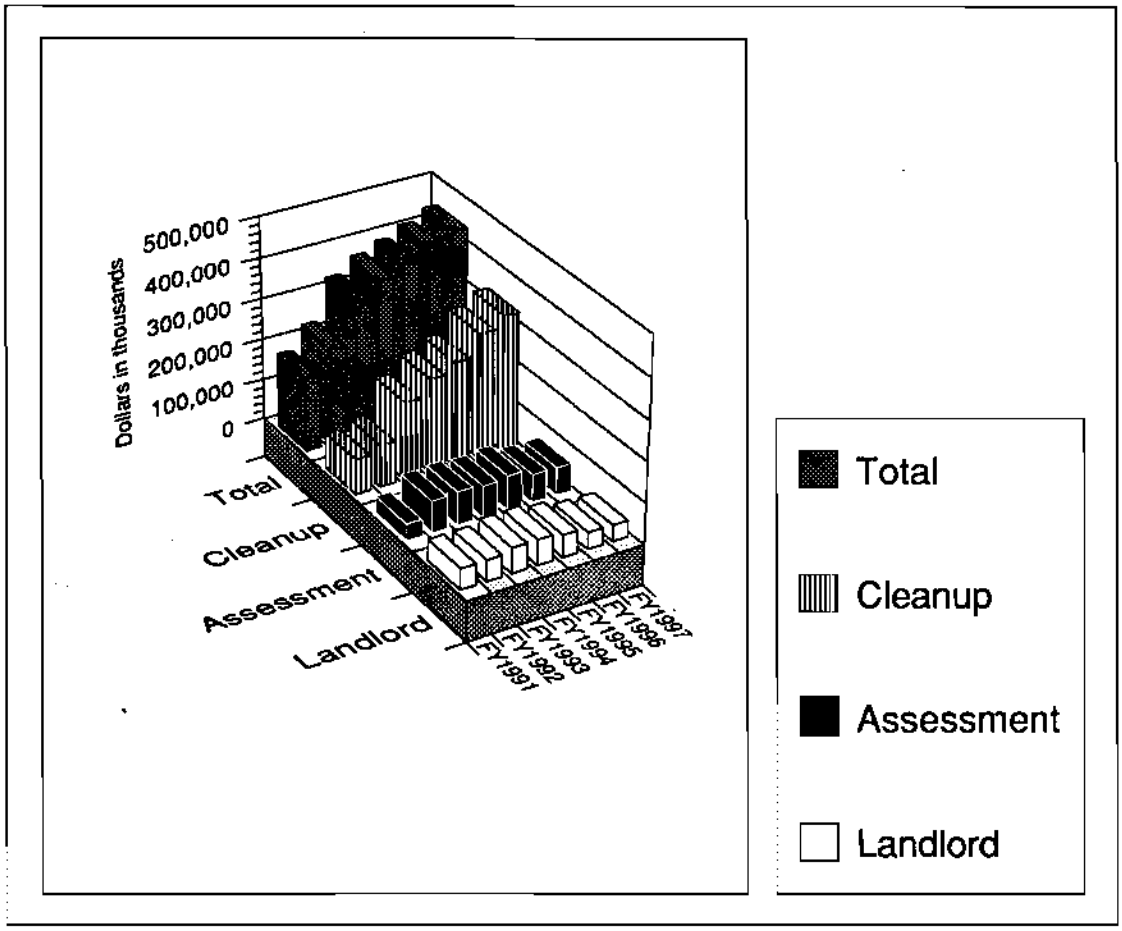
Waste operations at the site continue, including waste processing and offsite waste shipment. It is anticipated that with the startup of the Rotary Kiln in late FY 1991, all low-level waste currently stored onsite will be processed and shipped offsite by FY 1996.

In March 1990, Ohio filed contempt of court charges against DOE and the Westinghouse Materials Company of Ohio alleging violations of certain RCRA requirements. An Amended Consent Decree has been negotiated and is currently awaiting approval to establish a workable schedule for achieving compliance with RCRA, including the characterization and storage of mixed hazardous waste from past FMPC operations. FMPC is proceeding with all activities required by this proposed Consent Decree.

Although much is known about the past activities and contamination at the site, significant uncertainties remain, as FMPC is in the preliminary phase of the remedial process. Until the total extent of the contamination is known, the planning, schedules, and costs associated with the cleanup of FMPC will be subject to this inherent uncertainty.

Final remedial actions currently are scheduled to be initiated in FY 1993 for all five OUs at FMPC. However, negotiations are under way between DOE, EPA, and the State of Ohio to develop new schedules for the final remedial actions because of increased scope of work at the site. Final remediation of the RMI facility, including the Fields Brook Superfund Site, will be initiated in late FY 1994. Figure 2.3.3.4 shows the anticipated funding needs.

Additional information on the cleanup of FMPC and RMI is presented in Section 3.



	FY1991	FY1992	FY1993	FY1994	FY1995	FY1996	FY1997
Assessment	41,217	77,831	81,669	77,243	84,063	68,799	68,166
Cleanup	87,868	105,043	191,747	231,351	255,080	306,776	333,275
Landlord	50,901	52,017	61,475	62,556	53,608	41,181	40,195
Total	179,986	234,891	334,891	371,150	392,751	416,756	441,636

(Dollars in thousands)

Figure 2.3.3.4. Fernald Site Office environmental restoration funding (Validated Target Level).

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2.3.3.5 IDAHO FIELD OFFICE OVERVIEW

Remedial actions conducted at the two primary program areas of the Idaho Field Office (ID) are performed in accordance with compliance agreements with the responsible Federal and State regulatory agencies.

ID is performing environmental restoration (ER) activities at the Idaho National Engineering Laboratory (INEL) and the Grand Junction Projects Office (GJPO). The goal of these activities is to protect the workers, the public, and the environment by conducting remedial activities at inactive waste sites contaminated with hazardous, radioactive, or mixed wastes. Decontamination and Decommissioning (D&D) of inactive facilities is an integral part of the ER Program. Surveillance and maintenance of these D&D sites will minimize any potential health and safety risks to site workers and to the public.

To date, remedial actions at INEL have been conducted under a Consent Order and Compliance Agreement (COCA) between EPA Region X and ID. The U.S. Geological Survey is a signatory to the COCA in an advisory capacity. INEL was placed on the EPA Superfund National Priorities List (NPL) in December 1989. Subsequently, the Department has negotiated an Interagency Agreement (IAG) with EPA Region X, and the State of Idaho Department of Health and Welfare. That agreement is expected to be finalized and signed in FY 1991. The regulatory drivers of the IAG include RCRA, CERCLA, and other applicable State and Federal regulations. The IAG integrates RCRA and CERCLA and is intended to supersede the COCA when it is signed.

Three release sites were responsible for placing INEL on the NPL. First, carbon tetrachloride was detected in groundwater at the Radioactive Waste Management Complex at concentrations slightly above drinking water standards. Second, chromium was found to exceed regulatory limits in groundwater beneath the Test Reactor Area. Third, traces of volatile organics were detected in local drinking water at Test Area North. The use of one supply well was discontinued in 1989 to mitigate the immediate hazard, and cleanup of the groundwater is ongoing. About 350 other waste management units are being investigated as potential release sites (operable units). These operable units have been organized into ten Waste Area Groups (WAGs) for management of remedial activities. Other potential contaminants include petroleum products, acids, bases, heavy metals, polychlorinated biphenyls, and asbestos.

ID has prepared all submittals in accordance with the COCA. Nine closure plans and 28 summary assessments have been submitted for operable units, in addition to the 30 closure plans and 30 summary assessments reported in the FY 1992 - 1996 Five-Year Plan. Characterizations have been completed or are under way at several other operable units. By FY 1992, major ER assessments will be under way and remedial actions begun at several of the INEL WAGs.

Under the terms of the proposed IAG, all Remedial Investigation/Feasibility Study (RI/FS) activities would be completed by 2001.

D&D efforts are scheduled to begin at 14 facilities at INEL during the next 5 years. Eight of these projects have been started and are currently in the assessment or decommissioning phase. These projects include the disposal of radioactive sodium-potassium at the Army Reentry Vehicle Facility Site, cleanup and demolition of the Boiling Reactor Experiment-V turbine and reactor buildings, and assessment and cleanup of several surplus facilities at the Idaho Chemical Processing Plant. The remaining projects for the planning period include the cleanup of two major reactor complexes, the Engineering Test Reactor and the Materials Test Reactor. Cleanup of these sites will involve decommissioning numerous contaminated buildings and structures and will extend beyond FY 1997.

Programs being managed by the GJPO include the GJPO Remedial Action Project, the Grand Junction Vicinity Properties Project (GJVPP), Monticello Remedial Action Project, the Monticello Vicinity Properties Project, and postclosure long-term surveillance and monitoring of DOE disposal sites.

These programs are concerned with mitigating potential long-term health hazards associated with radioactive contaminants in soils and groundwater. Such conditions are the result of previous disposal practices and use of uranium mill tailings (e.g., for construction and landscaping) before the adverse health effects of radon gas and gamma radiation were recognized. Groundwater contamination from mill tailings has also occurred at both GJPO and Monticello.

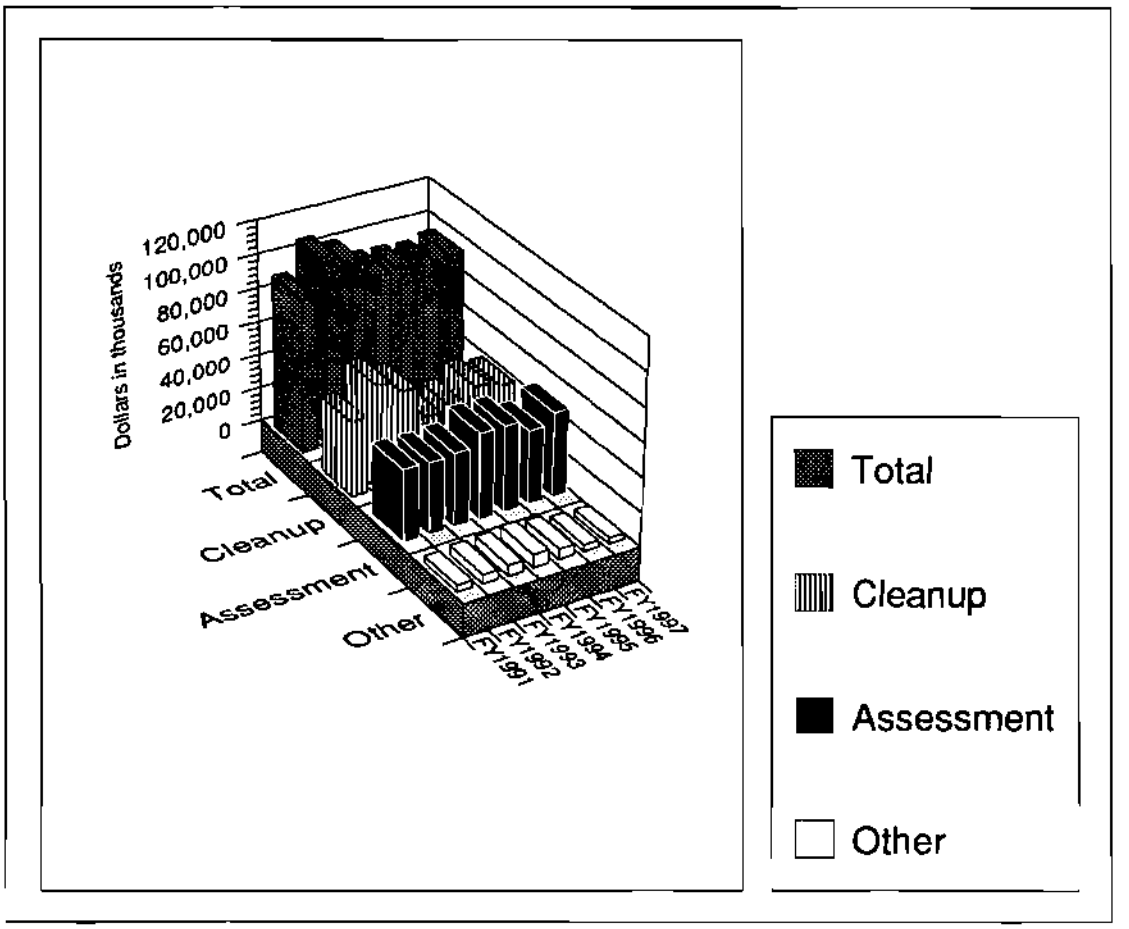
GJVPP is part of the Uranium Mill Tailings Remedial Action project. To date 3,889 properties have been included in the GJVPP, of which over 3,278 have been remediated. Tailings removal will be completed in FY 1993, with closeout anticipated in FY 1994.

Monticello Millsite and Vicinity Properties have an IAG in place with EPA Region VIII and the State of Utah. Superfund Records of Decision (RODs) were issued for the Monticello Vicinity Properties in December 1989 and for the Monticello Remedial Action Project in September 1990.

The GJPO Remedial Action Project involves the removal and disposal of uranium mill tailings from project office property and the remediation of four ore processing buildings. Assessment activities at this site are complete, and a ROD for an RI/FS was issued in April 1990. Remediation has been completed for three of the ore process buildings. Tailings removal began in FY 1991 and will be completed in FY 1992.

Figure 2.3.3.5 provides anticipated funding needs for INEL and GJPO.

Additional information on INEL and GJPO is presented in Section 3.



	FY1991	FY1992	FY1993	FY1994	FY1995	FY1996	FY1997
Assessment	42,902	42,527	43,309	50,583	50,470	43,554	50,172
Cleanup	43,931	60,703	53,316	34,568	35,663	43,866	40,441
Other	3,905	5,200	6,200	7,691	6,082	3,881	3,539
Total	90,738	108,430	102,825	92,842	92,215	91,301	94,152

(Dollars in thousands)

Other refers to compliance oversight and long-term surveillance and maintenance.

Figure 2.3.3.5. Idaho Field Office environmental restoration funding (Validated Target Level).

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2.3.3.6 NEVADA FIELD OFFICE OVERVIEW

Because of the unique types of activities conducted at the Nevada Test Site (NTS), the nature of environmental restoration (ER) activities may vary significantly from that at other DOE facilities.

The DOE Nevada Field Office (NV) operates the NTS (including historical test areas on the Tonopah Test Range and Nellis Air Force Range Area 13) and eight offsite areas. Each of these sites was used primarily for the testing of nuclear explosive devices; since 1973, all testing has been limited to NTS, which has been used for almost 700 nuclear tests consisting of both aboveground (until 1963) and underground tests. Each test, by the nature of the nuclear explosions (either fission or fusion), produces a large amount of radioactivity. In addition, the operation and decontamination of equipment and test facilities at NTS generate hazardous, radioactive, and mixed wastes. A total of 777 individual release sites will be addressed as part of the NV ER Program. The contaminants of concern include radionuclide species, metals, and, in the case of ancillary support facilities, organic compounds, metals, and petroleum.

The eight offsite test areas include the Central NTS and Shoal Test Area, Nevada; Amchitka Island, Alaska; the Rio Blanco and Rulison gas stimulation test sites, Colorado; the Gasbuggy gas stimulation and Gnome-Coach test sites, New Mexico; and the Tatum Dome test site, Mississippi. In addition to localized subsurface contamination with radionuclides, some of the sites have surficial contamination with hazardous and mixed wastes related to drilling mud disposal pits.

Potential pathways for the migration of contamination at NTS are through resuspension of surface materials, disturbance of contaminated soils, and the flow of contaminated groundwater. No offsite risks to public health or the environment are believed to be present as a result of the activities being conducted at NTS. The remoteness of the site and the rigidly controlled access prevent inadvertent public exposure. NV has taken special precautions to reduce risks to worker populations. The potential for offsite migration of contamination, although considered negligible, will be thoroughly evaluated as part of the ER Program.

The principal regulatory drivers for the NV ER Program are the provisions and implementing requirements of CERCLA, RCRA, the Safe Drinking Water Act, and State environmental laws and regulations governing each site. The regulatory authorities include EPA regional offices for each site and the corresponding State environmental divisions or departments.

To achieve compliance with environmental regulations, NV has instituted an ER Program with early emphasis placed on

determining the significance of any damage to the environment. The scope of ER activities covers (1) the development and implementation of closure plans for numerous sites where hazardous and/or mixed wastes were disposed of, (2) the installation of groundwater characterization and monitoring wells, (3) the conduct of remedial investigations and feasibility studies of waste area groups, (4) the cleanup of large surface areas contaminated with radioactive materials, (5) the remediation of industrial sites as required, and (6) the evaluation and restoration of offsite locations. Eight facilities at NTS are scheduled for decontamination and decommissioning.

Most planned ER activities have an established technical basis. The cleanup of large surface areas (3,000 acres) contaminated with radioactivity, however, requires that new technologies be developed. Another area of concern is constraints on the characterization of the subsurface conditions resulting from each underground test. No protocols are established for determining the data required or the techniques necessary to safely acquire these data. Special provisions may be necessary to characterize these areas to ensure that the ER Program implemented resolves, rather than results in, releases to the environment. In FY 1992, NV will be continuing remedial investigations at the following locations:

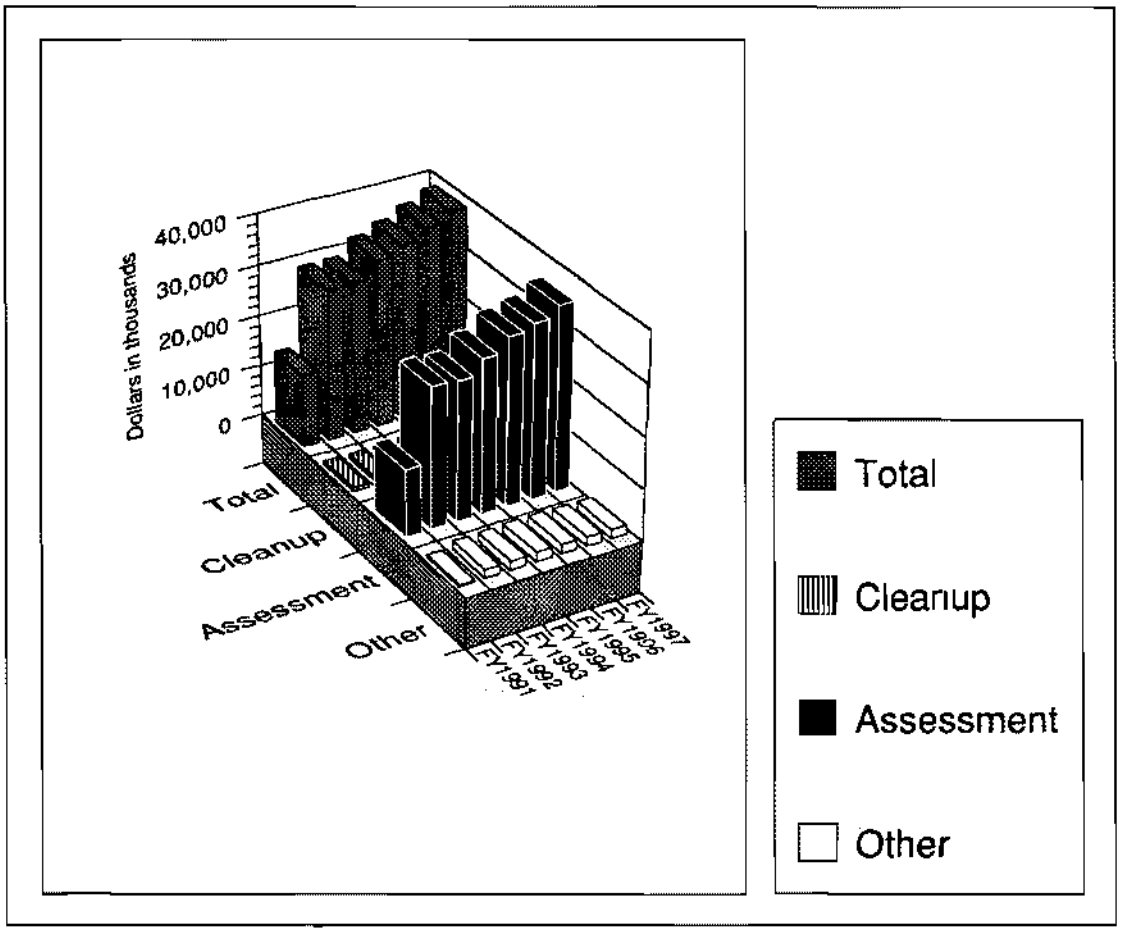
- Yucca Flat underground testing area;
- The areas at NTS, Tonopah Test Range;
- Nellis Air Force Range Area 13 where surface soils were contaminated as a result of safety experiments; and
- The sumps and injection wells that historically were used for the disposal of wastes.

Remedial investigations will be initiated at contaminated waste sites during FY 1992. Implementation of closure plans for some of the RCRA sites has been accelerated.

By the end of FY 1997, an aggressive ER Program planned by NV will have addressed all of the areas of major concern at NTS and offsite locations. Remedial investigations and feasibility studies and/or RCRA closure plans will be completed for all of the waste area groups. Actual remediation will have begun for the contaminated soils at NTS, Tonapah Test Range, and Nellis Air Force Range Area 13 as well as for the inactive storage tanks, leach fields, sumps, and injection wells. RCRA closures will also be initiated for the active tunnel ponds and muck piles in addition to past disposal areas. The monitoring programs for the underground testing areas will also be under way.

Figure 2.3.3.6 provides anticipated funding needs.

Additional information on NTS and offsite test locations is presented in Section 3.



	FY1991	FY1992	FY1993	FY1994	FY1995	FY1996	FY1997
Assessment	13,058	27,270	27,167	29,947	32,774	33,912	35,989
Cleanup	725	730	833	1,026	0	867	867
Other	334	1,610	1,728	1,863	1,860	1,865	1,756
Total	14,117	29,610	29,728	32,836	34,634	36,644	38,612

(Dollars in thousands)

Other refers to compliance oversight.

Figure 2.3.3.6. Nevada Field Office environmental restoration funding (Validated Target Level).

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2.3.3.7 OAK RIDGE FIELD OFFICE OVERVIEW

The goal of the field environmental restoration (ER) activities managed by the Oak Ridge Field Office (OR) is to eliminate or reduce to prescribed safe levels the risks to the environment or to human health and safety posed by inactive and surplus sites and facilities that have been contaminated with radioactive, hazardous, or mixed wastes. Most ER activities are driven by compliance agreements and orders between DOE, EPA, and State agencies that also provide for aggressive cleanup schedules.

Remedial actions and decontamination and decommissioning (D&D) are conducted at six DOE-owned installations located in four states. These installations include:

- Oak Ridge K-25 Site (K-25 Site), the Oak Ridge Y-12 Plant (Y-12 Plant), and the Oak Ridge National Laboratory (ORNL) in Tennessee;
- Paducah Gaseous Diffusion Plant (Paducah) in Kentucky;
- Portsmouth Gaseous Diffusion Plant (Portsmouth) in Ohio; and
- Weldon Spring Site in Missouri.

All of these installations except Paducah and Portsmouth are on EPA's National Priorities List (NPL).

In addition, OR is responsible for management of field activities conducted under the Formerly Utilized Sites Remedial Action Program (FUSRAP). The program currently includes 33 sites in 13 states designated for cleanup under the authority of the Atomic Energy Act of 1954, as amended, and congressional legislation enacted in 1984 and 1985. Six of these sites are on the NPL.

Section 3 provides information about each of the OR installations and FUSRAP. An overview of them is provided below.

Installations on the Oak Ridge Reservation: The K-25 Site (formerly the Oak Ridge Gaseous Diffusion Plant), the Y-12 Plant, and ORNL installations are located within the Oak Ridge Reservation, northwest of Knoxville, Tennessee. All three installations have a large number of inactive sites and facilities and a correspondingly large volume of waste. A CERCLA/RCRA Federal Facilities Agreement (FFA) including the entire reservation is currently in final stages of negotiation. The FFA will be signed by DOE, EPA, and the Tennessee Department of Conservation and will establish requirements for remedial action activities at the K-25 Site, the Y-12 Plant, and ORNL. While most current remedial actions are assessments that precede actual cleanups, interim corrective measures consisting of contaminant source identification and removal are also under way.

The K-25 Site has major remedial actions and D&D activities planned and ongoing.

The site includes burial grounds, inactive processing facilities, waste storage facilities, underground tanks, surface impoundments, and waste treatment facilities that require cleanup. Initial assessment activities have been completed on the 140 currently identified RCRA Solid Waste Management Units (SWMUs) at the site, and more detailed investigations of the high priority units are taking place. The major D&D activity for OR is the decommissioning of the former Oak Ridge Gaseous Diffusion Plant at the K-25 Site. Surveillance and maintenance of the facility is ongoing, and planning for D&D is under way. A Federal Facility Compliance Agreement is currently being negotiated with the EPA to address polychlorinated biphenyl (PCB) contamination at the K-25 Site and steps toward compliance with the Toxic Substances Control Act.

The Y-12 Plant is contaminated with hazardous materials, low-level radioactive material (primarily uranium), and mixed waste resulting primarily from past weapons production processes. Cleanup is addressing old disposal sites, waste storage tanks, spill sites, and contaminated inactive facilities. In addition, significant amounts of mercury are present onsite and offsite in the East Fork Poplar Creek that runs through the Y-12 Plant and the city of Oak Ridge. Closure (final remediation) has been completed for 12 SWMUs.

ORNL includes more than 200 sites that are contaminated with hazardous waste, liquid and solid low-level and transuranic radioactive waste, mixed waste, and a variety of radioactively contaminated surplus facilities. The sites have been grouped in 13 Waste Area groups for purposes of proceeding with assessment and cleanup. Investigations are currently under way and planned, but a number of interim corrective measures have and will be implemented to address the highest priority concerns.

Offsite contamination is also being investigated as part of the Oak Ridge Reservation ER Program. Offsite efforts include East Fork Poplar Creek, the Oak Ridge Sewer Line Beltway, the CSX Railroad Spur, the Clinch River, and the lower Watts Bar Reservoir.

Paducah and Portsmouth Gaseous Diffusion Plants: Paducah is an operating plant used for the production of enriched uranium. It is located in northwestern Kentucky, near the Ohio River. Paducah has onsite and offsite contamination, primarily uranium, arsenic, PCBs, technetium, and trichloroethylene. Investigations are under way by DOE under an Administrative Consent Order with the EPA under CERCLA. Current activities are focused on the investigation of groundwater and surface water, soil, and sediment contamination.

Portsmouth is also an operating uranium enrichment plant located in south central Ohio. Contamination is present, but it is contained onsite. DOE signed an Administrative Consent Order with EPA and a separate Consent Decree with the State of Ohio in 1989 that identify requirements for remedial actions at the site under RCRA. Interim corrective measures are under way at the site.

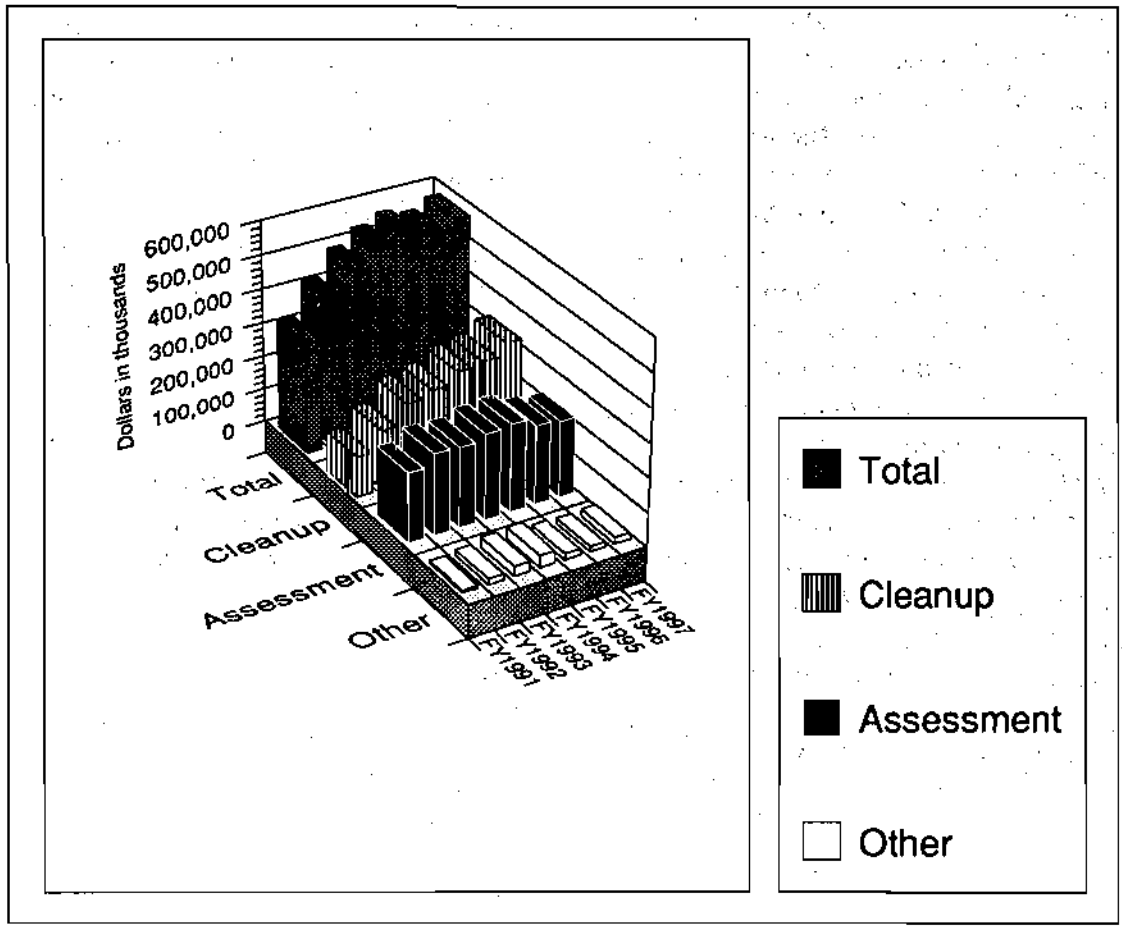
Weldon Spring Site: Unlike the other OR installations, the Weldon Spring Site has been shutdown for many years. The site, located about 30 miles west of St. Louis, Missouri, was used by the Army as an

ordnance works in the 1940s and 1950s and by the Atomic Energy Commission to process uranium and thorium in the 1950s and 1960s. DOE's efforts at the site are devoted to ER activities under a single project (Weldon Spring Site Remedial Action Project) with partial funding provided by the Army. DOE is currently negotiating a Federal Facilities Agreement (FFA) with EPA that represents an update of an FFA signed in 1986. Cleanup of the site will include (1) a 9-acre quarry containing radiologically contaminated soils, rubble, and water; (2) four waste ponds containing radioactive sludges and water; and (3) a number of buildings and other structures and a large volume of contaminated soil and building material. Groundwater is also contaminated onsite and offsite. Of particular concern, radiological and chemical contamination has migrated beyond the quarry site boundary and is within 0.5 mile of the county well field.

FUSRAP: Remedial actions conducted under FUSRAP are currently under way at sites in Massachusetts, Missouri, New York, New Jersey, Oregon, and Tennessee. The FFA between DOE and EPA Region VII for all FUSRAP sites in the State of Missouri is in place. The FFAs between DOE and EPA Region II for two FUSRAP sites on the NPL in New Jersey have been finalized. Implementation schedules are under development. The principal contaminants at the sites are low concentrations of uranium, radium, and thorium.

Outyear efforts include the completion of vicinity properties remediation and completion of the chemical plant remediation during FY 1996.

Figure 2.3.3.7 provides anticipated funding needs.



	FY1991	FY1992	FY1993	FY1994	FY1995	FY1996	FY1997
Assessment	204,336	237,234	235,211	252,748	260,055	235,042	225,917
Cleanup	118,108	174,244	234,549	253,519	287,038	298,186	330,947
Other	7,400	15,700	28,760	35,927	18,483	15,374	18,871
Total	329,844	427,178	498,520	542,194	565,576	548,602	575,735

(Dollars in thousands)

Other refers to compliance oversight.

Figure 2.3.3.7. Oak Ridge Field Office environmental restoration funding (Validated Target Level).

2.3.3.8 RICHLAND FIELD OFFICE OVERVIEW

The Richland Field Office (RL) is implementing an Environmental Restoration (ER) Program at the Hanford Site, Washington, based upon a prioritization consistent with the Tri-Party Agreement (TPA), and its revisions, among DOE, EPA, and the State of Washington Department of Ecology.

The goal of the ER Program at the Hanford Site is to protect the workers, public, and environment by cleaning up inactive waste sites and surplus facilities contaminated with radioactive, hazardous, or mixed wastes.

The Hanford Site, located in arid southeastern Washington State, covers 560 miles^2 and has hosted various DOE activities since 1943. About 340,000 people reside within a 50-mile radius of the center of the Site (1980 U.S. Census). Some of the Nation's earliest nuclear reactors and nuclear fuels reprocessing facilities are located at the Site, and typical missions have included plutonium production and separation, waste management, advanced reactor design and testing, basic scientific research, and renewable energy technologies development.

At the Hanford Site, the Federal government generated wastes that are regulated as both radioactive materials and hazardous chemicals. Approximately 1,100 waste sites have been identified as potentially requiring some degree of remediation. Most of these sites originated from onsite storage or soil column disposal of low-level radioactive and chemical waste, resulting primarily from the production and chemical processing of plutonium. Wastes stored in 149 underground single-shell tanks and 28 double-shell tanks contain primarily residual sludge and salt cake resulting from the transfer or evaporation of liquids generated as part of the plutonium separation processes at the Site.

The 1,100 individual waste sites, varying in size from one ft.^{2} to 1,800 acres, have been grouped into 78 operable units that have attributes amenable to combined characterization and/or remediation. These units have been further organized into four large aggregate areas based primarily on their geographic location on the Hanford Site. These four areas have been included by the EPA on the National Priorities List and consist of (1) 100 Area (reactors), (2) 200 Area (chemical reprocessing and waste management facilities), (3) 300 Area (fuel fabrication and research and development facilities), and (4) 1100 Area (vehicle maintenance facilities). Four of the 78 operable units have been designated for characterization and remediation of groundwater under the waste sites.

Currently, more than 100 surplus facilities at the Hanford Site are radioactively contaminated, including eight former production reactors, chemical process buildings, structures, and ancillary structures. The ancillary structures include exhaust stacks, reactor gas drying/ recirculation buildings, chemical storage and handling buildings, storage tanks, effluent

piping and tunnels, effluent retention structures, and river outfall structures. Characterization and assessment activities are under way to determine current and future public health risks. Surveillance and maintenance activities are also ongoing and essential to maintain confinement of contaminants and mitigate any increase in health risk.

Three major ongoing decontamination and decommissioning (D&D) projects include the D&D of the 201-C Strontium Semiworks, cleanup of the 105-F and 105-H reactor fuel basins, and resumption of D&D of the 233-S Plutonium Concentration Facility. Other major projects currently supported through the Hanford Site D&D program include the cleanup of contaminated hot cells in the 324 and 325 Buildings and the completion of the Final Environmental Impact Statement for the D&D of the 100 Area reactors. Future D&D activities are also planned for the 100 Area reactors, ancillary and effluent facilities, and the 209-E Critical Mass Laboratory.

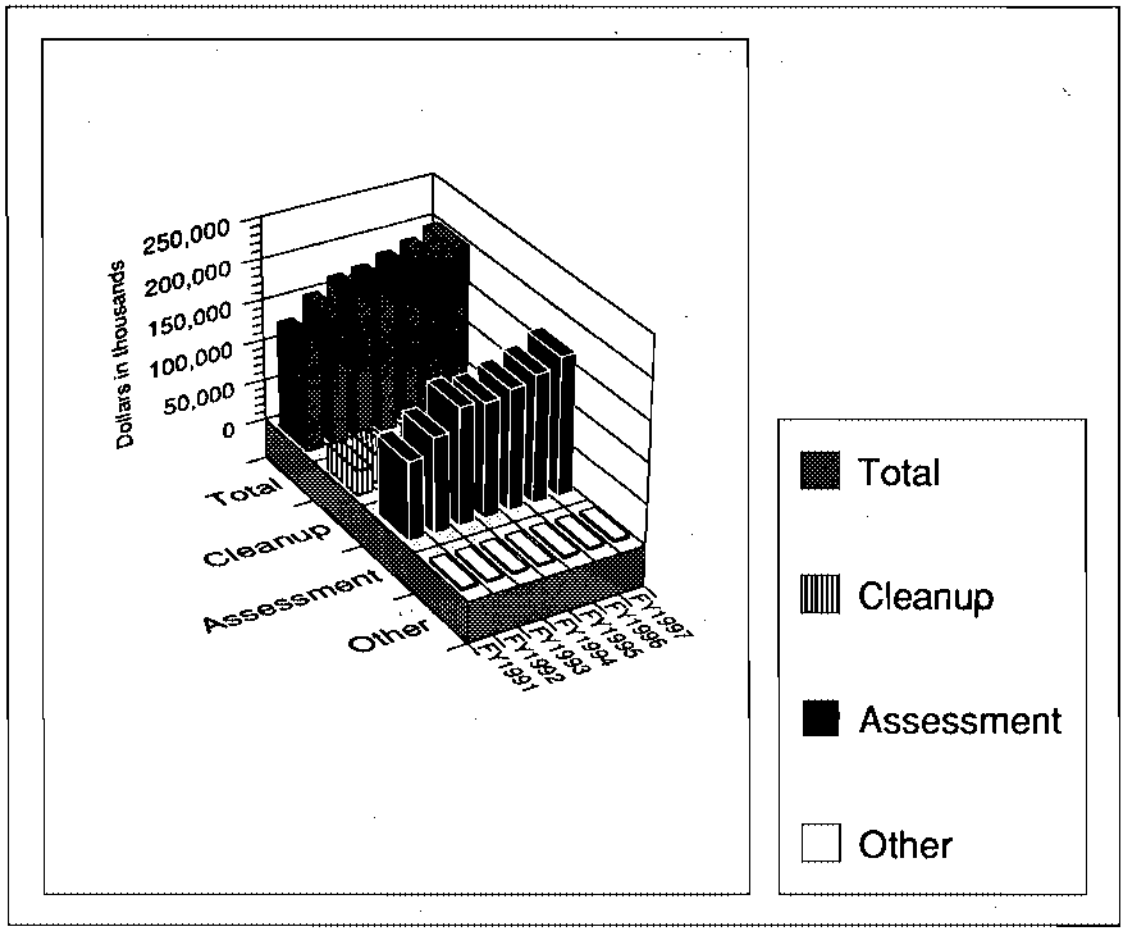
The Hanford Federal Facilities Agreement and Consent Order, referred to as the TPA, is an agreement among DOE, EPA, and the State of Washington Department of Ecology. This TPA establishes jurisdictions, authorities, and other legal responsibilities for the parties, including activity schedules and milestones. The primary objective of the TPA is to ensure that the Hanford Site is cleaned up in a timely and cost-effective manner.

Other major objectives of the TPA are (1) to achieve compliance with RCRA and CERCLA requirements, (2) to ensure adequate public involvement in decisions dealing with the cleanup, and (3) to ensure that the work is properly prioritized. As of December 1990, 75 of 79 scheduled milestones have been completed. The TPA was written as a "living" document that can be changed by the parties to incorporate lessons learned as characterization activities continue and more is learned about the site. A major revision to the TPA has been proposed by DOE with regard to management of the characterization and cleanup of the operable units. Known as the Aggregate Area Management (AAM) concept, groups of two or more operable units would be treated as a unit for purposes of characterization and cleanup, thereby attaining efficiencies in site investigations by coordinating field activities. AAM studies would evaluate existing data, identify the need for Expedited Response Actions (ERAs), identify contaminants and response scenarios, and focus new work under the work plans. The ERA concept came to fruition on October 18, 1990, when DOE, EPA, and the Washington Department of Ecology signed an Agreement in Principle identifying three potential sites for expedited cleanup action. All three identified expedited cleanup actions have been initiated. DOE believes that implementation of the AAM strategy is a major step in streamlining the remedial investigation/feasibility study process. In accordance with the TPA, work plans for 13 operable units have been submitted to the regulators, of which four have been approved. Seven additional work plans are waiting approval; two are undergoing revision. RIs are ongoing at the four operable units for which work plans have been approved.

Outyear efforts include submittal of six operable unit work plans per year until all 78 work plans have been submitted. Interim milestones for the conduct of cleanup activities will be developed as the work plans are approved.

Further information on the Richland installations is provided in Section 3.

Figure 2.3.3.8 provides anticipated available funding.



	FY1991	FY1992	FY1993	FY1994	FY1995	FY1996	FY1997
Assessment	96,976	116,441	143,676	140,187	148,245	156,830	169,904
Cleanup	30,675	35,675	23,190	30,220	30,438	29,845	27,205
Other	3,200	2,784	2,648	2,500	3,107	3,202	3,129
Total	130,851	154,900	169,514	172,907	181,790	189,877	200,238

(Dollars in thousands)

Other refers to compliance oversight.

Figure 2.3.3.8. Richland Field Office environmental restoration funding (Validated Target Level).

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2.3.3.9 ROCKY FLATS OFFICE OVERVIEW

A five-phase Environmental Restoration (ER) Program is being carried out for assessment and cleanup of Rocky Flats (RF).

Rocky Flats is a nuclear weapons manufacturing facility currently operated by EG&G - Rocky Flats under contract to DOE. RF is located in Jefferson County, Colorado, at the base of the Rocky Mountains. It covers a total of approximately 11 miles^2, of which 350 acres is used for actual operations. RF is located 16 miles northwest of downtown Denver and 12 miles from the surrounding communities of Boulder and Golden. The closest community, Arvada, recently annexed land that borders the DOE property.

RF operation involves (1) operating facilities for the recovery of plutonium; (2) managing waste treatment, storage, and shipment for final disposal; (3) operating a chemical laboratory; (4) performing research and development; and (5) providing special support operations for other DOE facilities. In performing these operations, many materials are generated that may be radioactive, mixed, or hazardous waste.

Multiple compliance agreements have been involved in the ER of RF, including:

- Compliance Agreement of July 31, 1986, among DOE, EPA, and the State of Colorado seeks to resolve issues related to and to establish requirements for hazardous waste, including radioactive mixed waste, compliance at RF, and the establishment of requirements and procedures for investigation, feasibility studies, and remedial/corrective actions consistent with RCRA and CERCLA.
- The Agreement in Principle of June 16, 1989, between DOE and the State of Colorado specifies numerous DOE actions and provides for additional technical and financial support for State activities in environmental oversight, monitoring, remediation, emergency response, and health-related initiatives associated with RF.
- The Federal Facilities Agreement and Consent Order, also known as the Interagency Agreement (IAG), signed January 22, 1991, among DOE, EPA, and the State of Colorado, seeks to integrate EPA and State requirements for environmental cleanup under RCRA and CERCLA. The IAG outlines tasks, schedules, milestones, and priorities for investigations, feasibility studies, risk assessments, and interim remedial actions for all inactive waste sites at RF. An IAG is required for all Federal facilities listed on the CERCLA National Priorities List (NPL). RF was placed on the NPL on October 4, 1989.
- In an October 3, 1990, news release, DOE made a commitment to support a surface water management plan (SWMP)

recommended by the local communities, commonly referred to as Options B+J, subject to completion of appropriate National Environmental Policy Act review. There is no formal agreement between DOE and the cities detailing the scope and specifics of the local community water projects to be funded by DOE. The surface water management Options B+J, are encompassed in the SWMP, including the construction of an engineered system, both onsite and offsite, to control and treat surface water flows and pollutants which may be transported into offsite drinking water reservoirs. Members of the Colorado Congressional Delegation and the Governor of Colorado have endorsed Options B+J.

- Option B will be the cities' responsibility, involving mainly offsite activities; namely, the purchase of alternate water rights for the city of Broomfield to replace their Great Western Reservoir rights, some supporting projects to supply and store this new water for Broomfield, and the construction of a system capable of diverting the 100-year recurrence interval runoff event from Woman Creek away from Standley Lake. Option J will be the Department's responsibility, involving a series of onsite studies and activities to evaluate the surface water flow system; improve existing monitoring, control, and treatment systems; and if feasible, achieve "zero discharge" for all or part of the plant drainage system. Funding would be provided under a grant application from the cities.

Both radioactive and nonradioactive wastes are generated at RF in the nuclear weapons production process. Current waste-handling practices involve onsite and offsite recycling of waste materials, onsite storage of hazardous and radioactive mixed wastes, and offsite disposal of solid radioactive materials at another DOE facility. Both storage and disposal of hazardous, radioactive, and mixed wastes occurred onsite in the past. Preliminary assessments under the ER Program identified some of the past onsite waste storage and disposal locations as potential sources of environmental contamination. One hundred seventy-eight sites have been identified at RF, including three offsite reservoirs and one land area located off DOE property. The offsite areas may have received contaminated effluent and sediments originating from the Plant. All 178 sites have been grouped into 16 operable units (OUs).

Of particular concern is the disposition of solidified mixed waste, referred to as pondcrete, sent to the Nevada Test Site (NTS) for storage and disposal. To date, 6,000 boxed pondcrete blocks have been shipped to NTS.

The ER Program is being implemented in five phases:

- Phase 1 (Installation Assessment) includes preliminary assessments and site inspections to assess potential environmental concerns.
- Phase 2 (Remedial Investigations) includes planning and implementation of sampling programs to delineate the magnitude and extent of contamination at specific sites and evaluating potential contaminant migration pathways.
- Phase 3 (Feasibility Studies) evaluates remedial alternatives and develops remedial action plans to mitigate environmental problems identified in Phase 2 as needing correction.
- Phase 4 (Remedial Design/Remedial Action) includes design and

implementation of site-specific remedial actions selected on the basis of Phase 3 feasibility studies.

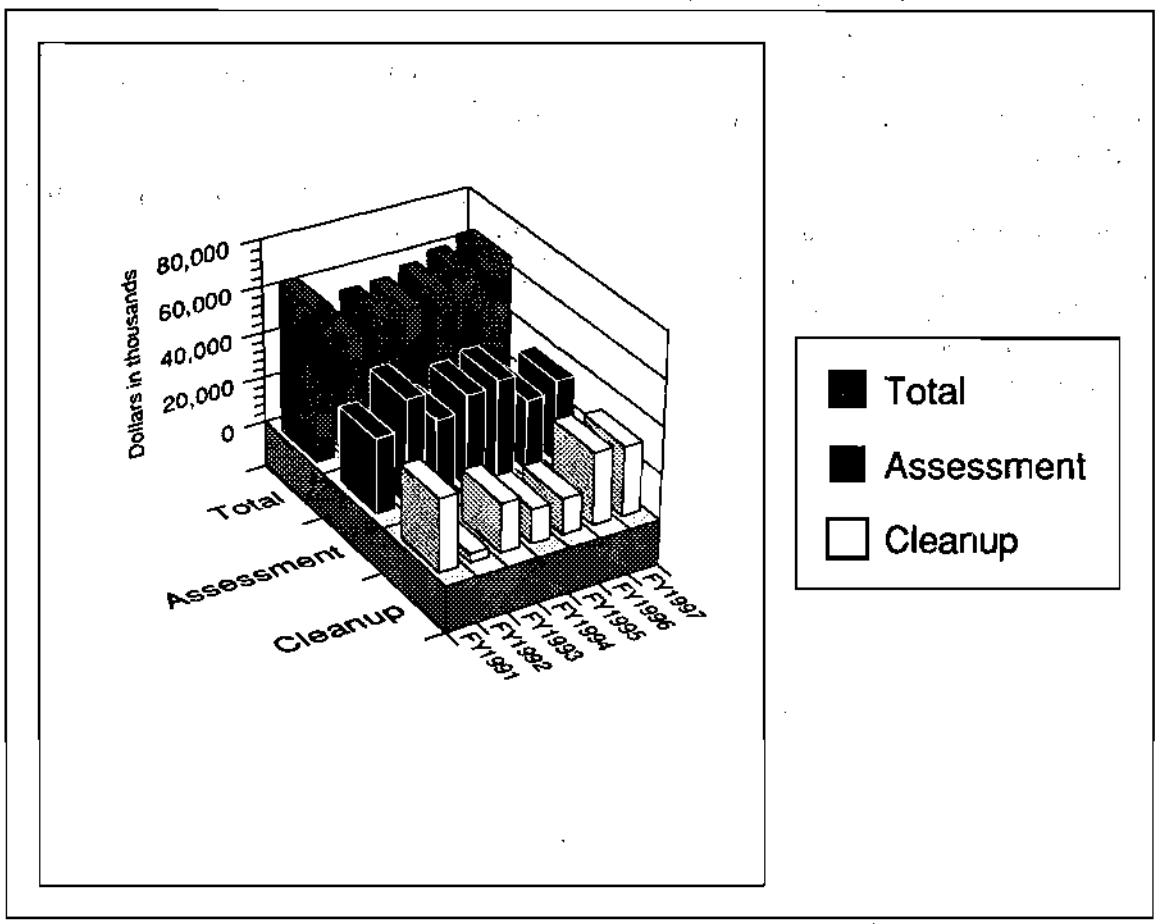
- Phase 5 (Performance Assessment and Verification) implements monitoring and performance assessments of remedial actions. It verifies and documents the adequacy of remedial actions carried out under Phase 4.

Phase 1 has already been completed at RF, and each OU is in a stage of Phases 2, 3, and 4. Within two OUs at RF, interim remedial actions are under way to limit migration of contaminants.

Out year efforts include beginning of remedial action construction for OU 6 in FY 1997 and initiating of corrective/ remedial action construction for OU 2 in FY 1997.

Figure 2.3.3.9 provides anticipated funding needs.

Additional information on RF is presented in Section 3.



	FY1991	FY1992	FY1993	FY1994	FY1995	FY1996	FY1997
Assessment	33,138	45,965	33,393	40,344	43,089	30,725	35,683
Cleanup	31,862	4,035	21,607	14,981	15,457	31,398	30,151
Total	65,000	50,000	55,000	55,325	58,546	62,123	65,834

(Dollars in thousands)

Figure 2.3.3.9. Rocky Flats Office environmental restoration funding (Validated Target Level).

2.3.3.10 SAN FRANCISCO FIELD OFFICE OVERVIEW

The Environmental Restoration (ER) Program being implemented at seven installations within the jurisdiction of the San Francisco Field Office (SAN) is consistent with the diversity of the installation's respective missions.

ER activities, involving ongoing assessment and cleanup efforts, are being carried out or planned in accordance with the 5-year planning process at all major facilities under the jurisdiction of SAN.

ER activities are associated with the management, cleanup, and disposal of the radioactive, hazardous, and mixed waste resulting from DOE's past operations at SAN facilities. Facilities include Lawrence Livermore National Laboratory (LLNL) and General Atomics San Diego facility (GA), which supported DOE's Defense Programs; the Energy Technology Engineering Center (ETEC), General Electric Valicitos facility (GE) and GA, which were involved in Nuclear Energy programs; and Lawrence Berkeley Laboratory (LBL), the Stanford Linear Accelerator Center, and the Laboratory for Energy-Related Health Research (LEHR), which conducted research activities for DOE's Office of Energy Research.

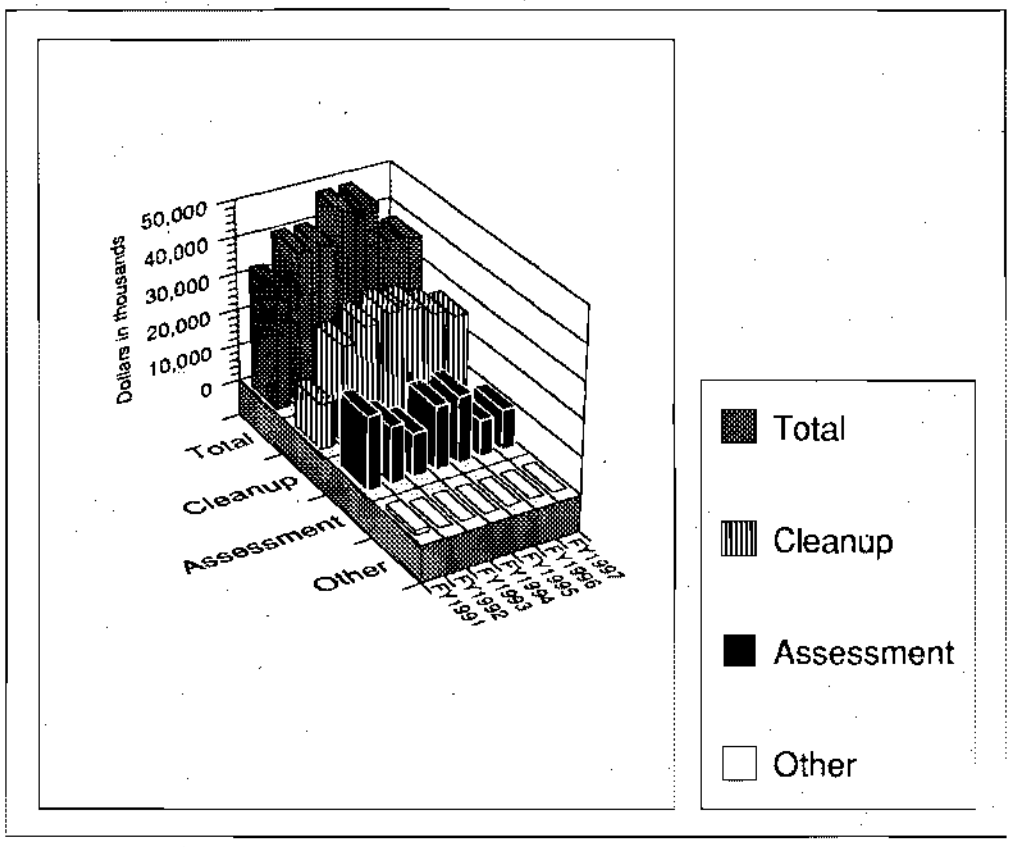
Site investigations and remedial actions are well under way at LLNL, the largest of SAN's facilities. The extent of groundwater contamination has been determined at both the Main Site and at Site 300. Remedial actions continue to be carried out at the Main Site in accordance with the Federal Facilities Agreement, signed in October 1988, between DOE, EPA, the California Water Quality Control Board, and the California Department of Health Services. The Remedial Investigation (RI)/Feasibility Study (FS) Work Plan, Quality Assurance Project Plan, and the Community Relations Plan have been approved, and an RI/FS and Proposed Remedial Action Plan have been submitted to the regulatory agencies. Pilot studies are under way for extracting and treating groundwater and extracting volatile hydrocarbons from the soil. Progress is being made toward the cleanup of groundwater at Site 300. Draft RIs have been submitted for nine locations and Draft FSs for five locations. Interim cleanup of volatile hydrocarbons has begun at the Site 300 General Services Area. DOE, EPA, and the State are currently negotiating an Interagency Agreement for implementing site assessments and remedial activities at Site 300.

SAN is making progress in ER activities, including site assessments, remedial actions, and decontamination and decommissioning (D&D) operations, at its other facilities. Site assessments and RIs are under way at ETEC, LBL, and LEHR to determine whether groundwater contamination is present and to define the nature and extent of any contamination discovered. The D&D

activities under way at ETEC and LEHR include surveillance and maintenance activities, assessments, and decontamination. Noteworthy is the D&D work at LEHR, where DOE has a Memorandum of Agreement with the University of California, Davis, to complete cleanup and return the site to the University, currently scheduled for 1995. D&D work completed at LEHR in FY 1991 included the shipment of low-level radioactively contaminated biological waste to the Hanford facility for disposal. D&D activities are also ongoing at several ETEC facilities, with a goal to remove contamination and permit unrestricted use. Plans are under way to initiate D&D activities at GA and GE.

Figure 2.3.3.10 provides anticipated funding needs for ER activities at SAN installations for FY 1993 - 1997. Outyear efforts are directed at ER construction activities and continued progress in the D&D of identified facilities is scheduled through FY 1997.

Additional information on SAN installations is presented in Section 3.



	FY1991	FY1992	FY1993	FY1994	FY1995	FY1996	FY1997
Assessment	19,965	15,339	11,584	17,118	18,193	9,833	10,849
Cleanup	12,035	26,061	29,816	31,835	31,023	28,298	26,181
Other	1,300	0	0	0	0	0	0
Total	33,300	41,400	41,400	48,953	49,216	38,131	37,030

(Dollars in thousands)

Other refers to compliance oversight.

Figure 2.3.3.10. San Francisco Field Office environmental restoration funding (Validated Target Level).

2.3.3.11 SAVANNAH RIVER FIELD OFFICE OVERVIEW

The primary objective of the Savannah River Site (SRS) Environmental Restoration (ER) Program is to identify, characterize, and remediate all inactive waste sites. The Program is designed to comply with all applicable regulations to minimize or mitigate effects on the environment.

SRS is located on 192,000 acres along the Savannah River near Aiken, South Carolina. The primary mission of SRS is to support national security as a major source of reactor-produced material. The number of ER-related issues at SRS is commensurate with the size of the installation. SRS has an active ER Program that addresses issues in the following areas:

- Identification of waste sites,
- Investigation to confirm and quantify contamination,
- Technology development and demonstration to conduct cleanup,
- Installation of postclosure environmental monitoring,
- Remedial design and cleanup to restore natural resources, and
- Decontamination and decommissioning (D&D) of surplus facilities.

In the period 1984 - 1986, $10 million was spent at SRS for the Groundwater Protection Environmental Impact Statement (EIS) to evaluate, by technical analysis and environmental risk analysis method, the magnitude and potential risk associated with most waste sites. This evaluation included radioactive, hazardous, and mixed waste sites at SRS and also included remediation needs. Those few sites not covered by this EIS will be tied to it through an Environmental Assessment.

A total of 266 waste management units are currently in the ER Program at SRS. The type of waste units identified at SRS range from nonhazardous waste units to waste units containing both hazardous and radioactive waste. The waste units have been categorized into 5 groundwater units, 3 burial grounds, 6 reactor cooling/purge basins, 12 sanitary sludge sites, 3 process sewer lines, 1 storage tank, 1 sanitary landfill, 9 erosion control sites, 27 spill sites, 15 ash piles, 58 seepage/settling basins, 17 surface water units, and 105 disposal piles/ pits. Some waste units include the contamination of surrounding subsurface soils and groundwater. The contaminants identified at various waste units include volatile organic compounds, heavy metals, pesticides, and radionuclides.

The first priority for FY 1991 at SRS is to complete RCRA closure of the four H-Area Seepage Basins by August 1991. Closure of the three F-Area Seepage Basins was completed in December 1990. The second priority is the A/M-Area groundwater remediation project. This area poses a potential threat to human health and the environment if left untreated. The other waste area groups are broken down by RCRA waste site closure, consent order on settlement of the Natural Resources Defense

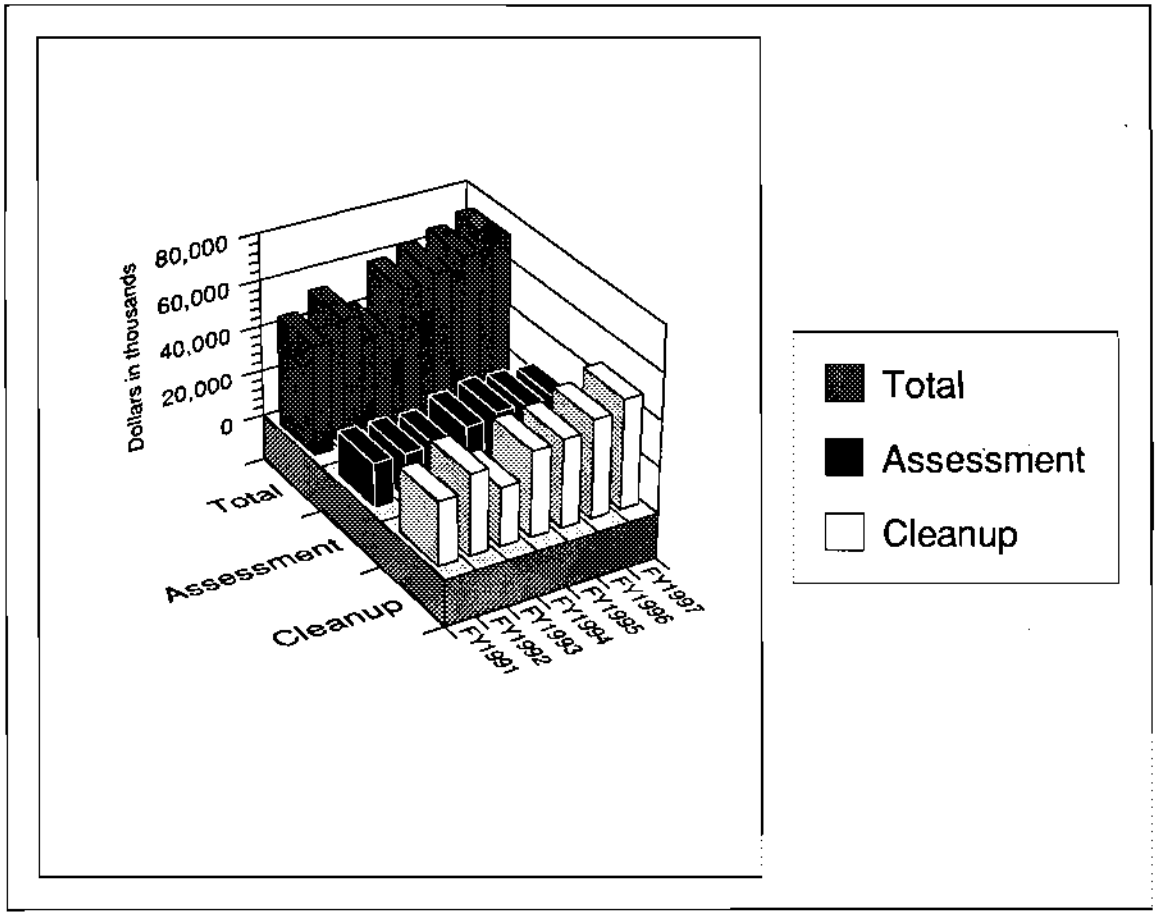
Council lawsuit, investigations, and potential CERCLA activities. Fifteen RCRA sites, including those under the Natural Resource Defense Council Consent Order, are priority sites for closure.

RCRA has been the primary regulatory driver at SRS. A large number of waste sites will either undergo RCRA closures or are in the RCRA Facilities Investigation Program. However, SRS is in the process of negotiating a Federal Facilities Agreement with the State and EPA Region IV. It is expected that the agreement will be finalized by the end of June 1991. As a result of this agreement, all of the waste units will be evaluated to determine whether they are regulated under CERCLA. The D&D Program potentially includes 14 facilities. Progress on D&D activities has been slow because of past funding constraints. To date, only surveillance and maintenance at the Heavy Water Component Test Reactor have been accomplished. In FY 1992, D&D of two experimental separations facilities
(SED I and SED II) is scheduled to begin.

Outyear efforts include completion of the Mixed Waste Management Facility groundwater remediation effort during FY 1997 and completion of the F&H Area groundwater remediation effort during FY 1995.

Figure 2.3.3.11 provides anticipated funding needs.

Further information on SRS is provided in Section 3.



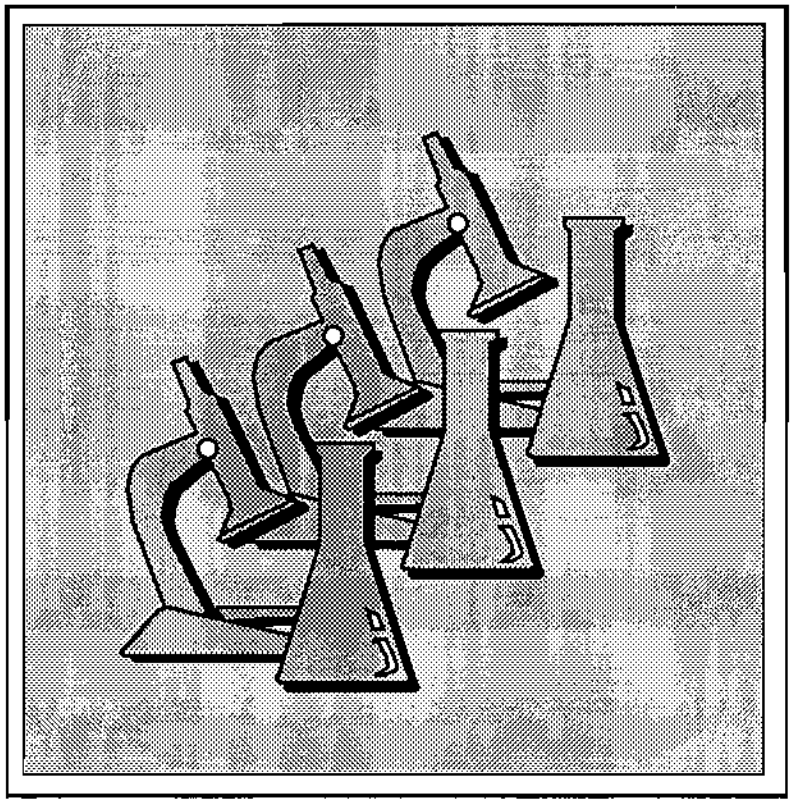
	FY1991	FY1992	FY1993	FY1994	FY1995	FY1996	FY1997
Assessment	19,850	20,044	14,908	24,081	26,561	25,875	25,182
Cleanup	27,650	35,216	30,152	37,130	38,170	42,701	47,454
Total	47,500	55,260	45,060	61,211	64,731	68,576	72,636

(Dollars in thousands)

Figure 2.3.3.11. Savannah River Field Office environmental restoration funding (Validated Target Level).

2.4

Technology Development



2.4.1 TECHNOLOGY DEVELOPMENT MISSION, PROGRAM MANDATES, AND OVERVIEW

Through an aggressive Research, Development, Demonstration, Testing, and Evaluation (RDDT&E) program, the Office of Technology Development (OTD) will ensure that reliable and accepted technologies are ready for implementation and the necessary technically trained work force is available to make the DOE environmental restoration and waste management operations faster, better, safer, and cheaper.

This Five-Year Plan describes the DOE OTD and establishes the course for pursuit of its mission during FY 1993-1997. Earlier activities are introduced to establish the continuity of logic.

A New National Mission: In November 1989, the Secretary of Energy ordered the consolidation of DOE programs in environmental restoration and waste management into a single Office of Environmental Restoration and Waste Management (EM). Within EM, OTD (EM-50) was concurrently formed to establish and maintain an aggressive national program for applied research and development, resolve major technical issues, and rapidly advance beyond current technologies for environmental restoration and waste operations. Through this program, OTD will focus, manage, and accelerate the technology generation cycle (Figure 2.4.1).

The first Five-Year Plan (DOE/S-0070, August 1989) recognized that improved technology tools were required to accomplish DOE goals and that new technologies could make attainment of these goals less costly, more efficient, and more effective. Because investment in research and development (R&D) consistently fares poorly against compliance during competition for funding, DOE/S-0070 aimed to increase R&D funding to about 10 percent of the total program budget, an acceptable broad industry standard. Rather than treat R&D as an entitlement, however, EM-50 established the Draft RDDT&E Plan in November 1989 to found its efforts upon programmatic needs defined in the performance of DOE and EM missions. To help in formulating the definition of needs, comprehensive programmatic roadmaps would be created, and close collaboration with the technological user community would be established and maintained. Furthermore, continued investment in R&D would require that a return on the investment be shown.

Among the needs identified for the EM mission was a work force educated in environmental management and skilled in adapting and implementing new technologies. EM-50 includes a substantial education and technology transfer program designed to meet this need.

Major RDDT&E Areas and Programs: The following three major RDDT&E program areas have been defined: (A) Groundwater and Soils Cleanup, (B) Waste Retrieval and Waste Processing, and (C) Waste Minimization and Waste Avoidance. The Innovative Technologies Program stimulates

the creativity of the technical community, including DOE national laboratories, universities, and private industry. Supporting technologies that serve multiple applications, such as analytical laboratory management, robotics, technology development, international technology exchange, and risk management, are also provided.

Success for EM-50 is defined as the implementation of newly developed technologies in EM programs. Obstacles blocking success have been recognized, and the means for overcoming them are in place. In planning for the third and following years of this endeavor, a more detailed and structured program plan is shown. Already, accomplishments have begun to indicate the return on investment (Sections 1.4.6.3 and 2.4.1.3). The potential return on investment from the focused program planned for 1993 and beyond is great.

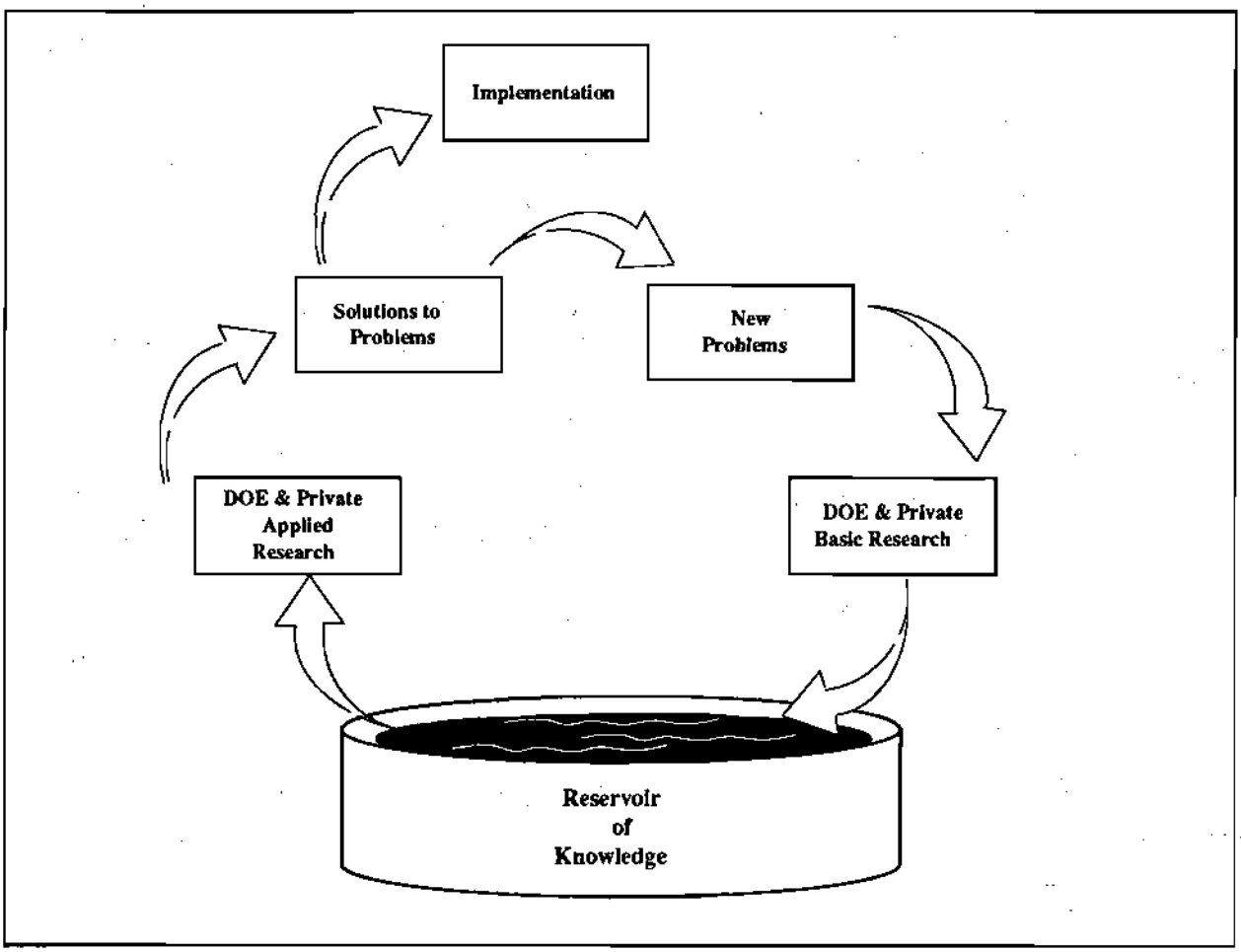


Figure 2.4.1. The technology generation cycle illustrates how, by drawing from the reservoir of knowledge, applied research generates solutions to problems. New problems provide incentive for basic research to generate new knowledge.

2.4.1.1 THE VISION OF TECHNOLOGY DEVELOPMENT: TECHNOLOGY EVOLUTION FOR SOLVING PROBLEMS

"Not the fact avails but the use you make of it."
Ralph Waldo Emerson

The technology generation process may be understood as a set of basic research activities that expand human knowledge, coupled with a set of applied research activities that focus this knowledge to attain specific mission-related goals. Technology integration, including technology transfer, completes the process, overcoming impediments to implementation.

Basic research enlarges the span of human knowledge, adding to an information storehouse at the base of the technology generation cycle. The national emphasis on technology, which has dominated the twentieth century, has recognized that strong basic research programs are essential to technology growth. Government support of basic science, fundamental investigations in physics, chemistry, biology, and geology (as well as mathematics, computing, and simulation), adds to the information storehouse at an unprecedented rate. Only through continued basic research can this information storehouse continue to grow, and only through such growth can the advancements that have characterized the Industrial Age, the Atomic Age, and the Space Age be perpetuated.

Applied research mines the storehouse of new fundamental discoveries and focuses the resultant product toward a purpose. Thus, from advances in biology come (or may come) biotechnical applications—in agriculture, human health, and pollution control—that rely on principles of ecological selection and succession or even on manipulation of the genetic code. Advances in fundamental material sciences enable applications to new sensors and to better, safer handling and disposal of hazardous materials or to development of semiconductor-based machines.

Some of the most useful applications are created by mining different parts of the basic information storehouse and combining the ores to yield synergistic results. Basic chemical knowledge combined with fundamental understanding of the mathematics of systems enables real-time, in situ control of production or remediation. Fundamental advances in the understanding of how fluids and solutes traverse porous, fractured media, combined with computing science and hardware advances, have enabled modeling of the environmental fate of contaminants and promise future gains in the accuracy of such modeling. Indeed, even now as massively parallel processing systems are still on the drawing boards, it is clear that they will be effective in better simulating problems with coupled geochemical-hydrologic models.

Only through continued applied research can the information storehouse be successfully mined to yield faster, safer, better, and cheaper technologies.

Technology integration, including technology transfer, moves the products of applied research into implementation. It also facilitates the movement of new technology and development from one application to another. Promoting acceptance of a new technology by users is one area where technology integration operates; promotion of acceptance by the public and regulators is another. Promotion, however, is not the only direction of information transfer; public concerns are also incorporated into the technology integration process.

As society becomes more highly organized and regulated, technology integration becomes increasingly important. The number of hurdles which must be overcome to use new technologies increases with the number of societal factors involved. Concerns over siting incinerators or other waste processing facilities and waste repositories are major issues. Conceivable applications of biotechnology impinge on societal and ethical questions that have not been and will not be easily resolved.

Education is essential to develop a motivated community capable of participating in the technology generation process. All basic research, applied research, and technology integration are carried out by people. The most significant enhancement to the probability of success at an individual or system level comes from education. Only through focused support to education can the community of technology generators and implementers be expanded.

The technology generation process (Figure 2.4.1.1) has traditionally never been managed as a process. The Office of Technology Development is designed to manage the process and, through efficient management, to accelerate it. The goals, strategy, and organizational mechanisms described in the following pages have been formulated to carry out this management design.

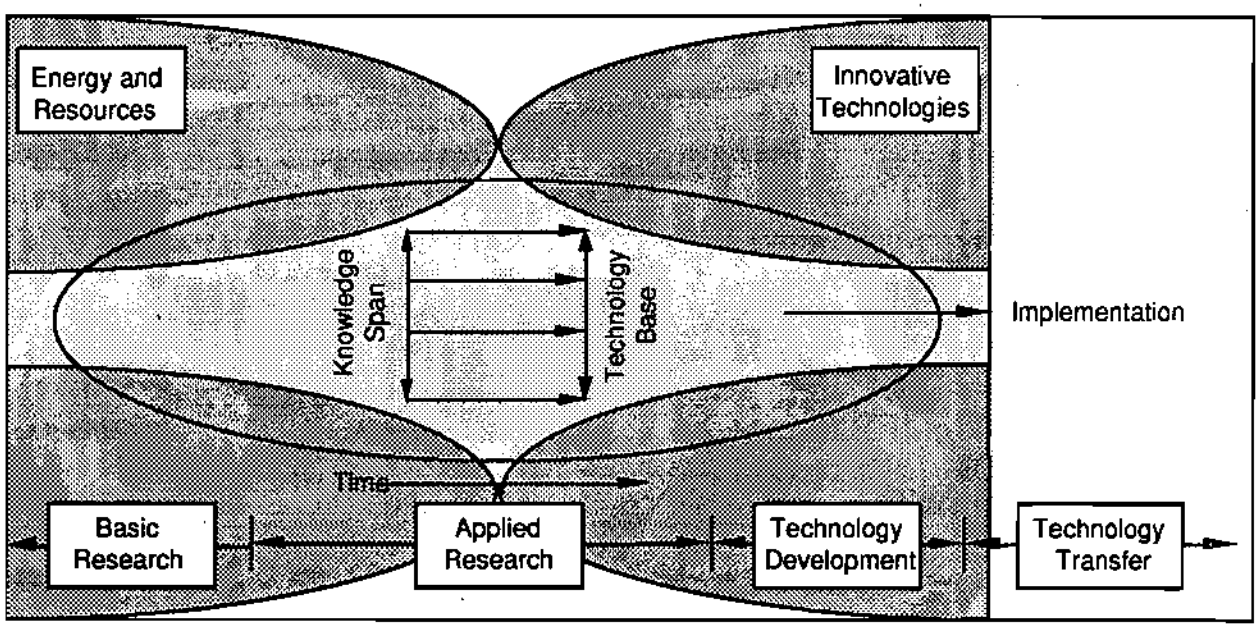


Figure 2.4.1.1. In the technology generation process basic research expands the amount of knowledge; applied research focuses knowledge on solving a problem; and technology transfer takes the knowledge to implementation.

2.4.1.2 THE VISION OF TECHNOLOGY DEVELOPMENT: HOW INTEGRATED DEMONSTRATIONS AND INTEGRATED PROGRAMS WORK

Using Integrated Demonstrations (IDs) and Integrated Programs (IPs), the Office of Technology Development (OTD) will drive the early implementation of new technologies to solve environmental restoration and waste management problems.

OTD accelerates the progression of innovative technology from research in the laboratory —anybody's laboratory — to implementation in the field. At the outset, technology innovation is intrinsically a personal endeavor, an isolated brainchild, normally conceived on a relatively narrow scale set by the individual investigator and his peers. But to be implemented for environmental restoration and waste management, new technologies must be integrated into a coordinated set of operations on a full scale. Furthermore, implementation does not occur within a purely technical context but must be incorporated into the social contexts of laws, regulations, ethics, and economics. In short, implementation must deal not only with things but with people.

Neither the technical nor the societal contexts have ever been successfully managed to fulfill a mandate as large and complex as the EM mission. OTD seeks to manage both the technical and the societal contexts and to manage them as the unity in which they actually exist. OTD uses IDs and IPs to bring about the required organization and coordination.

IDs: Environmental restoration projects proceed through the phases of characterization, assessment, remediation, and monitoring. IDs encompass these same phases and are designed as full-scale pilot environmental restorations in which alternative technical solutions to specific problems can be tested in parallel and in a context that includes consideration of all factors that bear on a full-scale restoration — planning, regulatory permitting, and public acceptance. Similarly, IDs that support waste operations span a complete set of issues. Because multiple technologies are tested together, the advantages of one over another or the gains of combining them can be determined. In addition, operating at full scale may highlight the consequences of applying an inadequate technology that appeared ready in bench-scale tests. Of course, technologies that are tested in an ID will be carefully screened for likelihood of success and for risk so that the occurrence of mistakes is minimized. This screening will be documented in Technology Status Reports.

An ID has three aspects (Figure 2.4.1.2). The operational aspect involves all of the "cradle to grave" phases identified above for an environmental restoration project. The technology filtering aspect involves evaluation and selection of technology from research and development (R&D) for demonstration, testing, and evaluation (DT&E) based on criteria derived from the aim to implement faster, cheaper, safer, and better technologies. The technology integration aspect involves early and

continued interaction among interested States, Federal regulatory bodies, and respective communities to expedite regulatory and public acceptance of technologies in time for implementation. Demonstrated technology is transferred to EM operations, other Federal agencies, and the industrial and international sectors.

IPs: IPs assemble promising applied research activities to maximize the probability of synergy. An IP addresses one or more specific sets of environmental restoration/waste management needs and provides a continuing mechanism to focus R&D activities to develop new technologies, evaluate their relative merit and suitability for various applicable IDs, and advance results rapidly to the DT&E phase. An IP coordinates multiple technical resources to ensure that technical work receives maximum benefit from common activities and applies to the broadest possible range of problems. IPs are directed by OTD management to (1) focus on customer needs, (2) avoid redundancy, and (3) overcome parochialism.

IPs coordinate among multiple laboratories and/or participants to ensure that the fullest possible suite of applications is pursued and that unnecessary repetition of effort does not occur. Management of IPs provides maximum flexibility and allows adaption to environmental restoration/waste management needs. IPs do not form rigorous boundaries to R&D but rather are management tools to promote creativity and collaboration.

The first integrated demonstration was initiated in 1990 and used directional drilling techniques and in-situ air stripping to remediate trichlorethylene in groundwater and soils at the Savannah River Site. In 1991, seven more integrated demonstrations were in the planning stages or actively demonstrating new solutions to waste management problems: (1) Cleanup of VOCs from Unsaturated Soils (Richland); (2) Cleanup of Uranium Contaminated Soils (Fernald); (3) Cleanup of Plutonium Contaminated Soils (Nevada); (4) Underground Storage Tanks (Richland); (5) Environmentally Conscious Manufacturing of Electronics Components; (6) Remediation of Buried Waste (Idaho); and (7) Depleted Uranium Waste Minimization (Oak Ridge). There are 32 currently identified problems for which IDs will be conducted in the next 5 years if funding is provided.

Specific IPs and IDs are discussed in Sections 2.4.6.1, 2.4.6.1.1, 2.4.6.1.2, 2.4.6.1.3, and in the Technology Summaries in Section 3.

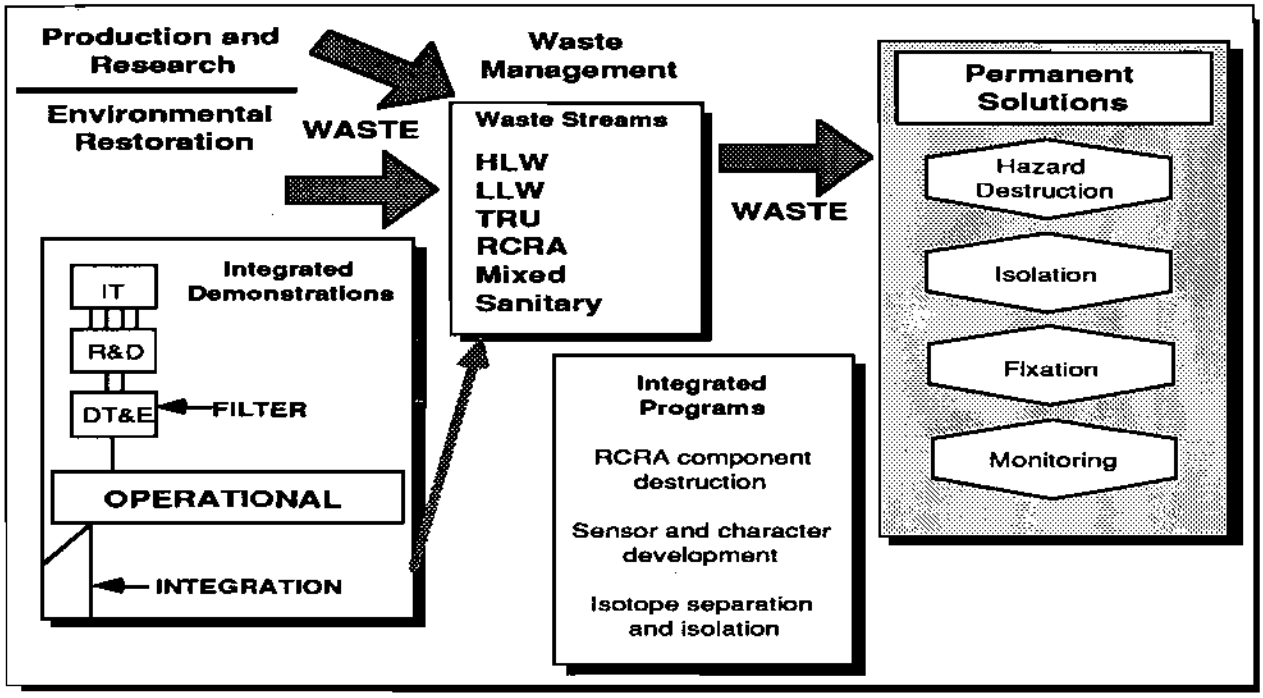


Figure 2.4.1.2. IDs and IPs seek to expedite the movement of wastes from DOE mission activities and from environmental restoration to permanently fixed solutions. (IT = Innovative technology, HLW = high-level waste, LLW = low-level waste, TRU = transuranic)

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2.4.1.3 ACCOMPLISHMENTS: THE RESULTS OF TECHNOLOGY DEVELOPMENT

The vision of technology development is working; useful products are emerging in the form of economic savings, reduced waste generation, novel applications of technologies, and environmental education development.

The proof of technology development lies in faster, safer, better, and cheaper ways of performing EM's mission. After 18 months of investment by the Office of Technology Development (OTD), accomplishments are substantial.

Economic Savings: In Section 1.4.6.3, estimates of savings are shown that outweigh the first-year investment in technology development. Most of the savings shown can be only estimates because they largely represent avoided costs, and costs truly avoided do not appear in a ledger.

Waste Avoidance and Waste Minimization: The smartest way to manage wastes is to avoid making them. Chlorinated hydrocarbon solvents, because of their mobility, environmental persistence, high biological hazard, and the great difficulty in recovering them after they have been released to the environment, are the most generally encountered problem in environmental remediation.

Chlorinated hydrocarbons were eliminated in alloy processing at the Oak Ridge Y-12 Plant. The newly implemented Environmentally Conscious Manufacturing Programs at Sandia National Laboratories and Mound, Pinellas, and Kansas City Plants, as well as a new Memorandum of Understanding with the U.S. Air Force (USAF) and the Boeing Corporation, also target the elimination of chlorinated hydrocarbon use.

Elimination of these chemicals, which have been used at every major DOE manufacturing site, will yield the greatest possible environmental protection and cost savings. Other Federal agencies and many industries will share in these products; the USAF agreement leverages the investment in seeking alternate materials and processes.

Treatment of off-gas and air from virtually all production and research activities involving hazardous or radioactive materials is based on high-efficiency particulate air (HEPA) filters. The filter medium currently used, made from glass fibers, is susceptible to clogging and failure, especially under high-moisture or high-temperature conditions. More significantly, the used filters cannot be recycled, and because they have trapped hazardous materials, they are themselves a hazardous waste product. DOE burial grounds currently dispose of large volumes of these wastes. Cleanable and reusable HEPA filters using stainless steel fibers have been developed by OTD and are now ready for testing in operating air-treatment systems. Treatment technology for the waste stream created by cleaning the filters is being developed and is expected to involve state-of-the-art separation and

destruction, fixation, or recovery of the trapped particulates.

Because OTD has championed aggressive waste minimization goals across DOE's complex (50 to 80 percent decreases by the year 2000), there is increased scrutiny of the processes being used and the search for alternates that require less hazardous materials or that recycle them is intensified. Specific gains from OTD-supported development, such as the HEPA filters, will eventually be outweighed by indirect gains that result from changing the culture in the production and research organizations to avoid waste.

Novel Applications: The first Integrated Demonstration (ID), Cleanup of Volatile Organic Compounds (VOCs) in Saturated Soils and Groundwater, which began at the Savannah River Site where a trichloroethylene plume migrated in a perched groundwater zone, has benefitted from an economy of scale. By combining multiple technology demonstrations at one site, this program has reduced operating overhead related to one-time, one-site characterization, monitoring, and regulatory permit application. The most significant product thus far has been demonstration of the efficiency and cost-effectiveness of the combination of in situ stripping technology with horizontal well installation technology. While neither stripping nor lateral drilling were invented in this ID, this is the first combination of them in a remedial action demonstration.

Applicability at Savannah River has been shown. The technical system has been transferred through nonexclusive licensees to the private sector and will be used to remediate operable units at SR, NASA, Air Force and other DOE-controlled sites over the next 5 years. An extension to include fuels as well as trichloroethylene will enable applications at air bases and airports and many sites with leaking underground storage tanks.

Collection and analysis of samples for hazardous constituents is not only a major cost component in environmental restoration and waste management but also a substantial operating impediment because of the time required to obtain results. OTD has developed a portable ion-trap mass spectrometer that has detection limits for hazardous organic compounds below the required standards and reduces sample processing time to less than half. An in situ fiber-optic-based derivative ultraviolet absorption spectrometry monitor has been developed for organics.

Treatment of wastes and contaminated soils in place to destroy or immobilize hazardous components is generally a preferred option because it causes minimal personnel exposure, reduces the potential for mobilization during cleanup, and avoids the necessity of redisposal. In situ vitrification (ISV) is a technology that was already relatively well-developed in DOE when OTD was formed. Implementation of ISV in remediation of hazardous waste sites, however, must be pursued very deliberately. Because it is so novel and yields a monolithic product, experience in using this technology must be gained gradually. Pilot-scale cold testing for buried waste applications was carried out this year. A hot test, using radioactive sludges in a pilot-scale mockup has been completed. Improvements in electrode feed control, developed this year, enable improved control of ISV, particularly important for treating metal-bearing buried wastes. Originated at the Hanford Site, ISV is being developed and tested for a variety of applications in different environments at

Hanford, Idaho, and Oak Ridge. Close collaboration is maintained among all DOE participants and with the Geosafe Corporation, formed to export the technology to non-DOE applications, so that unnecessary repetition will not occur.

Polychlorinated biphenyls (PCBs), extremely versatile compounds that formerly were used in many ways—in ventilation duct gaskets, transformers, hydraulic fluids, electrical insulators, carbon paper, etc.—were identified as a widespread environmental problem in the 1960s. Along with pesticides that were widely used, PCBs were implicated in causing marked population declines in raptors, such as the peregrine falcon, and the brown pelican. Strict bans on PCB disposal and restrictions on use were imposed. DOE and some industries, however, have to deal with a legacy of PCBs that were formerly spilled, lost, or inadequately disposed of by DOE at the Oak Ridge Y-12 Plant, for example, and by industry in the Hudson River near Schenectady, New York.

Currently, the most promising technology for accelerating in situ remediation of PCBs is biodegradation. Through a new programmatic arrangement called a Cooperative Research and Development Agreement, OTD is leveraging its biotechnology work and drawing upon advanced programs of the General Electric Research and Development Center. PCB-degrading bacteria found at contaminated sites in Oak Ridge are being used in bioreactors for possible treatment of contaminated soils and sediments.

Improved waste treatment to destroy hazardous compounds and eliminate combustible materials is needed. Supercritical water oxidation (SCWO) will destroy most organic compounds and some inorganics. Specific wastes have been identified as candidates for early demonstration of SCWO treatment: low-level radioactive waste oils (28,000 gallons inventory, 4,700 gallons/year generation), transuranic waste oils (8,000-10,000 gallons/year), and PCB liquid waste (1,760 gallons inventory). Similar wastes, including spent solvents, hexone, oil and grease, explosives, and supernatants may also be treatable. Although SCWO is a new technology for which reliable cost figures are not available and costs will depend strongly on the types of wastes to be treated, a projected minimum cost SCWO would compete with incineration.

In other improved waste treatment developments, shakedown tests for a pilot demonstration of plasma arc processing of waste were conducted in Butte, Montana, in cooperation with private industry (Retec) and EPA.

Environmental Education Development: The two DOE academic partnerships identified in the FY 1992-1996 Five-Year Plan now involve 8,600 students and more than 80 faculty either being educated or pursuing 27 collaborative research tasks. Accreditation of the curriculum is under way. A new partnership with Historically Black Colleges and Universities and Minority Institutions (HBCU/MI) has been established. The HBCU/MI partnership currently involves 15 institutions with a combined enrollment of 105,000 students. These programs will yield the next generation of waste managers, equipped to accomplish environmental remediation and to avoid the need for additional remediation in the future.

Other educational initiatives under way include awards to 20 student fellows and 6 young faculty through competitive national selection. Community colleges are being assisted in technician training programs

involving 700 students and 27 faculty. Precollege and public outreach programs related to EM needs have been established at each DOE field office and have thus far reached 137,000 citizens, 122,000 students, and 2,400 teachers.

These accomplishments, though not an exhaustive listing, represent significant advances toward the goals of OTD (Figure 2.4.1.3). They are **faster**—analysis and monitoring of hazardous chemicals in the field saves time during both the characterization and remediation phases. They are **safer**—in situ remediation minimizes the exposure of workers, the public, and the environment to hazardous materials. They are **better**—improved waste treatment leaves a smaller, less hazardous, and more readily fixed residue that is easily susceptible to permanent disposal. They are **cheaper**—advances in waste avoidance reduce both the amounts of wastes that have to be dealt with and the hazards of those that are still generated.

All in all, the accomplishments of the first 18 months of OTD management are deemed to be substantial, cost-effective, and a wise investment. Nonetheless, it is expected that these accomplishments will soon be overshadowed by even greater ones as the management systems started by OTD and described in the following pages fully mature.

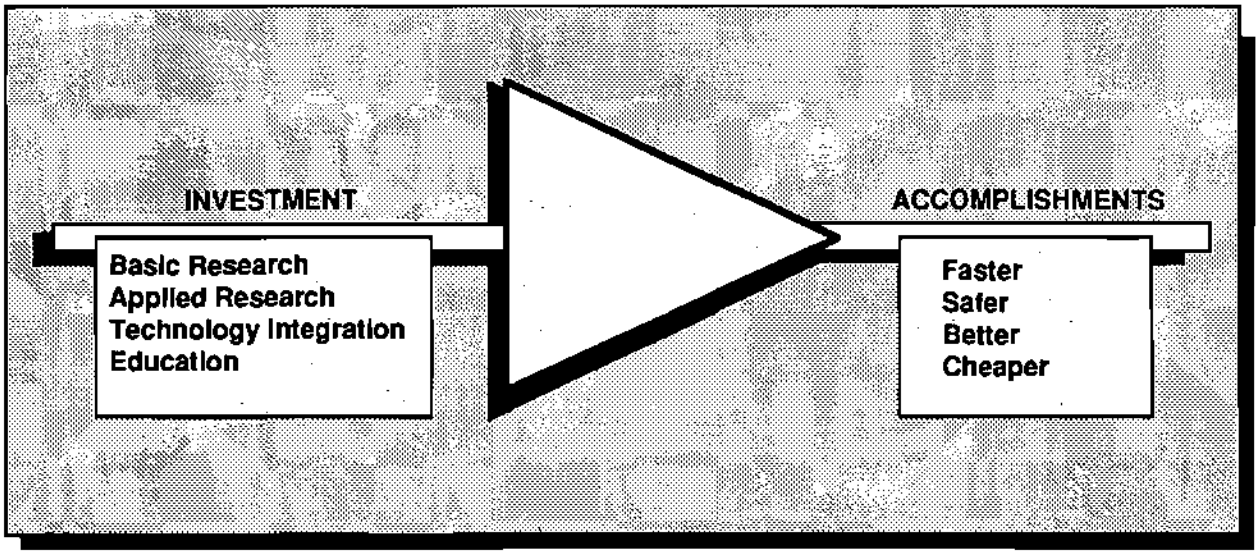


Figure 2.4.1.3. Accomplishments are the amplified products of investment in technology development.

2.4.2.1 PROCESS FOR IDENTIFYING NEEDS

Technology needs are identified and prioritized through programmatic roadmap development, technical working groups and workshops, and by interaction with the user community, including Environmental Restoration (ER), Waste Operations (WO), Defense Programs (DP), Nuclear Energy (NE), Energy Research, and the affected sites.

DOE is undertaking an ambitious Technology Development (TD) Program designed to provide technologies, methods, processes, and analytical tools to achieve compliant and effective waste management and environmental remediation in a shorter time and at a lower cost than is possible with current techniques. TD is responsible for managing this program and developing technological solutions to meet the needs of its user community. This community includes ER, WO, DP, NE, the Office of Energy Research, and DOE sites.

The problems and needs of the user community, which can be mitigated by new or improved technologies, will often exceed the resources available to develop these technologies in a timely fashion. Therefore, it is necessary to evaluate and prioritize users' needs and potential technology options that address those needs, evaluate and select proposals, and apportion resources among them.

Two stages of evaluation and prioritization leading to the TD Program formulation are included within the strategic planning framework depicted in Figure 2.4.2.1. The first is used to rank the needs of the user community; the second is employed by TD to analyze and evaluate technology solutions in response to those needs.

The process begins with a cooperative effort by the user community to identify its technology needs. A close working relationship between the user community and TD ensures that all problems have been identified and that integrated demonstrations (IDs) are planned to address major problem categories.

Needs are identified, analyzed, and prioritized by ER, WO, and, in the case of waste minimization, DP. These needs are based on operational roadmaps derived from appropriate laws, regulations, and agreements; from strategic planning and policy guidance; and from needs assessments by individual DOE sites. Following prioritization, each need is divided into relevant "technology groups," such as characterization technologies, barrier technologies, etc. These technology groups form the basis for integrated programs. The solution to most waste management problems requires a technology system which assembles technologies from several groups.

TD prioritizes the initiation of integrated demonstrations and the selection of technologies funded within integrated programs based on identified ER and WO problems, needs, acceptance criteria, and other parameters, such as the frequency of

occurrence across the DOE complex and institutional and regulatory considerations. Estimated time for the implementation of the technology, likelihood of solving the problem, and availability of funds also affect priorities.

The first ID addressed cleanup of volatile organic compounds (VOCs) for 3 reasons: (1) because VOCs migrate rapidly and can pose a risk to offsite populations; (2) the problem was relatively uncomplicated; and (3) an innovative technology system could be assembled from mature research efforts. The IDs started in FY 1991 build on the data obtained in the first ID and are of increasing complexity and require technologies currently under development. The IDs which will be initiated in FY 1992 and beyond have been staged to build in steps taking less complex problems first and using each successful system as the base for the next.

With the TD Program established (including resource levels), Technical Task Plans and proposals for the required work are requested from national laboratories, site contractors, other Federal agencies, universities, and the private sector. These proposals are evaluated to ensure that those selected for funding are relevant to the EM mission, exhibit technical merit, and meet established programmatic priorities.

Funding of work is based on the result of the prioritization process and subsequent application of evaluation criteria developed by TD. These evaluation criteria include health and safety, cost and schedule, performance, regulatory and legal compliance, and institutional considerations. Industrial procurements follow a merit review process involving competitive procurements to select and award grants and contracts.

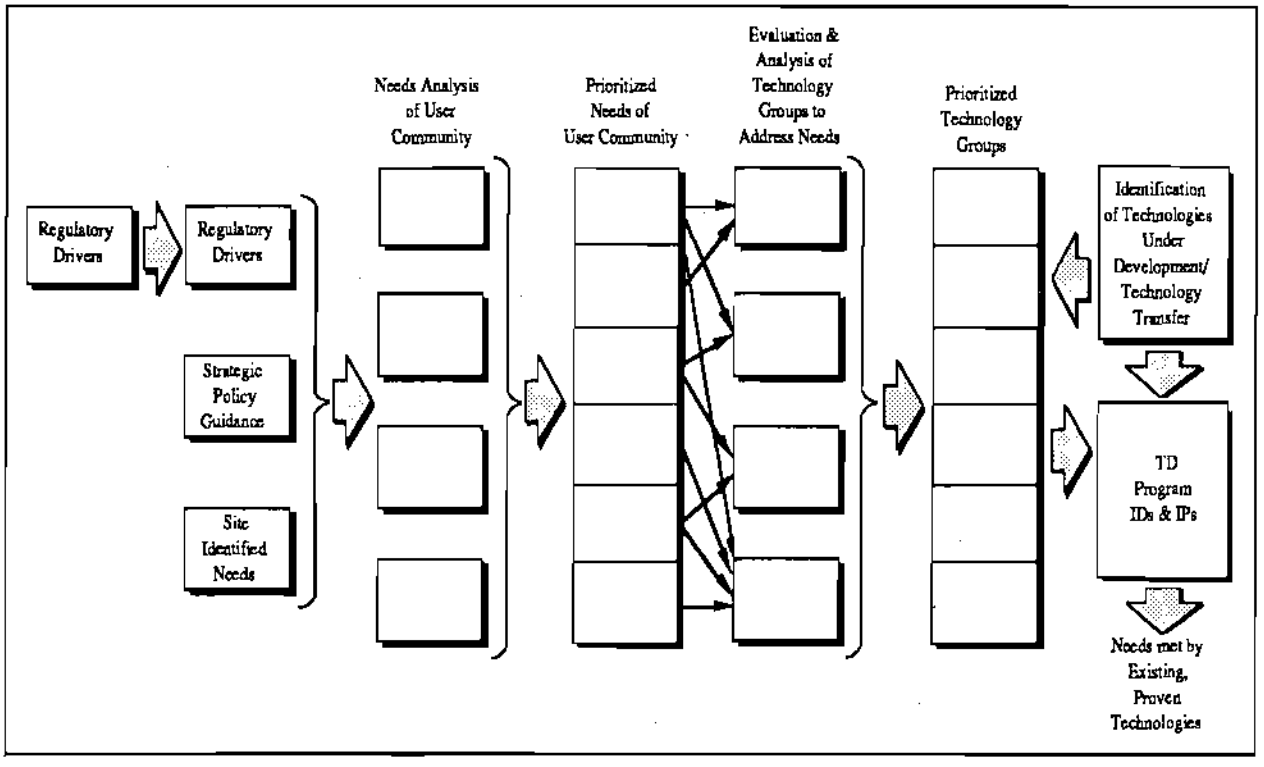
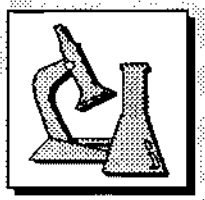


Figure 2.4.2.1. The strategic planning framework for the TD Program involves close cooperation and regular interface with TD's user community.

2.4.2.2 SETTING PRIORITIES AMONG ACTIVITIES IN THE TECHNOLOGY DEVELOPMENT PROGRAM



In addition to technology needs, prioritization of applied research considers the severity of the problem addressed, timeliness, innovation, breadth of application, likelihood of success, and regulatory and social acceptability.

The Technology Development (TD) Program's overall goal is to develop technologies that solve waste management and environmental restoration compliance problems. An effective TD Program depends on the identification of user needs and the reflection of those needs in the TD Program.

The overall planning and prioritization process establishes, in conjunction with the user community, technology solutions to user problems. It also selects which TD Programs should be emphasized to meet near- and long-term requirements. Prioritization establishes the basis for:

- reconciliation of conflicting needs and requirements,
- allocation of available funds consistent with EM goals and priorities,
- justification of supplementary funding levels, and
- provision of useful information for discussions inside and outside DOE.

The planning and prioritization process documents and communicates needs to TD. This process identifies available technologies and stimulates research and development of innovative approaches as well as demonstrations of complete systems to meet identified needs.

As discussed in Section 2.4.2.1, two stages of prioritization guide the TD Program formulation. The first stage reconciles user problems and needs and identifies the highest priority needs. The second stage is used by TD to prioritize technology solutions designed to address user requirements (Figure 2.4.2.2).

Prioritization of Needs: The preparation of a prioritized set of problems and needs facing the user community is the responsibility of the user community working in conjunction with TD. The process is founded on a needs assessment based on operational roadmap information, individual needs assessments and prioritization by the DOE sites, and Headquarters-provided strategic planning and policy guidance. The assessment will also include, where possible and appropriate, "acceptance" criteria or standards for each identified need. This assessment is prioritized by representatives of the user community working in conjunction with TD. In the process of setting priorities, those representatives resolve conflicting or unrealistic priorities and requirements among individual users.

Prioritization of Solutions: Given the prioritized set of problems and needs facing the user community, TD, with the assistance

of the user community, identifies groups of technologies associated with each need. Technology groups, such as characterization technologies, are directly traceable to one or more user-defined needs.

Once a need is broken down into technology groups, the groups are organized and analyzed to quantify the benefits and probability of success. Peer review groups are used to ensure that the best and most promising technologies are selected for development. Many user-defined needs will require the same technologies. The TD Program addresses the more frequently occurring technologies, both within DOE and nationally.

The groups of technologies are prioritized to establish a responsive TD Program based on a variety of factors, including frequency of need across DOE sites, health and safety considerations, commitments made in regulatory compliance agreements, level of technology development (e.g., the state of knowledge and feasibility of timely implementation of the technologies being considered and the status of integrated demonstrations) cost-effectiveness, institutional and policy considerations, and the availability of resources.

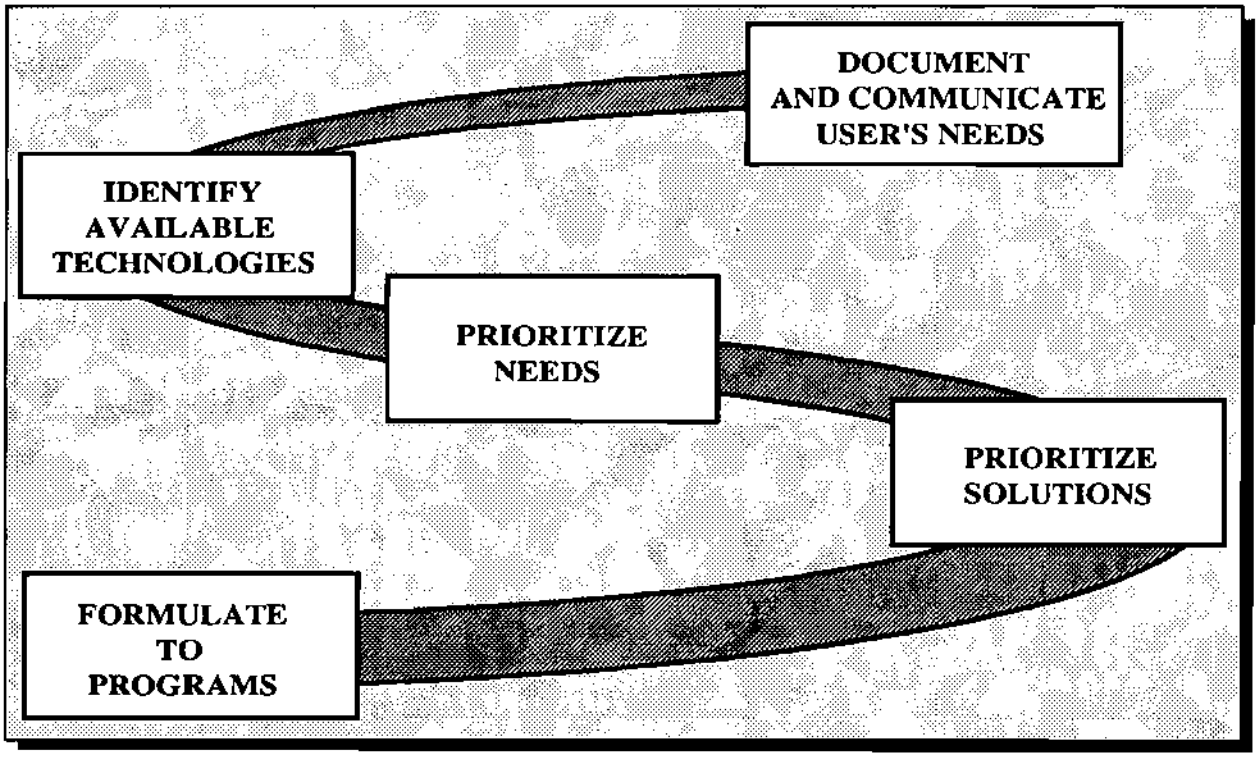


Figure 2.4.2.2. Dual prioritization within the technology development process ensures support for needs most likely to generate a high return on investment.

2.4.3 ADDRESSING POTENTIAL OBSTACLES

A technically sound, Headquarters-directed program attacks potential obstacles to cost-effective technology development, such as institutional parochialism, redundancy in programmatic activities, and continuation of research which fails to progress.

To efficiently carry out the Technology Development (TD) Program, potential obstacles to success must be identified and a strategy to overcome them must be developed. Because implementation of new technologies is the ultimate measure of TD Program success, obstacles are defined as institutional or operational barriers to implementation. Examples of such obstacles are the "not-invented-here" syndrome, the development of essentially identical products in multiple organizations at multiple sites, and the inertial resistance to redirection or termination of projects once they start (Figure 2.4.3). Because these obstacles diminish the cost-effectiveness of and reduce user community confidence in TD programmatic efforts, it is imperative that a strategy be pursued to mitigate their negative effects.

Attacking Not-Invented-Here Syndrome: The not-invented-here syndrome refers to the resistance to application of ideas developed at other locations or in other institutions. To some extent, the concept is founded on a healthy skepticism, but in its extreme, it becomes a serious impediment to progress. The Office of Technology Development (OTD) addresses this issue through the organization of Integrated Programs (IPs) and Integrated Demonstrations (IDs) that promote collaboration among investigators from multiple DOE national laboratories, universities, and private industry. This strategy enhances communication among participating organizations and provides each organization with a role in project planning and conduct, offsetting the not-invented-here syndrome.

Attacking Unnecessary Redundancy: Parallel development of new technologies is a natural result of the systemwide pursuit of new knowledge and application of the newest technologies to the solution of problems. To the extent that parallel development efforts stimulate a healthy competition, some redundancy is acceptable. To maximize efficiency, however, independent activities must be coordinated to avoid unplanned exact replication of effort. Management design strategies to address this issue include Headquarters overview of technical activities to recognize relationships among them, collaboration among investigators to focus primary strengths on program needs, and frequent review to evaluate project status and ensure that opportunities for synergistic combinations of projects are pursued.

Attacking Inertia: The natural tendency of projects to continue, once initiated, requires a strategy to ensure that the work remains relevant and cost-effective. Projects that fail to progress in the direction of solving program needs must be redirected or terminated. Management and technical reviews are regularly conducted to ensure continued relevance of the work to programmatic requirements, quality of

performance, and adherence to budgetary and schedule commitments.

The IP/ID program management structure described in this Five-Year Plan provides an excellent basis for addressing the potential obstacles to an effective TD Program. By focusing attention on top-down planning to prioritize and address needs drawing from the most suitable capabilities within the Research, Development, Demonstration, Testing, and Evaluation community, the IP/ID system stimulates an elevated level of communication among participants.

Attacking Irrelevancy: Some portions of the technology development user community perceive that the TD Program does not truly address their technology needs. OTD's strategy to overcome this perception includes support for the development of operational roadmaps that indicate the opportunities for introducing new technologies and involving the user community in establishing TD programmatic priorities. While these steps will help overcome perceptions of irrelevancy, the ultimate establishment of confidence can only occur through solid performance. Thus, OTD must demonstrate a track record of successful and timely delivery of new technologies that are actually implemented. Early implementation will be facilitated through the involvement of the user community in ID planning and oversight.

Attacking Regulatory Impediments: Both State and Federal regulatory impediments to new technology implementation exist. For example, under RCRA, the clean products derived from treatment of listed hazardous substances are themselves considered to be hazardous until they are delisted. Delisting is difficult to obtain and generally must be based on known homogeneous waste streams. The waste streams generated by environmental restoration activities are most often unknown and are rarely homogeneous. Another example under RCRA is the "placement" issue, which may preclude the disposal of treated wastes from a restoration site at the site from which they were removed. Finally, for sites where a cleanup plan has been developed and a Record of Decision prepared, the introduction of new technology may require reopening the entire remediation issue, which may not be possible.

Regulatory impediments are addressed through early and continuous involvement of regulators in the ID process.

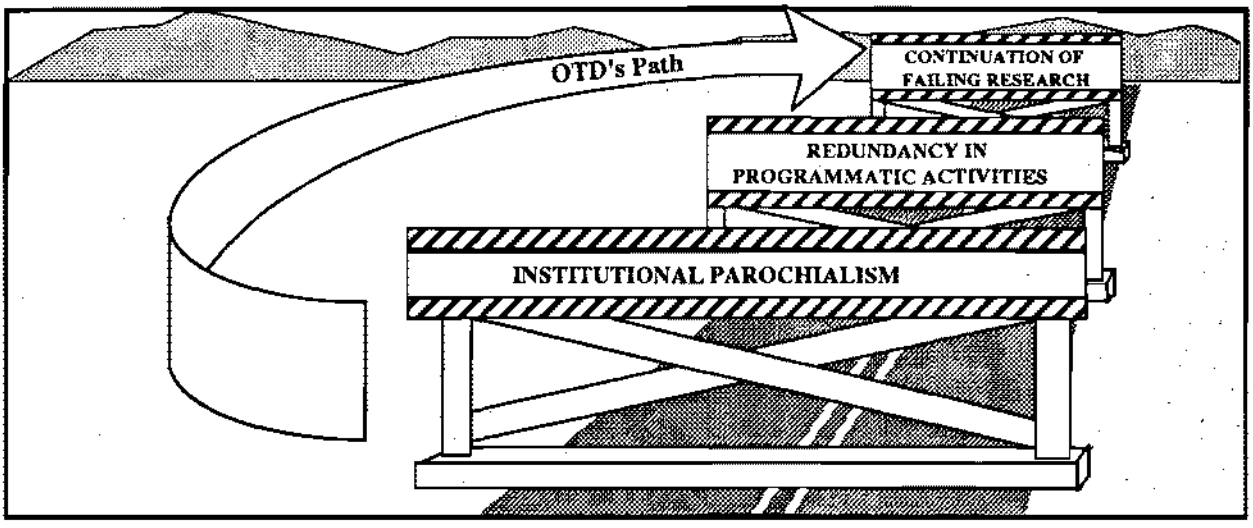
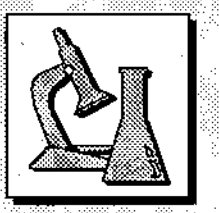


Figure 2.4.3. OTD is demonstrating a well-planned path that avoids obstacles to cost-effective technology development.

2.4.4 STRATEGIC GOALS AND OBJECTIVES



Consistent with the overall mission for the Office of Technology Development (OTD), the following strategic goals were established: (1) focus applied Research, Development, Demonstration, Testing, and Evaluation (RDDT&E) on needed solutions for Technology Development (TD) customers, including Waste Operations, Environmental Restoration, Defense Programs, Nuclear Energy, and Energy Research; (2) minimize duplication of technology development within the DOE complex; (3) leverage technology development through joint programs and consortia; (4) maximize technology transfer in and out of DOE; (5) achieve early and broad regulatory acceptance for new or improved technologies; and (6) ensure technical work force availability to support DOE's 30-year cleanup goal.

Unlimited funds will surely not be available to accomplish all applied RDDT&E activities for achieving better, faster, cheaper, and safer environmental restoration and waste operation activities. Accordingly, the strategic goals established for OTD are designed to ensure a focused program; minimized duplication; leveraged technology; maximized technology transfer; ensured regulatory acceptance; and technical work force availability to support DOE's 30-year cleanup goal.

A Focused Program: OTD focuses the program on scope, timing, and cost. Focus on scope can be defined as addressing identified users' needs, working with the users to ensure acceptance of the product, and taking a systems view to ensure that the product fits into the operational context of the user community. Focus on timing can be defined as being aware of the users' regulatory and programmatic milestones and ensuring that technology development supports these milestones. Focus on cost means that OTD accounts for the cost and benefits of the new technology as it is being developed to ensure a cost-effective product.

Minimized Duplication: OTD minimizes unnecessary duplication of efforts by assigning tasks to the most promising projects and creating work that is complementary, not duplicative.

Leveraged Technology: Leveraging technology is one of the most effective ways to "stretch" limited research dollars. EM shares many problems with other Federal agencies and the private sector. Where possible, OTD establishes joint programs and consortia to permit common problems to be addressed more efficiently and cost-effectively.

Maximized Technology Transfer: Technology transfer into DOE takes advantage of ongoing research. OTD strives to counter the existing barriers to effective technology transfer into DOE through innovative contracting approaches. These approaches seek to ensure that industry simultaneously meets its goals of profitability and market development, while applying technology to environmental restoration and waste operations problems. In contracting with the private sector, OTD

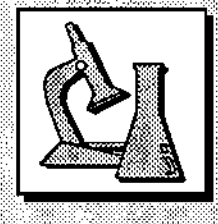
honors intellectual property, ensures competitive awards and reasonable profits, and seeks equitable and fair allocation of liability. Technology transfer from EM to other Federal agencies and the private sector will enhance DOE's national capacity to retain a clean environment and stay internationally competitive.

Regulatory Acceptance: Early and broad regulatory acceptance for new and improved technologies is key to an effective TD Program. OTD involves the regulatory community early in the development process and keeps it informed as the research and testing progresses. Early and regular involvement with the regulatory community permits more efficient identification of data requirements and ensures that these requirements are properly satisfied in the research and test programs. OTD strives to work across regulatory regions to ensure broadest possible acceptance of technology products.

Technical Work Force Availability: OTD intends to develop retraining and specialty programs for the existing work force and programs at all levels of schooling to ensure that the requisite technical personnel resources are available to meet EM challenges. In meeting this goal, OTD will emphasize Historically Black Colleges and Universities, involvement of under represented groups, and Indian involvement.

Further specific objectives are listed in Section 2.4.7.

2.4.5.1 TECHNOLOGY DEVELOPMENT MANAGEMENT STRUCTURE



To ensure that the Office of Technology Development (OTD) is responsive to the needs of its customers, the Technology Development (TD) Program is centrally managed. Centralized management (1) coordinates solutions to multisite problems; (2) avoids redundancy in Research, Development, Demonstration, Testing, and Evaluation (RDDT&E) activities; and (3) enables more efficient internal and external communications and technology transfer.

OTD manages an aggressive national program to:

- accelerate the development of new technologies to solve environmental restoration and waste operations problems as well as improve environmental restoration and waste management effectiveness, efficiency, and safety;
- enhance educational programs and initiatives and encourage collaboration and technology transfer among Federal agencies, State and Tribal governments, industry, academia, and the international community; and
- provide for safe, secure, and economical transportation of DOE hazardous and radioactive materials.

The centralized OTD management structure is designed to enhance communications within DOE and with other Federal agencies, States, and private organizations. It also facilitates the two-way transfer of technical information and methods among EM, other organizations, and industry. The OTD management structure provides a consolidated and integrated national perspective on transportation management activities and education activities. These education activities are designed to ensure the availability of the human resources necessary to achieve DOE's cleanup goal. The OTD organization (Figure 2.4.5.1) includes the Transportation Management (TM) Staff, the Technology Integration and Environmental Education Development (TIEED) Division, the Program Support (PS) Division, the Research and Development (R&D) Division, and the Demonstration, Testing, and Evaluation (DT&E) Division.

The TM Staff manages programs that ensure the safe, secure, and economical transportation of DOE materials, including radioactive and other hazardous materials and waste, to meet the needs of all DOE elements (including EM). The staff is organized into five functional areas: transportation technology, transportation operations, transportation emergency preparedness, institutional support, and information and communications.

TIEED manages programs to stimulate the education of technical personnel for EM tasks and to facilitate technology transfer. Technology transfer includes efforts to transfer demonstrated technology out of the DOE complex and activities for the transfer of technologies residing in the private sector and other sources into the DOE system. A major focus of the Division is to ensure

early regulatory acceptance of the technologies developed as a result of RDDT&E activities.

PS provides management, financial, and internal program support to TD. In addition, the Division administers certain supporting technologies programs, including analytical laboratories management and international technology exchange.

R&D develops innovative technology through applied R&D programs. Its responsibilities include managing an aggressive R&D program to provide less costly, more effective, and more efficient technical solutions to environmental restoration and waste management needs.

DT&E identifies technologies in the applied R&D stage of development that are amenable to transition to the demonstration arena. The Division is also responsible for managing programs to demonstrate, test, and comprehensively evaluate technologies before they are applied to environmental restoration and waste management problems.

In practice, R&D and DT&E work closely together to identify technology development requirements that are responsive in scope and timing with user-identified programmatic needs, identify research programs consistent with those requirements, monitor R&D projects, and coordinate the identification and screening of projects ready for demonstration and implementation. The R&D and DT&E Divisions are each organized into two branches, Environmental Restoration and Waste Management, to provide better focus to and more responsive direction of RDDT&E activities.

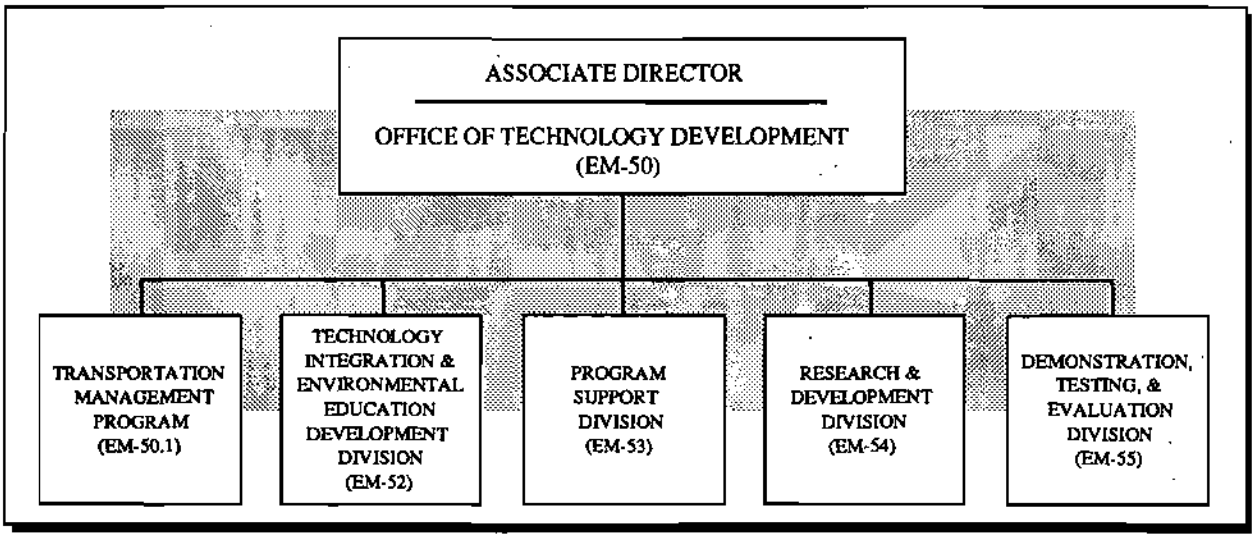


Figure 2.4.5.1. Organization of OTD facilitates implementation of EM needs.

2.4.5.2 MANAGEMENT SUPPORT FOR TECHNOLOGY DEVELOPMENT

An extensive support program involving Program Coordination Offices (PCOs), Technical Program Officers (TPOs), and Technical Program Managers (TPMs) allows the Office of Technology Development (OTD) to mobilize strong participation by other Federal agencies, industry, academia, and DOE national laboratories.

Management of technology development (TD) requires a broad set of organizational ties with other DOE units, including field offices, PCOs, technical committees, and working groups.

Field Office: DOE field offices exercise day-to-day management of Research, Development, Demonstration, Testing, and Evaluation (RDDT&E) activities. Each field office has appointed a TPO to serve as the primary contact between that office and OTD. The TPO provides administrative coordination and implements the TD Program. The TPO also works with the user community to ensure that OTD-sponsored projects are responsive to actual technology needs.

Each national laboratory or major DOE support contractor performing RDDT&E work for field offices has appointed a TPM to be the principal contractor contact and to coordinate the RDDT&E activities performed by the national laboratory or contractor. The TPM reports to the TPO for programmatic direction and guidance.

PCOs: PCOs are established at the Idaho Field Office, Chicago Field Office, Oak Ridge Field Office, and Albuquerque Field Office for Innovative Technology, Applied Research and Development (R&D), Demonstration, Testing, and Evaluation, and Education programs, respectively.

At the request of OTD, PCOs assist in preparing for program reviews, analyzing technical data and information, providing alternative technical approaches, collating fiscal data, and performing other technical and administrative support activities.

Internal and External Coordination: Technical committees and working groups, along with OTD staff, provide coordination within DOE. External coordination is provided by close working relationships among OTD, committees, and groups established to facilitate non-DOE communications. For example, OTD coordinates and works closely with the Superfund Innovative Technology Evaluation Program, the Interagency Working Group for Hazardous Waste Technologies, the State and Tribal Government Working Group, and other similar organizations.

Technical review committees, composed of panels of impartial and highly qualified scientists and engineers, are convened on an ad hoc basis to provide technical review and make recommendations to OTD regarding a wide range of technical issues on specific TD activities.

Coordination with the Office of Energy Research (OER): The OTD R&D Division serves as the liaison to OER and provides guidance to OER on basic research needs of the EM organization. Coordination with OER includes an annual review of basic research projects that are relevant to RDDT&E and preparation of a management plan covering expected time for implementation of technologies. Anticipated reductions in risk, adverse health effects, cost, and links to near-term mission needs are addressed.

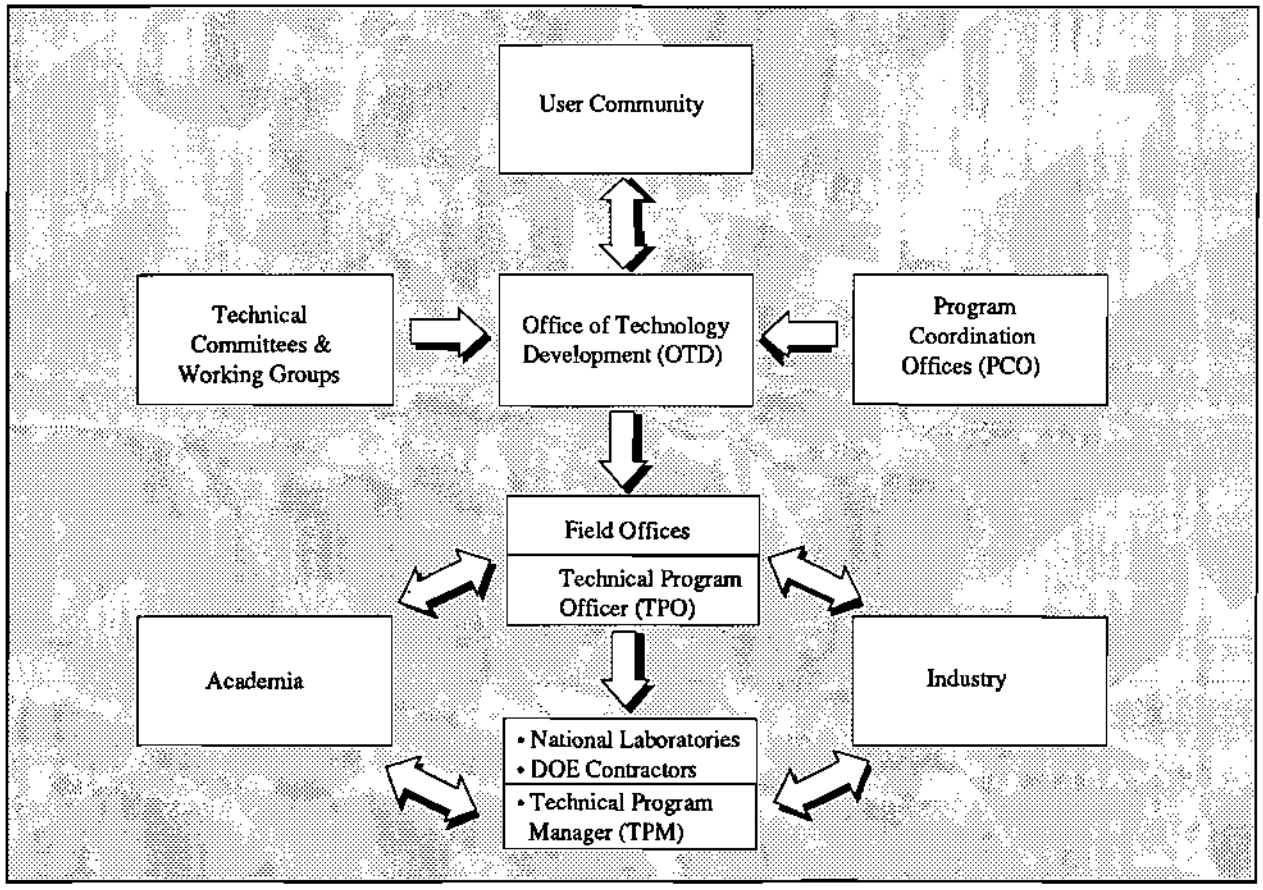


Figure 2.4.5.2. Effective centralized management of TD by OTD requires regular liaisons with Environmental Restoration and Waste Operations to establish technology needs and ensure responsiveness. It also requires teamwork and support from field offices, working groups, committees, industry, and academia.

2.4.6.1 DESCRIPTION OF TECHNOLOGY AREAS IN THE RESEARCH, DEVELOPMENT, DEMONSTRATION, TESTING, AND EVALUATION PROGRAM

The Research, Development, Demonstration, Testing, and Evaluation (RDDT&E) Program is executed in three phases, encompassing three technology areas: Groundwater and Soils Cleanup, Waste Retrieval and Waste Processing, and Waste Minimization and Waste Avoidance.

The Office of Technology Development (OTD) executes four major programs: RDDT&E, Supporting Technologies, Technology Integration and Environmental Education, and Transportation Management. The first three programs are discussed in Sections 2.4.6.1-2.4.6.3. Section 2.5 of this document discusses the Transportation Management program.

RDDT&E Program: The RDDT&E Program is organized into three major applications areas that encompass the principal components of environmental restoration and waste management operations: (A) Groundwater and Soils Cleanup, (B) Waste Retrieval and Waste Processing, and (C) Waste Minimization and Waste Avoidance.

Integrated Programs and Integrated Demonstrations (IPs/IDs) within the Applications Areas A and B directly address the primary OTD mission to develop technologies for Environmental Restoration and Waste Operations. Technologies for destruction, removal, isolation, or immobilization of hazardous components of past and present wastes are evaluated and eliminated or promoted by these IPs/IDs.

Groundwater and Soils Cleanup: These activities are intended to remove or reduce hazardous radioactive and/or toxic materials from contaminated soils and groundwater. Activities to provide interim or temporary containment of hazardous or radioactive materials until a suitable technology can be applied are also included.

Waste Retrieval and Waste Processing: These activities are intended to remotely or otherwise excavate or remove contaminated material from the site or tank, process contaminated material into a suitable form for shipping and/or disposal, treat and dispose of waste arising from operations, and decontaminate and decommission materials, equipment, and facilities.

Waste Minimization and Waste Avoidance: This activity is defined as reduction, at the source, in toxicity or amount of hazardous materials resulting from the production of nuclear weapons. The primary responsibility for waste minimization in the DOE weapons complex lies with Defense Programs (DP). DP has the obligation to ensure that the manufacturing and supporting processes produce minimal quantities of hazardous wastes as is technically and financially feasible. The Technology Development Program provides support to the development of waste minimization technologies because waste minimization is the only way to control the life cycle cost of waste management and prevent future liabilities. Technical approaches include solvent substitution to reduce or eliminate the use of hazardous chemicals, development of alternative metal-forming processes that consume less stock

and yield less waste, and the recycling of scrap.

Supporting Technologies Program: This program encompasses four crosscutting topics: analytical laboratory management, robotics technology development, coordination of international technology exchange activities, and decision support. Regulatory and planning requirements for environmental restoration and waste processing control have created unprecedented needs for documented and defensible analytical data on a wide array of substances. These needs cannot be met with presently available technologies in today's laboratories. Robotics may be applied to meet analytical needs as well as serve many cleanup and processing requirements. International exchange of information on state-of-the-art technical applications and Environmental Restoration/Waste Operations management strategies is aimed to increase the efficiency of technology development. Decision support will provide opportunities for the most significant reductions if risk assessment methods that are accepted by the regulatory and social communities can be achieved.

Technology Integration and Environmental Education Program: This program includes technology transfer, both into and out of the RDDT&E activities, regulatory coordination, public involvement, and the training of a work force that can safely carry out the Environmental Restoration/Waste Operations mission using new, advanced technologies. Technology which already exists outside the DOE complex will be imported or adapted, but not reinvented. Changing technologies and the greatly increased scale of environmental management programs inside and outside the DOE demands a technical work force which does not presently exist but which can be built through education.

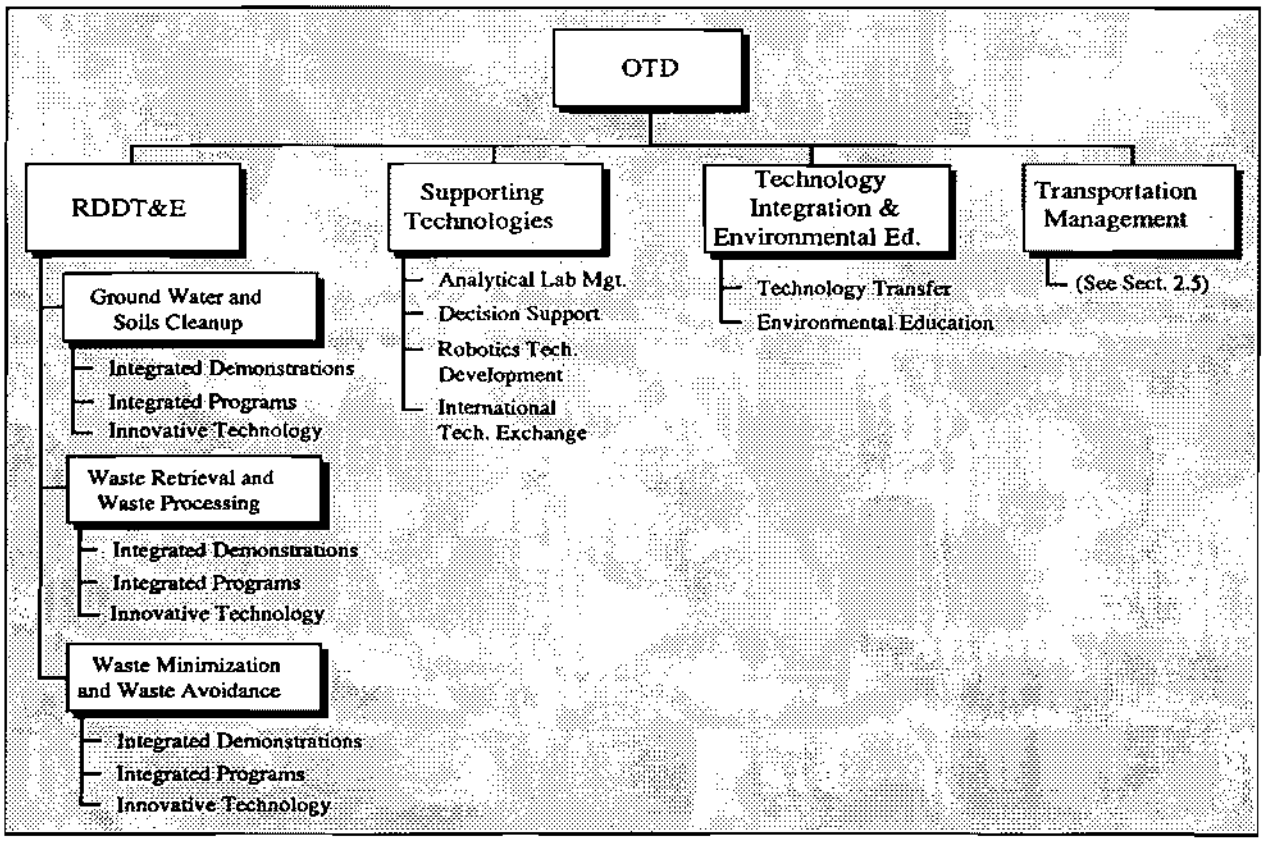


Figure 2.4.6.1. Four major programs compose OTD.

2.4.6.1.1 APPLICATIONS AREA A: GROUNDWATER AND SOILS CLEANUP

The most pressing technology need for environmental restoration involves the containment and cleanup of soils and groundwater that have been contaminated by radioactive and hazardous chemicals from facility operations.

As the Office of Technology Assessment has indicated (*Complex Cleanup*, February 1991), contaminated groundwater and soils significantly challenge the 30-year cleanup goal. Depending on the scale of contamination and whether migration of contaminants has occurred, the cost and level of effort required to achieve the cleanup goal may be very high and the need for action immediate. Factors that affect prioritization include the source of contamination, characteristics of the contaminants involved, natural transport and dispersal processes, and the current availability of adequate technology for characterization, monitoring, and remediation.

Sources of contamination to soils and groundwater include previous disposal of contaminated wastes in ponds, seepage pits and trenches, and shallow land burial sites; spills and leakage from waste transport and storage facilities; and discharges to the air and surface waters.

Higher priority must be given to contaminants that exhibit high toxicity, long-term persistence in the environment, and high mobility and that are present in large quantities or at high concentrations relative to levels of concern for human and ecological health. Mobility in the environment is of particular concern in determining the need for immediate action because it controls the tendency of problems to expand.

Existing Integrated Programs (IPs) and Integrated Demonstrations (IDs): Two ongoing IPs that are related to groundwater and soils cleanup are the IP for In Situ Remediation Technology Development and the IP for Characterization and Sensor Technology Development. The first is devoted to conducting environmental restoration activities without retrieving and redisposing of large volumes of wastes and contaminated materials. In situ technologies avert exposure of personnel to excavated materials and are less likely to mobilize contaminants. The second addresses characterization and monitoring needs. Access to the subsurface often requires installing costly drill holes that reduce the natural containment integrity of the site.

The First ID: The first ID, focused on groundwater and soils cleanup, is directed toward the removal of volatile organic compounds (VOCs) from saturated systems. Conducted at the Savannah River Site (SRS), where a trichloroethylene (TCE) plume exists, this ID also relates to other contaminants, such as perchloroethylene (PCE) or hydrocarbon fuels. TCE, PCE, and fuels in soils and groundwater exist at several DOE sites in addition to SRS. Because VOCs move through soils as vapors, in groundwater solution, and as a separate liquid phase, the spreading and dispersal of these contaminants is likely.

Other Ongoing IDs: In addition to the ID for VOCs in saturated media, the following three IDs are now fully operational: cleanup of plutonium in soils, cleanup of uranium in soils, and cleanup of VOCs in unsaturated soils. Cleanup of plutonium in soils is based at the Nevada Test Site, where soil contamination has occurred as a result of a series of tests conducted at the ground surface. However, these tests did not involve nuclear detonations. Cleanup of uranium in soils is based at the Fernald Site in Ohio, where uranium oxide dust has escaped through air handling equipment. While these sites were selected as locations of major soil contamination problems, several additional sites are still contaminated with plutonium and uranium. Cleanup of VOCs in unsaturated soils is centered at the Hanford Site although VOCs occur in the soils of essentially all DOE sites in the arid West.

Anticipated New IDs in 1993: Four new IDs will become fully operational in FY 1993. These are cleanup of nonplutonium/nonuranium metals in soils, cleanup of toxic chemicals in soils, cleanup of non-VOCs in saturated soils and groundwater, and cleanup of non-VOCs in unsaturated soils. Metals other than plutonium and uranium contaminating DOE site soils include mercury, chromium, nickel, lead, cadmium, and others. Fixation, extraction, or isolation of these metals to prevent their entering food chains or water supplies could be necessary. Non-VOCs, such as polychlorinated biphenyls, contaminate soils at some locations and require remediation technologies different from those for VOCs.

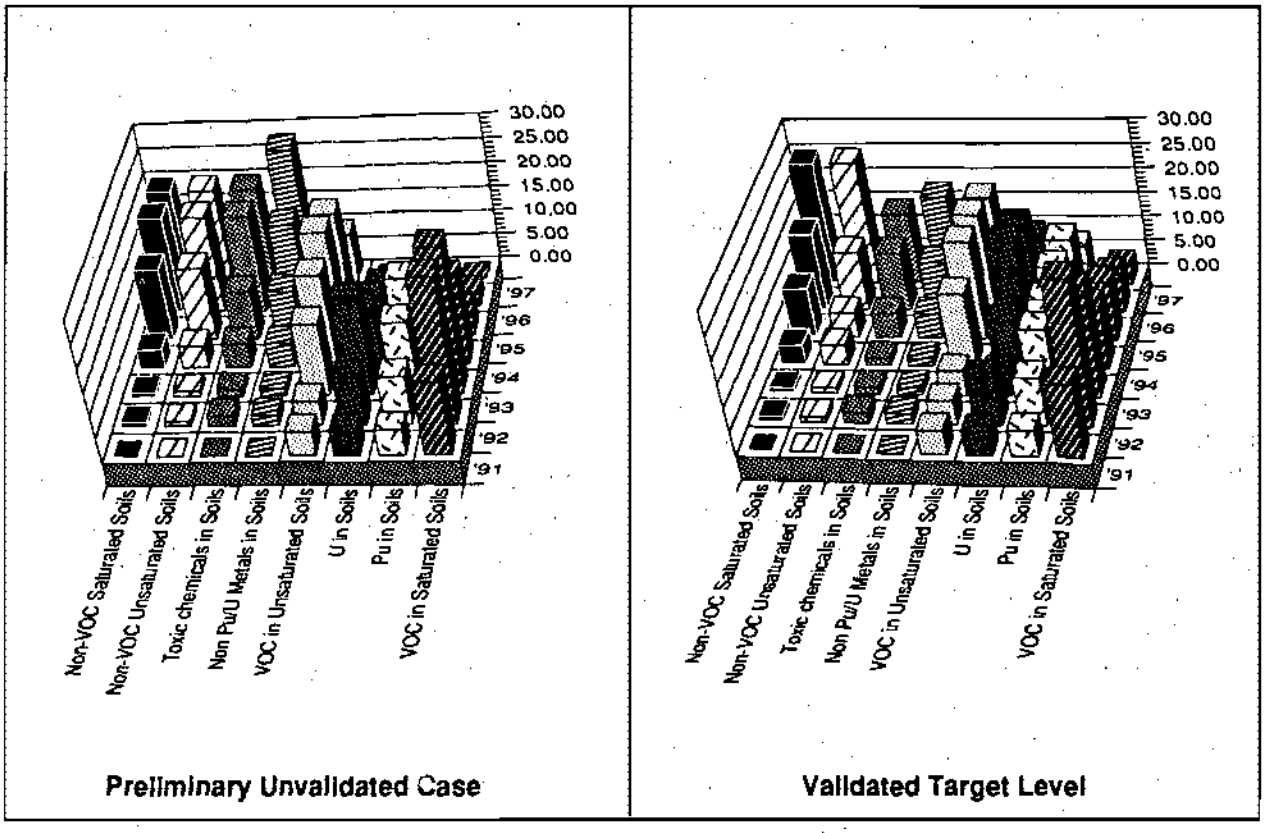


Figure 2.4.6.1.1. Planned funding for groundwater and soils Integrated Demonstrations is subject to change in response to programmatic requirements. Groundwater and soils cleanup activities support the primary Environmental Restoration Program mission. Actual funding will depend on fiscal constraints and programmatic requirements. (funding in $ millions)

2.4.6.1.2 APPLICATIONS AREA B: WASTE RETRIEVAL AND WASTE PROCESSING

Technologies for economic and safe retrieval of wastes, coupled with improved processing to destroy or isolate hazardous constituents, will revolutionize waste management operations.

Waste retrieval and waste processing constitute the largest segment of the EM mission. Present technologies to complete this mission are often inadequate and expensive. A number of Integrated Programs (IPs) and Integrated Demonstrations (IDs) are planned to address specific aspects of waste retrieval and processing (Section 3, Technology Summaries).

The Buried Waste ID, focused on buried transuranic wastes, is centered at the Idaho National Engineering Laboratory. The objective is to compare an array of technologies for in situ remediation and retrieval, separation and concentration, and treatment and disposal of mixed wastes from buried waste sites. Large volumes of buried mixed wastes are also present at the Hanford Site, Oak Ridge Reservation, Los Alamos National Laboratory, Nevada Test Site, and the Savannah River Site. Technology advances from the Buried Waste ID will have applications at those locations.

The Underground Storage Tank ID is based at Hanford, with the largest number of diverse and challenging tank problems. The objective is to identify, develop, test, evaluate, and transfer technologies for remediation of radioactive and mixed waste in underground storage tanks. Other tank remediation projects at Idaho National Engineering Laboratory, Fernald, Oak Ridge Reservation, and Savannah River Site may benefit from the Underground Storage Tank ID.

The Radioisotope Separation and Processing IP focuses on the extraction, isolation, and concentration of radionuclides, particularly transuranics and other long-lived nuclides, to reduce the volume and hazard of radioactive or mixed waste. There will be applications at nearly every DOE site.

The RCRA Component Destruction ID is designed to test technologies that degrade hazardous compounds in situ, contaminated materials after retrieval, and waste processing streams to avoid dealing with wastes containing both radioactive and RCRA components. There will be applications at nearly every DOE site.

The Combustible Waste ID will seek to develop EPA-acceptable thermal and alternative methods for treating wastes containing contaminated paper, cloth, wood, and plastics.

New IDs in planning to support waste retrieval and processing include decontamination and decommissioning (D&D) of metals, D&D of concrete, in situ vitrification, and advanced processing methods.

The D&D of Metals ID and the D&D of Concrete ID are expected to eventually dominate EM functions, particularly in connection with the replacement of several major facilities in the Defense Programs Reconfiguration. The potential volume of waste from D&D exceeds the volume of past DOE wastes.

The In Situ Vitrification ID deals with a promising technology that instantly destroys many hazardous components and immobilizes the remainder in a glass or slag matrix with minimal personnel exposure. Potential applications include cribs, pits, disposal trenches, and underground tanks with or without their contents.

The Advanced Processing ID objective is to develop and test final waste forms for high-level radioactive wastes that may also include hazardous components.

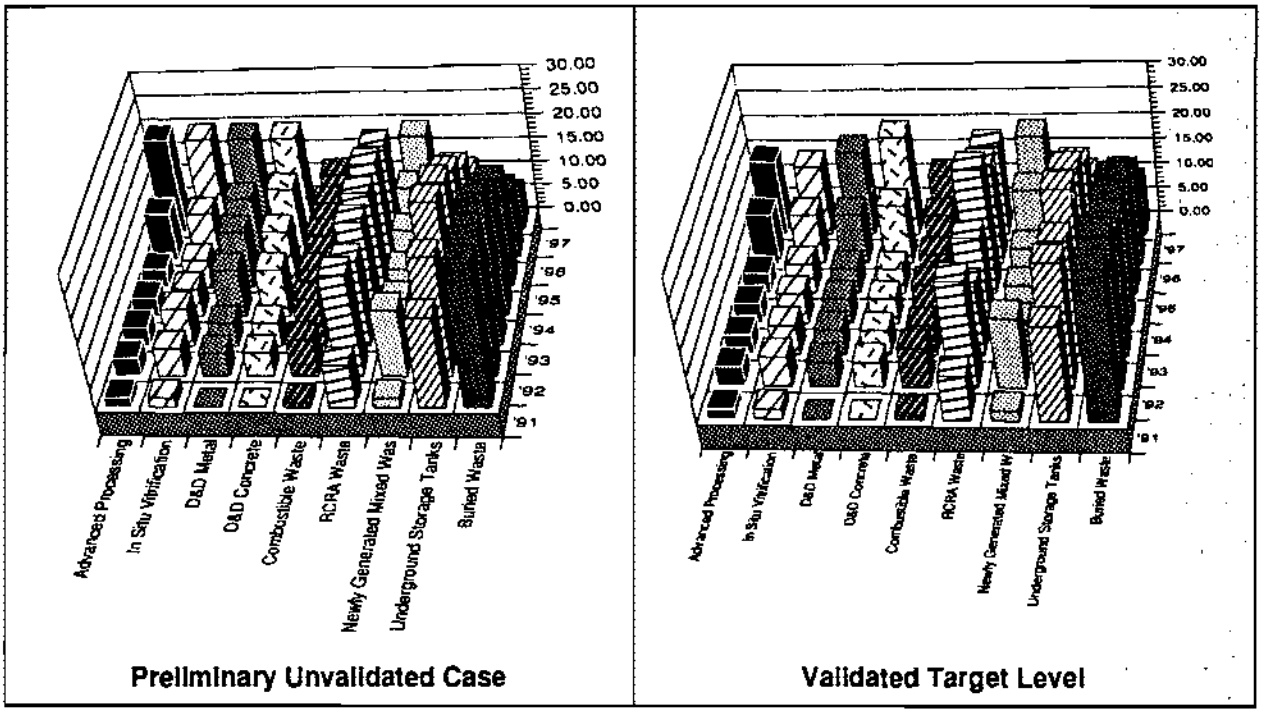
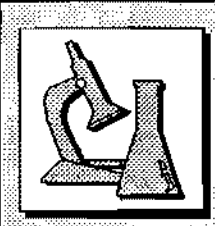


Figure 2.4.6.1.2. Planned funding for Waste Retrieval and Waste Processing IDs is subject to change in response to programmatic requirements. Waste retrieval and waste processing activities support the primary missions of the Environmental Restoration and Waste Operations Programs. Actual funding will depend on fiscal constraints and programmatic requirements. (funding in $ millions)

2.4.6.1.3 APPLICATIONS AREA C: WASTE MINIMIZATION AND WASTE AVOIDANCE



Minimization or elimination of waste generation through process alteration, material substitution, and recycling is always the preferred solution to waste management needs.

DOE has developed a multimedia waste minimization program, driven by the 1984 Hazardous and Solid Waste Amendments to RCRA. This program eliminates or minimizes waste generation at the source and recycles materials as much as possible. In this regard, DOE has entered into a number of Federal Facilities Agreements with milestones that can only be reached by the development and implementation of new technologies. The technology needs are identified by information from process waste assessments being conducted throughout the DOE complex and are expected to provide new or altered processes and equipment and new materials.

Technology needs for waste minimization are being addressed through an Integrated Demonstration (ID) described in the Technology Summaries in Section 3.

The Environmentally Conscious Manufacturing ID addresses production operation needs in four areas: solvent substitution, dry process cleaning, fluxless soldering, and Process Monitoring and Control. The solvent substitution activities are driven by RCRA concerns and international agreements to completely eliminate ozone-depleting halogenated hydrocarbons by the year 2000. Research and development (R&D) goals are to provide alternate environmentally safe solvents. These new solvents will require testing for compatibility with other materials and evaluation of the effects of changes in the production processes. Dry process cleaning, fluxless soldering, and process monitoring and control are other technology needs for which R&D that is presently under way will provide new processes, materials, and equipment to facilitate reaching DOE waste minimization goals. Through a Memorandum of Agreement with the U.S. Air Force and the Boeing Corporation, DOE is seeking materials to replace chlorinated hydrocarbons in manufacturing and cleaning applications. Chlorinated hydrocarbons as a group, because of their abundant use, mobility in the environment, and resistance to degradation and biological/ecological effects, are probably the most important family of chemicals needing pollution control.

The design laboratories and manufacturing facilities entered into a Memorandum of Understanding in 1990 to optimize resource and funding coordination in developing new technologies. The goal is to develop and rapidly implement technology directed toward the top priority waste minimization needs within the weapons production complex. These R&D activities include forming and dry machining techniques for plutonium to eliminate or reduce wastes, monitoring and controlling technologies for

the metal finishing processes, material recovery and reprocessing, and robotics applications in material handling.

The Depleted Uranium Waste Minimization ID at the Oak Ridge Y-12 Plant continues. The goal of this program is to realize a 60 to 80 percent reduction in radioactive waste from nuclear material and weapons manufacture. Recent successes in material fabrications tests indicate that technology advances will be ready for implementation in the near future. These technologies will also be applied in other parts of the complex.

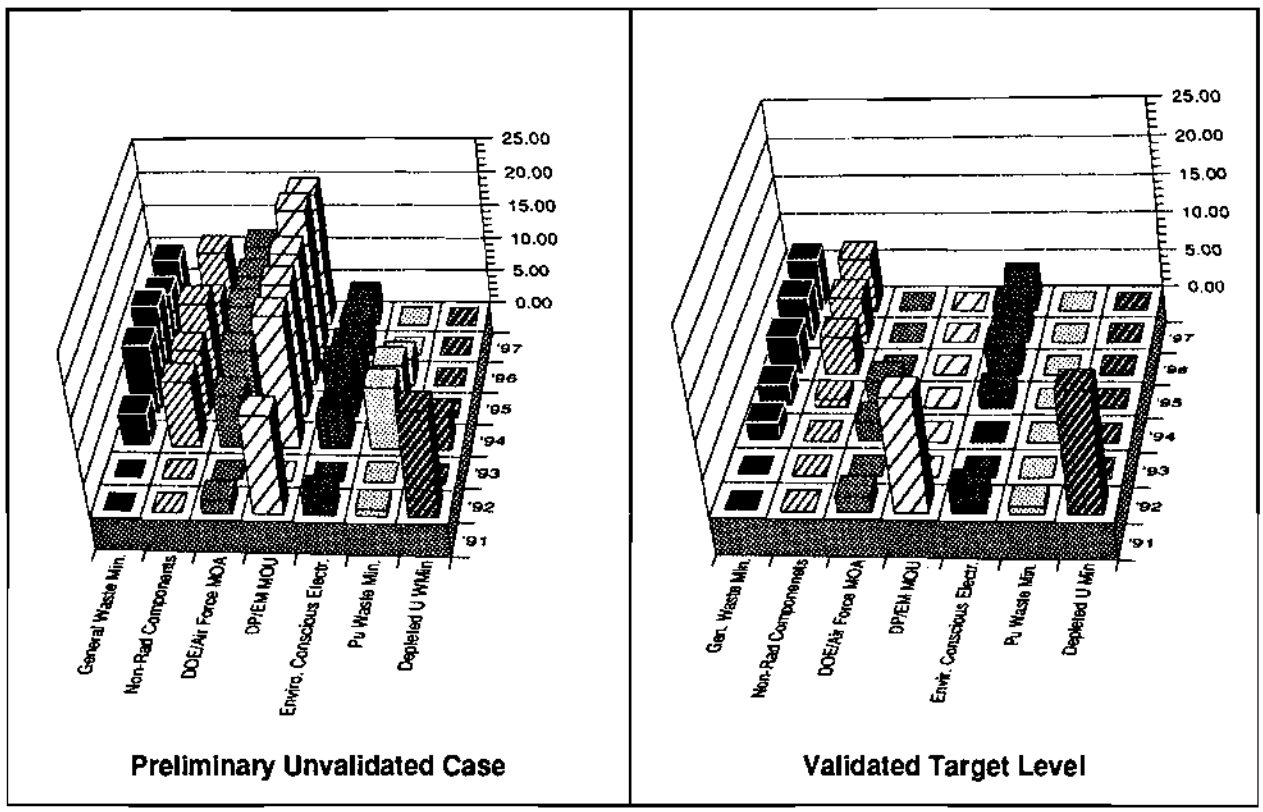


Figure 2.4.6.1.3. Planned funding for Waste Minimization and Waste Avoidance IDs is subject to change in response to programmatic requirements. Waste minimization and waste avoidance activities support DOE production and research. Actual funding will depend on fiscal constraints and programmatic requirements (funding in millions). (DP = Defense Programs)

2.4.6.2 SUPPORTING TECHNOLOGIES PROGRAM

Crosscutting technology development activities in analytical laboratory management, robotics technology development, international technology exchange, and decision support sustain needs in all sectors of Environmental Restoration and Waste Management.

The Supporting Technologies Program involves crosscutting technical efforts that support all of EM and other DOE departmental elements. As depicted in Figure 2.4.6.2, the Supporting Technologies Program includes four elements.

Analytical Laboratory Management involves the development of an EM-wide quality assurance program for sampling and analysis; the development of sufficient laboratory capacity for the analysis of radioactive, hazardous, and mixed waste samples for all EM programs; coordination of EM's analytical support resources; and development of an EM-wide information management system for analytical data. Analytical support resources include facilities, instrumentation, and staff. The analytical program encompasses the activities necessary to ensure that Environmental Restoration and Waste Operations analytical data meet programmatic and regulatory requirements for sensitivity, accuracy, precision, and technical credibility. Implementation of advanced analytical technology, such as new methods for analysis of mixed waste samples, is included.

Robotics Technology Development provides the needed technology to allow the remote characterization and remediation of DOE sites containing radioactive, hazardous, and mixed waste. Robotics technology integrates state-of-the-art computing and sensing technology with manipulator and vehicle systems to provide remote cleanup capabilities, which are faster, safer, and cheaper than alternative approaches. Modular, reusable software and hardware systems reduce the cost of technology development, increase system safety, and facilitate the use of commercially available subsystems to provide an early impact. The robotics technology development program focuses on six functional areas: waste storage tank cleanup, buried waste site cleanup, contaminant characterization and analysis automation, waste minimization, decontamination and decommissioning, and waste handling operations.

International Technology Exchange (ITE) identifies and facilitates the transfer of foreign technologies, which could potentially improve program and operational effectiveness, reduce costs, and save time in implementing EM programs and mission requirements. ITE is establishing and maintaining an aggressive interagency program strategy, based upon collaboration and technology transfer among Federal agencies, industry, academia, and the international community. ITE is developing Environmental Technologies for Remedial Action Data Exchange (EnviroTRADE) information system to provide a

comprehensive worldwide description of Environmental Restoration and Waste Operations technologies, the capability to match the existing technologies with worldwide needs, a cost/benefit screen for foreign technologies, and a framework for maintaining current information on organizations, contacts, and technical experts. Upon successful demonstration, EnviroTRADE will be linked to international-wide area networks such as Environet, an EPA pilot project demonstration, to maximize the user community and data access capabilities.

Decision Support provides the overall framework for strategic and tactical risk-based decision making. This framework ranges from prioritization to program implementation. It also includes a description of the methods for prioritizing Environmental Restoration and Waste Operations technology needs, a risk-based approach for technology selection, and the measurement of the changes in risk as a project moves through the various Research, Development, Demonstration, Testing, and Evaluation (RDDT&E) development phases. Decision support also provides the necessary analytical tools, data bases, and approaches to effect risk-based decision making. This activity includes the identification of the nature and magnitude of human, ecological, and other risks that exist or could develop as a result of the handling, treatment, storage, and disposal of particular wastes; cost and benefit trade-off analyses; regulatory and legal compliance issues; and communication of risk issues and decisions to regulators and the public.

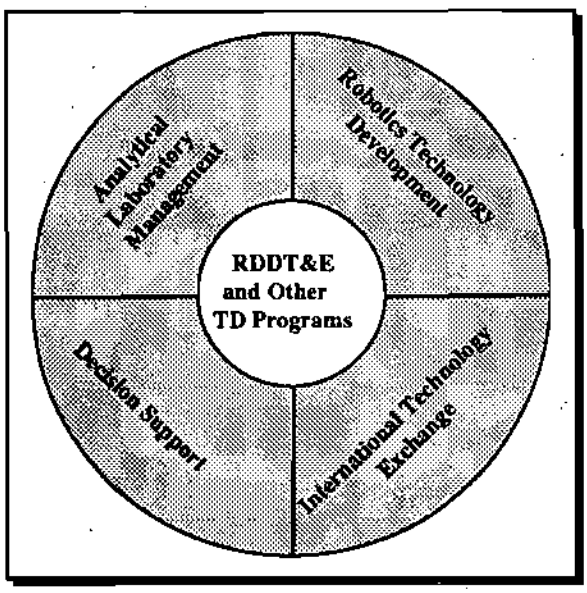


Figure 2.4.6.2. Supporting Technologies Program activities provide crosscutting technologies and support to RDDT&E and other Technology Development programs. (TD = Technology Development)

2.4.6.3.1 HOW TECHNOLOGY INTEGRATION WORKS

The Technology Integration Program (TIP) facilitates the pivotal roles of technology integration, regulatory coordination, and public involvement, which are essential to final technology implementation. Technology integration enhances the infusion (transfer in) of technology from sources outside of DOE, the diffusion (transfer out) of technology developed within DOE, and the exchange of technology within DOE. Regulatory coordination supports Integrated Demonstrations (IDs) through oversight and guidance on regulatory issues. TIP intends to expedite interaction with environmental stakeholders both at the local, site, and national levels through developing appropriate linkages with groups and government agencies.

TIP facilitates and implements technology integration, regulatory coordination, and public involvement, three areas critical to the success of technology development (TD) and application for the Office of Technology Development (OTD). Technology integration is the process by which technology, knowledge, and/or information developed in one organization, in one area, or for one purpose is applied and used in TD programs and then ultimately diffused to other organizations. Regulatory coordination is the process of ensuring that all TD activities are consistent with relevant environmental regulations and that the regulators are actively involved in TD activities. Public involvement includes the DOE stakeholders in Research, Development, Demonstration, Testing, and Evaluation issues.

Technology adaptations are planned with the Defense Program's precision manufacturing initiative on machine tools for EM applications, the development of Cooperative Research and Development Agreements for the EM application of the Office of Nuclear Energy's inorganic membrane technology, and participation in the Office of Conservation and Renewable Energy's innovative concepts waste minimization topic area, along with other collaborations currently in the planning stages. Activities planned for FY 1992 include the South Carolina Summer Institute and the South Carolina and Tennessee Environmental Technology Technical Assistance and Outreach Programs.

A comprehensive assessment of the environmental industry, including waste generators, waste management operators, and waste technology developers and users, including industry technology and economics, will be completed, providing EM and the environmental industry with an invaluable information resource for Environmental Restoration and Waste Management planning and decision making. Industry workshops are planned across the DOE system to address specific programmatic needs such as groundwater and soil cleanup, waste minimization and waste avoidance, and other relevant technology applications to promote industry involvement in IDs and identification of

environmental technologies. To involve the private sector, an EM industrial oversight committee will be established to address EM activities and priorities. In addition to its interaction with the private sector, TIP will support discussions with the EPA policy group on the National Advisory Council for Environmental Policy and Technology and its technology transfer and education activities. TIP has begun to work with the Bureau of Mines and intends to expand this type of interaction to the Department of Commerce and the Department of Defense (DOD) in FY 1992.

Regulatory support for the IDs will be provided by TIP through the work of the OTD regulatory issues group. This group, in close cooperation with field office personnel, will be responsible for developing a regulatory streamlining strategy for IDs. Each ID Coordinator will be asked to nominate a team member responsible for environmental regulatory requirements. These individuals will participate in a workshop with OTD Headquarters staff, EM, and Office of Environment, Safety, and Health personnel. The workshop will develop a clear understanding of the specific roles and responsibilities of field offices and Headquarters concerning regulatory issues and activities.

Specific accomplishments planned in FY 1992 include identifying relevant regional/State and national regulatory issues likely to influence the design and implementation of IDs; developing specific strategies for regulatory streamlining, including issues that need to be addressed at DOE Headquarters, EPA Headquarters, and regional offices; and developing a TD regulatory guidance document.

EM requires that Headquarters and each field office develop a public participation plan as part of the 5-year planning process. TIP will be responsible for working closely with TD staff to develop input into Site-Specific Plans and will take the lead in developing an EM-wide public participation plan. In addition to supporting IDs, TIP will also be responsible for developing national linkages with private-sector groups, universities, and stakeholders to effectively communicate TD's mission and encourage their involvement in IDs and other TD activities. Through this national effort, TIP hopes to become a clearinghouse for new technology and for working with regulators and other stakeholders.

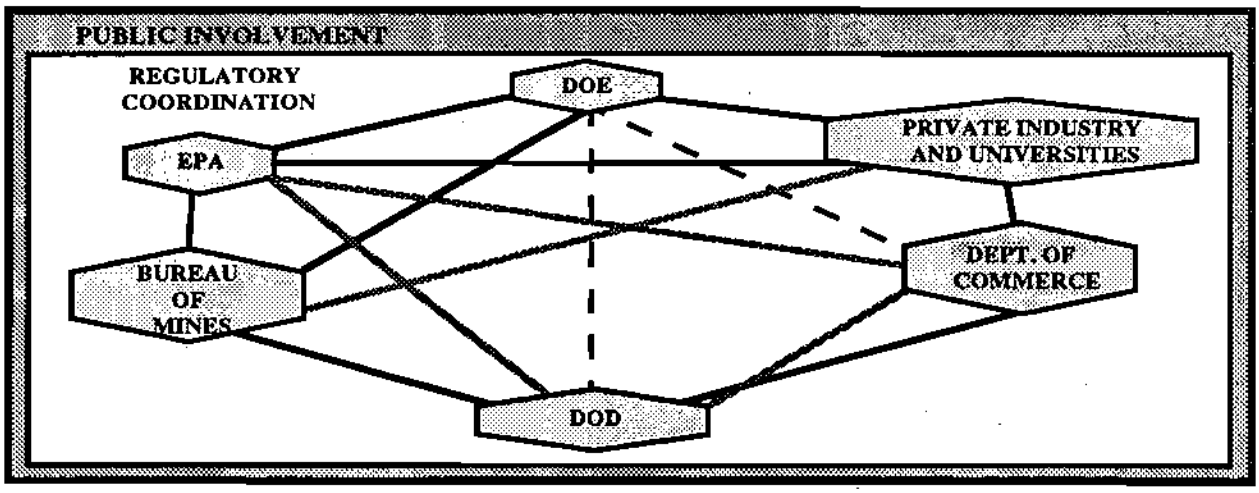


Figure 2.4.6.3.1. TIP, against a background of regulatory coordination and public involvement, communicates with external organizations to develop and implement new technologies.

2.4.6.3.2 HOW THE ENVIRONMENTAL EDUCATION AND DEVELOPMENT PROGRAM WORKS

The mission of the Environmental Education and Development Program is to retain and retrain the current generation and to attract and train the next generation of personnel for developing and implementing solutions to DOE's Environmental Restoration and Waste Operations problems.

DOE's ability to confront its environmental challenges depends on the successful development of human resources as well as technical resources. A scientifically literate public is needed to make well-reasoned decisions about environmental options. A well-educated work force is needed to carry out EM's cleanup and compliance mission.

EM's responsibility in this mission involves training the current work force and educating the future work force through an intense application of science and technology programs from elementary to graduate levels. The long-range goal is to have played the primary role in developing a scientific, technical, and educational infrastructure that will not only achieve the compliance and cleanup goals of DOE's first Five-Year Plan but that can prevent most environmental problems and routinely solve the rest.

The existence of an Environmental Education and Development Program within EM is based on a projected shortfall in appropriately trained and educated human resources. An annual personnel demand/supply report has been implemented in FY 1991 to provide data to EM management for planning, prioritizing, and evaluating its Environmental Education and Development Program.

The Environmental Education and Development Program is composed of three strategic program elements—Pipeline, Current Work Force, and Environmental Literacy.

Pipeline: Pipeline activities address the future work force.

K-12 activities involve science and environmental enrichment programs for students and teachers. These activities are designed to capture young people's interest and stimulate them toward eventual EM careers through hands-on environmental science experience and to increase the number and enhance the qualifications and desire of precollege teachers and career counselors to encourage math, science, and environmental education.

Community College pipeline activities, involving both EM curriculum development and the establishment of linkages with high schools and 4-year institutions, are designed to help these institutions become a national "heartland" for channeling and challenging recent high school graduates toward technician-level EM careers.

Undergraduate pipeline activities, directed toward undergraduate students and

institutions, involve curriculum development, scholarships, and faculty awards. The undergraduate activities are designed to challenge and commit graduates either to pursue advanced degrees for EM-related careers or to join the work force as entry-level engineers and technical supervisors.

Graduate Education pipeline activities, involving curriculum development, fellowships, faculty awards, and EM-related research support, are designed to commit graduate students to supervisory careers in EM-related science and engineering and in applied EM-related research and development.

Current Work Force activities are divided into training and retraining. Training involves increasing the knowledge and enhancing the skills of DOE and contractor personnel currently employed by EM and retaining those people to make their jobs rewarding and meaningful.

Retraining involves (1) reorienting current DOE and contractor personnel to prevent the loss of jobs as DOE sites experience a mission change from production to cleanup and (2) attracting scientists, engineers, technicians, and managers not currently employed by DOE or its contractors and fitting them for work on the EM job. A clear set of guidelines for accreditation of training and retraining courses programs is necessary.

Environmental Literacy is necessary to make well-reasoned personal and public policy decisions about the risks and benefits of a wide range of environmental issues from pollution prevention to hazardous waste disposal. The average citizen must possess at least a basic understanding of science and the environment. Environmental literacy activities are intended generally to help the public make good decisions about environmental issues and specifically to increase the public's awareness of and support for EM's mission and goals.

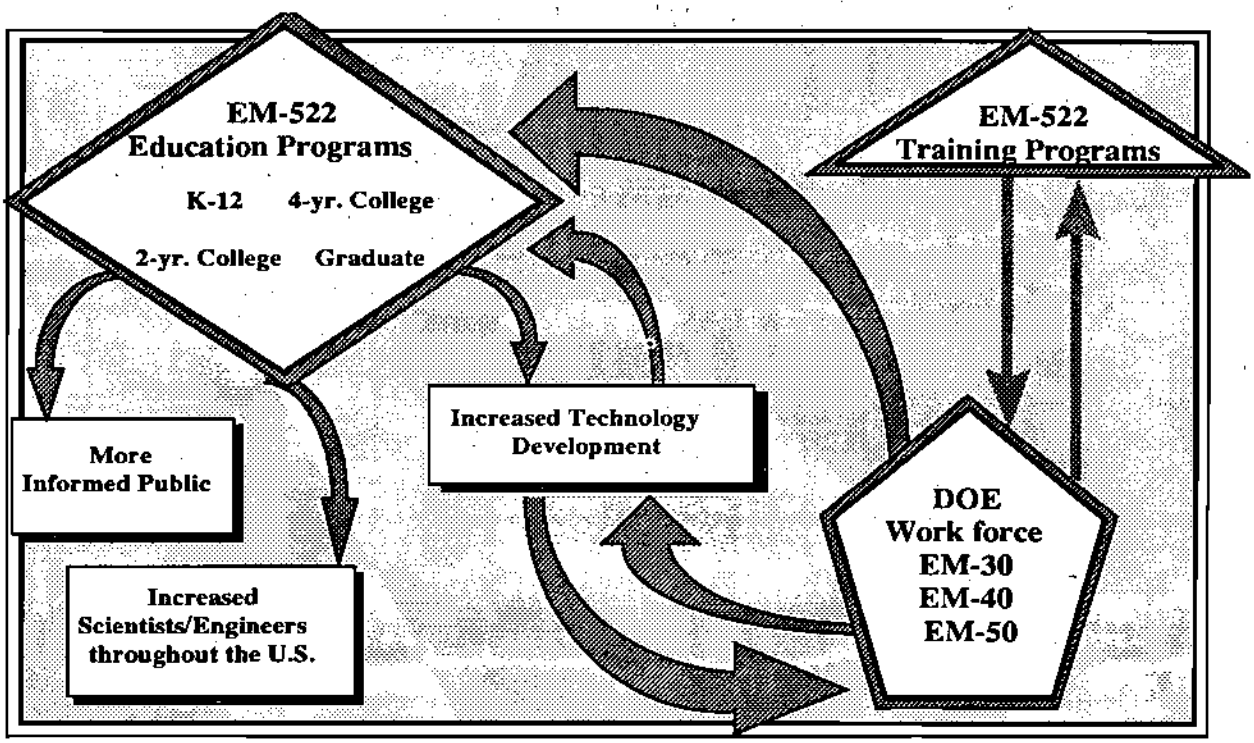


Figure 2.4.6.3.2. EM-522 Environmental Education and Development Programs support the DOE complex, the waste management industry, and the country and society as well.

2.4.7 SUMMARY OF TECHNOLOGY DEVELOPMENT MILESTONES AND FUNDING FOR FY 1993-1997

Office of Technology Development (OTD) programs represent a substantial investment by DOE in future improvements in environmental management.

Funding for OTD is derived from the EM mission to attain the cleanup of DOE sites by the year 2019. Programs have been implemented based on the confidence that less costly and more effective ways of attaining that goal can be achieved. The wisdom of the investment is evident; significant savings were realized in FY 1990 and yields are expected to continue (Section 1.4.6.3).

Projected continuing investments are planned or proposed by DOE. As described in Section 2.4.6.1 of this document, these funds will be devoted to four major programs: (1) Research, Development, Demonstration, Testing, and Evaluation (RDDT&E), including Applications areas for Groundwater and Soils Cleanup (GWS), Waste Retrieval and Processing (WRP), Waste Minimization and Avoidance (WMA), and Innovative Technology; (2) Supporting Technologies, including analytical laboratory management, robotics, international technology exchange, and decision support; (3) Technology Integration and Environmental Education Development; and (4) Transportation Management. Funding plans for the first three of these are depicted in Table 2.4.7 and Figure 2.4.7 and for the fourth in Section 2.5.1.8.

Other categories of expenditure shown in Figure 2.4.7 include Program Support and Program Direction to enable effective management from Headquarters and in the field. A construction program is also displayed, showing the construction of the Environmental and Molecular Sciences Laboratory at Hanford.

Goals and objectives for OTD follow.

FY 1991:

- Bring four Integrated Demonstrations (IDs) to full operational status, one each in GWS and WRP and two in WMA.
- Initiate four Integrated Programs (IPs), three IPs in GWS and one IP in WRP.
- Initiate planning for two IDs in GWS and five IDs in WRP and complete planning for one ID in WMA.
- Implement robotics programs in five technology areas with demonstrations.
- Transfer solvent substitution technology to Defense Programs sites.
- Continue the two pilot partnerships in New Mexico and South Carolina.
- Expand community college initiatives for technicians.
- Form Historically Black Colleges and Universities/Minority Institutions partnership.

FY 1992:

- Maintain five IDs at full operation status, four in GWS and one in WRP.
- Initiate five IDs, four in GWS, and one in WRP.

- Initiate planning for two decontamination and decommissioning IDs in WRP.
- Continue ongoing academic partnerships.
- Increase academic partnerships by as many as four.
- Expand IPs for Radioisotope Separation and Processing and RCRA.

FY 1993-1997:

- Emerge as the international leader in technology development for EM.
- Continue to change the DOE and national laboratory culture to foster significant cooperation and teaming on RDDT&E among the national laboratories, industry, and universities.
- Make significant contributions to the enhancement of education in science and technology.
- Effect expansion of the talent pool for site cleanup and waste management.
- Significantly accelerate the development and deployment of the next generation of technologies needed by EM.

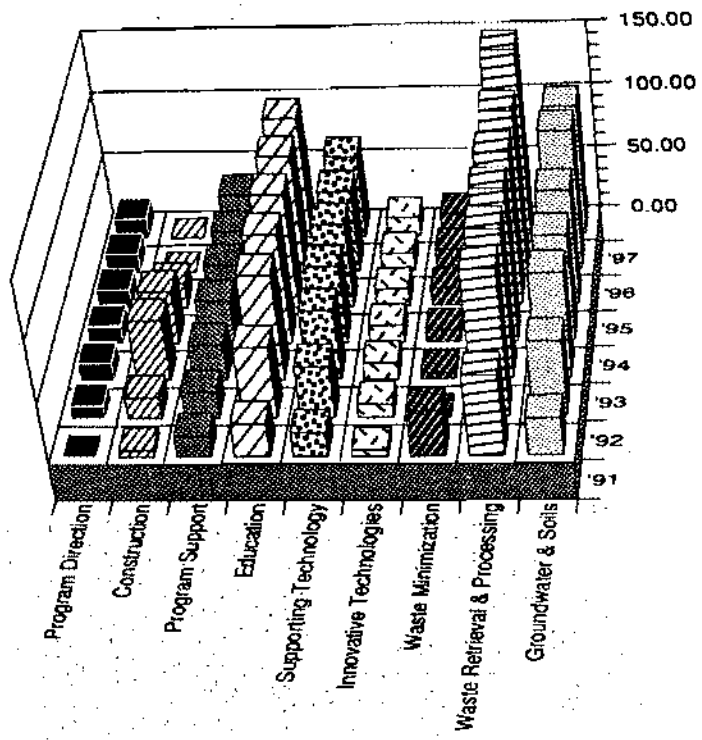
Table 2.4.7 Funding Plans for RDDT&E, Supporting Technologies, and Technology Integration and Environmental Education Development (Actual funding for FY 1992-1997 is subject to change based on fiscal constraints and programmatic requirements)

PRELIMINARY UNVALIDATED CASE ($ Millions)

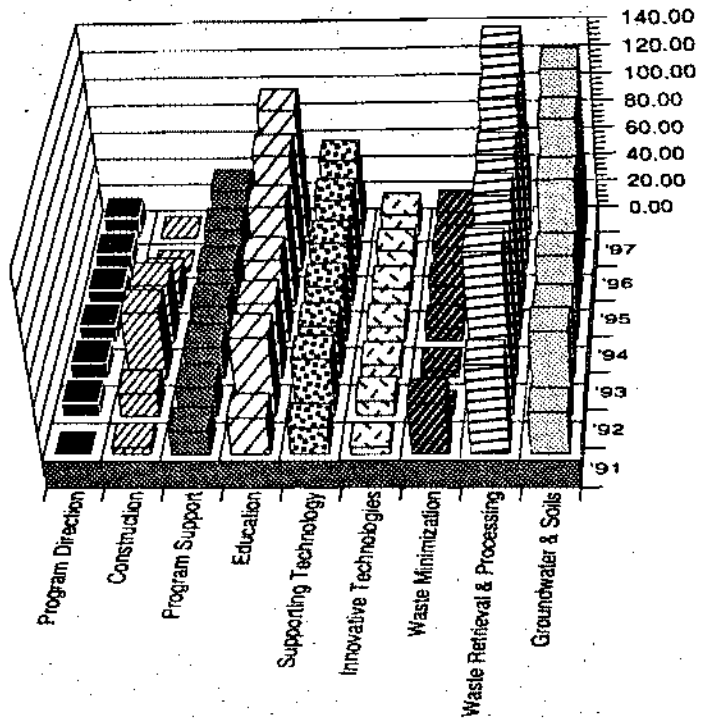
Title	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
Groundwater and Soils	32.8	58.8	85.1	85.6	92.0	110.0	103.0
Waste Retrieval & Processing	65.0	118.4	120.0	123.0	123.0	128.0	149.0
Waste Minimization & Avoidance	37.0	0.0	62.5	63.0	66.4	59.3	57.0
Innovative Technologies	10.5	5.3	13.5	14.0	14.5	14.9	15.4
Supporting Technology	24.5	37.0	57.0	62.9	68.0	66.0	66.1
Education	44.0	40.8	85.5	88.7	91.7	94.5	97.5
Program Support	17.0	21.4	29.5	35.0	35.0	34.0	35.5
Construction	5.2	17.1	49.6	43.2	20.1	0.0	0.0
Program Direction	0.0	10.6	15.0	15.6	16.1	16.6	17.1
Technology Development Total (Excluding Transportation)	236.0	309.4	517.7	531.0	528.8	524.3	540.7

VALIDATED TARGET LEVEL ($ Millions)

Title	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
Groundwater and Soils	32.8	58.8	51.1	62.5	92.0	110.8	122.5
Waste Retrieval & Processing	65.0	118.4	95.0	106.2	110.3	125.0	138.0
Waste Minimization & Avoidance	37.0	0.0	5.0	9.5	14.0	17.0	18.0
Innovative Technologies	10.5	5.3	9.5	10.8	12.7	14.6	16.1
Supporting Technology	24.5	37.0	38.7	41.2	47.0	53.0	57.1
Education	44.0	40.8	55.6	61.1	74.1	86.5	95.2
Program Support	17.0	21.4	23.5	27.0	28.3	31.6	35.5
Construction	5.2	17.1	49.6	43.2	20.1	0.0	0.0
Program Direction	0.0	10.6	12.3	12.8	13.2	14.4	15.8
Technology Development Total (Excluding Transportation)	236.0	309.4	340.3	374.3	411.7	452.9	498.2



Preliminary Unvalidated Case

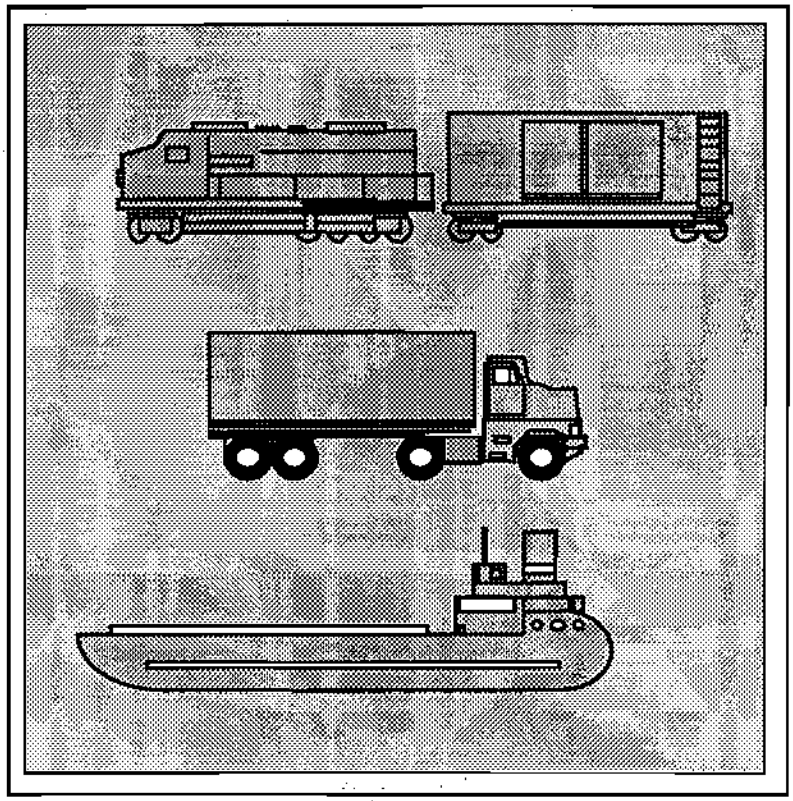


Validated Target Level

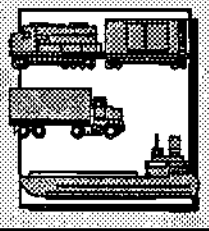
Figure 2.4.7. Planned funding for Technology Development for FY 1993-1997 demonstrates DOE's continuing confidence in the worthiness of investment in the future. Actual funding is subject to change based on fiscal constraints and programmatic requirements (funding in millions).

2.5

Transportation



2.5.1 TRANSPORTATION PROGRAM MISSION AND PROGRAM MANDATES



Transportation is a vital component of all DOE programs.

The Transportation Management Program (EM-50.1), located within the Office of Technology Development, is responsible for coordinating all of DOE's current unclassified transportation.

To support DOE's shipping activities, EM-50.1 develops policies that direct nationwide shipping; trains employees to ensure transport procedures comply with applicable Federal, Tribal, State, and local regulations; develops computerized systems to make operations more efficient and to document activities; develops and tests new materials and equipment, including the packages in which radioactive materials are transported; and conducts programs to foster the productive exchange of information with the public (Figure 2.5.1).

Most of the 350,000 shipments that DOE makes each year are routine transports of construction material, industrial products, coal, and machinery to support its programs. Approximately 30,000 shipments, however, are hazardous materials, and about 15,000 are radioactive shipments. It is the latter group, radioactive transport, that generates the majority of public concern.

To ensure public health and safety during its transportation activities, DOE is using a multibarrier system of protection. First and foremost among these measures is the careful selection of packages for hazardous materials shipments. For example, spent nuclear fuel, the fuel that comes out of a nuclear reactor must be shipped in a Type B package. These Type B packages are of various shapes and sizes yet must meet high standards for containment and shielding. Shielding is the prevention of radiation from penetrating through the walls of the package. These standards are developed by international experts through years of experiments and testing. In over 40 years of shipping in Type B packages, DOE has never experienced a package failure. In fact, no radioactive material shipment has ever resulted in a death, serious injury, or significant impact to the environment as a result of the radioactive nature of the cargo.

To reinforce the safety provided by the package design, DOE carefully prepares the package, inspects it before shipment, and ensures that it is properly marked and labeled and the shipping papers are in order. Highway transporting vehicles must be placarded on all four sides as to shipment contents. Finally, only the most qualified carriers are selected to ship DOE radioactive materials. To ensure this, DOE has a Motor Carrier Evaluation Program that evaluates carriers' overall records in areas such as safety driver training and compliance with Federal regulations for transporting hazardous materials.

DOE has implemented a comprehensive training program to ensure its operators are well trained. DOE prides itself on its safety record and is continually looking for strategies and techniques to maintain and improve it.

Despite its best efforts, however, DOE knows accidents will occur and involve its shipments. DOE is part of a national system of emergency preparedness that will safely handle any transportation accident to protect both the public and the environment. The primary responsibility for responding to an accident lies with the State and local officials. Should the capabilities of these authorities be exceeded, DOE can be called in to assist in monitoring and assessing the emergency. If necessary, comprehensive response can also be marshalled from other Federal agencies.

The ultimate DOE goal is not only to keep the public safe but also to make the public feel safe. In pursuit of this goal, DOE has found that the most successful path to public confidence is public involvement in DOE programs. Over the past several years, through cooperative agreements, workshops, and meetings, DOE has provided opportunities for exchange of information. DOE wants to keep the public informed as well as to remain available for general questions, concerns, and suggestions. The material in the following sections details the EM-50.1 program that fosters safe, efficient, and publicly acceptable transportation of DOE materials.

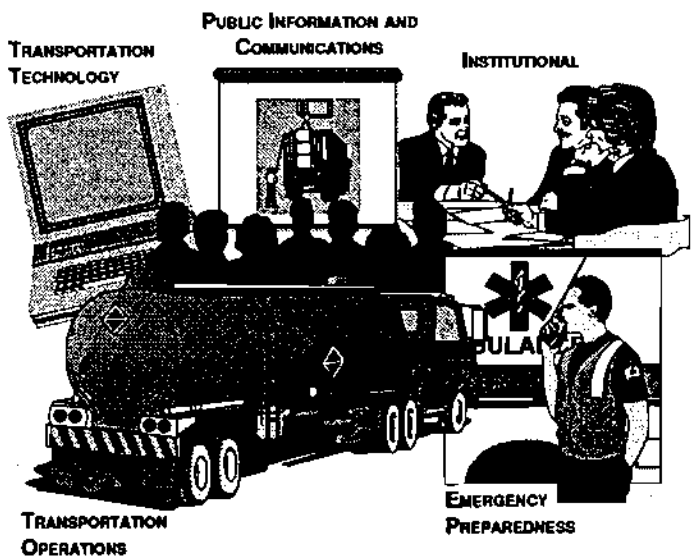
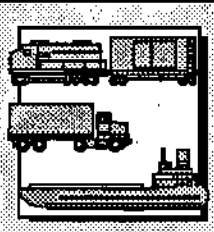


Figure 2.5.1. The Transportation Management Program establishes policy and provides program guidance to ensure DOE transportation is accomplished safely, securely, economically, and efficiently.

2.5.1.1 SCOPE AND ACCOMPLISHMENTS OF THE TRANSPORTATION TECHNOLOGY DEVELOPMENT PROGRAM



New developments and continuing improvements in transportation and packaging systems provide the basis for efficient, safe transportation that meets current and future DOE needs.

The Transportation Technology Development (TTD) Program is responsible for coordinating DOE packaging research and development activities and for developing innovative technology to solve DOE transportation and packaging problems. This program is also responsible for technical support in packaging certification and regulatory issues. The TTD Program includes engineering analysis; testing; advanced technology development; certification support; regulatory support, standards development, and technology transfer; safety and systems assessment; and packaging development.

Engineering Analysis: Predicting behavior of packagings under transport conditions is essential in the design and development of hazardous materials packages. Analytical codes or computer programs are created to aid in the predictions by simulating the conditions the packaging may encounter. Regulatory acceptance of analytical codes is based on well-established engineering practices. These codes are timely, cost-effective, and an acceptable alternative to expensive and often impractical full-scale testing.

Testing: The TTD Program operates and maintains testing facilities for conducting tests on radioactive materials packagings. State-of-the-art measurement and instrumentation techniques are continuously being developed and implemented in the field. Planned improvements include upgrades of lift and impact target capabilities for packages weighing up to 100 tons.

Advanced Technology Development: Investigation and development of new systems and components and the characterization of materials such as ferritic steels and ductile cast iron are major activities.

Certification Support: To facilitate the timely certification of DOE packaging, the base technology program supports the certification and recertification of radioactive material packaging through (1) reviewing Safety Analysis Reports for Packaging, (2) developing and applying analytical methods, and (3) addressing technological issues.

Regulatory Support, Standards Development, and Technology Transfer: This area (1) addresses the technical issues that concern U.S. regulators and (2) exchanges information and provides support to U.S. and international organizations by developing technical data and providing comments on proposed national and international regulations and standards.

Safety and Systems Assessment: This facet includes analyzing DOE transportation

systems for radiological and nonradiological risks and routing of shipments in addition to environmental, economic, and other logistical considerations.

To assist in these analyses, the TTD Program has created computer models such as an interactive computer network called TRANSNET. Through TRANSNET, other users, including State agencies and industry groups, are able to access the transportation models. A major activity in this area is the technical support for risk assessment documentation, Environmental Assessments, and the Environmental Impact Statement.

Packaging Development: New concepts for nuclear materials transportation packages are developed, reviewed, and evaluated.

The following are examples of the accomplishments of the TTD Program.

- Packaging Development: Technology development has played a major role in nuclear materials package development projects for DOE. Examples of this include work funded by EM and other DOE elements including TRUPACT full-scale testing and contents analysis, remote-handled transuranic waste cask evaluations, vitrified (solidified) high-level waste cask evaluation and testing, Three Mile Island shipping cask testing, West Valley storage/transport cask structural evaluation and scale-model testing, Department of Transportation 6M specification package evaluation, plutonium air transport testing, Office of Civilian Radioactive Waste Management cask systems technology support, and support for the Navy M-140 cask evaluation and testing.
- Packaging Performance Assessment: The TTD Program has developed computer codes for structural and thermal analysis. Recent examples of structural analysis code development include PRONTO-2D and PRONTO-3D. These codes are capable of analyzing large deformation dynamic events in two and three dimensions for impact and puncture analyses of radioactive material packagings. Packaging development programs are assisted by scale-model and full-scale structural testing facilities developed by the TTD Program. International code benchmarking of transportation analysis codes ensures accuracy of the results.
- Technology Development: The TTD Program has played a key role in packaging technology. Development of cost-effective material subsystems, including structural materials, seals (Figure 2.5.1.1a), impact limiters, etc., is under way. Improvements in system efficiency such as establishing automated cask handling methods have been demonstrated. A mobile instrumentation data acquisition system (MIDAS) has been developed to provide state-of-the-art data acquisition for package testing (Figure 2.5.1.1b). Both national and international use of the mobile instrumentation system has been performed. The ductile cast iron program will transfer technology to other organizations.
- Risk Assessment: A new version of the RADTRAN risk analysis computer code (RADTRAN IV) has been produced and incorporated into TRANSNET.
- Standards, Regulatory, and Certification Support: The support for the International Atomic Energy Agency (IAEA) includes providing technical assistance to the Standing Advisory Group for Radioactive Materials; supporting the development of risk (INTERTRAN, which is based on RADTRAN) and systems analysis computer codes; and providing data from

crush test experiments for new regulations. The TTD Program also participates in the development of American National Standards Institute, American Society for Mechanical Engineers, and the American Society of Testing Materials standards. International code benchmarking was performed in support of the Organization of Economic Cooperative Development. The TTD Program is taking the lead internationally in developing brittle fracture acceptance criteria through the IAEA.

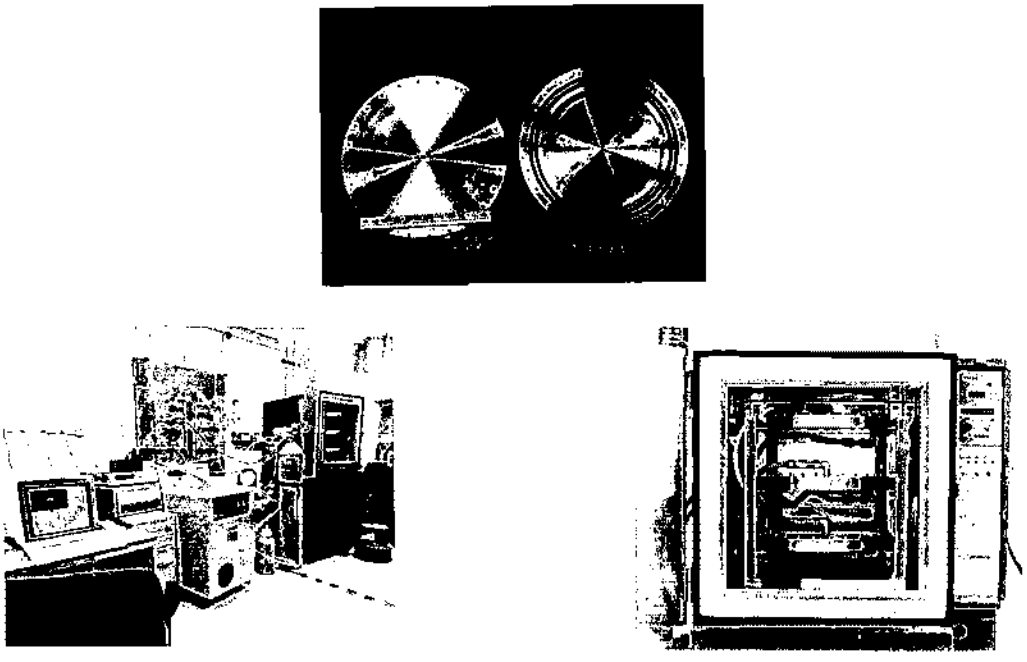


Figure 2.5.1.1a. The Seal Technology Program evaluates different materials and designs for use in radioactive material packagings.

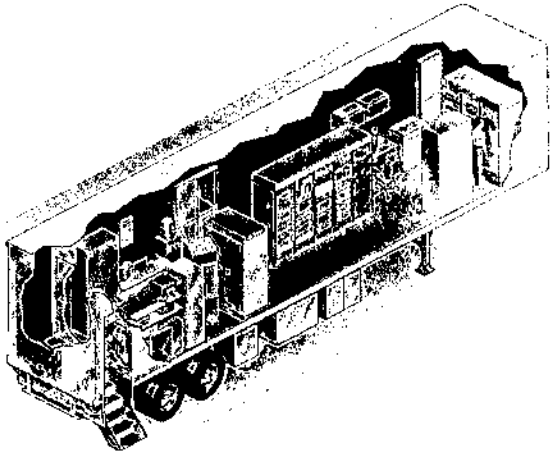


Figure 2.5.1.1b. MIDAS is a self-contained data acquisition facility in a 13.4-m (44-ft.) trailer, which is equipped with structural and thermal data acquisition systems as well as other experiments requiring onsite data acquisition.

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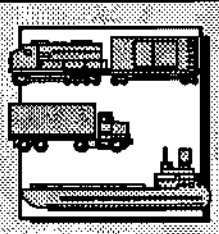
2.5.1.2 FUTURE TRANSPORTATION TECHNOLOGY DEVELOPMENT EFFORTS IN ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT



The identification of specific Environmental Restoration and Waste Management transportation and packaging problems and requirements is a priority activity in the Technology Development Program. This activity ensures that appropriate containers and related transportation systems are in place to support site cleanup and waste management activities.

Current actions to clean up the Nation's defense facilities require an assessment of packaging needs for the weapons complex. Because there will be a need for the transportation of materials that have not historically been moved under production conditions, transportation package development programs will have to be identified to meet these unique needs. This activity is one part of the larger Transportation Assessment and Integration Study (TRAIN, as described in Section 2.5.1.8).

The intent of the first phase of the study is to plan for the required research and development (R&D) functions. The approach used is to define the unique program elements and tasks (Figure 2.5.1.2). Study guidelines and topics will be established, and a panel consisting of DOE, national laboratory, and industry representatives will review the plans and procedures. Coordination with other TRAIN elements, especially Packaging and Transportation Needs in the 1990s, will be done. New technology requirements will be based upon TRAIN recommendations.

The basic elements of the program consist of (1) data base evaluations and site verifications, (2) systems engineering, (3) risk assessment and regulatory support, (4) base technology development, (5) packaging component design concepts, and (6) package design.

The approach to performing data base evaluations and site verifications is to use existing data from which programmatic assessments, including R&D requirements, can be formulated. The existing data bases will be organized and interpreted. Site visits will be conducted to verify data and to develop an understanding of site-specific needs. Once the site visits are completed, the data will be assimilated to establish concepts within budgetary and time constraints. An initial sort will be made to establish a reasonable number of the most pressing transportation requirements. These results will be correlated with other related transportation activities.

The purpose of systems engineering is to systematically evaluate the methods of achieving transportation requirements for a reasonable number of applications, including hazardous and mixed waste remediation efforts. The tasks include instituting methods and economic analyses to integrate transportation effectively into the remediation effort. Transportation options will be defined for specific cases. EM is working cooperatively with the civilian radioactive waste staff and others on the evaluation of dual-purpose casks (i.e., casks

for storage and transport) for effectiveness of interim storage applications. Another example is the need to establish effective transport verification methods such as radio-frequency identification of transport shipments. The risk assessment and regulatory support activity will provide a basis for defining the requirements for onsite and offsite transport of hazardous and mixed wastes. The initial basis will be the requirements of the Nuclear Regulatory Commission, EPA, the Department of Transportation, and the applicable DOE Orders and guidelines, modified to account for onsite controls. The RADTRAN risk analysis computer code and TRANSNET will be used to support applicable environmental assessments.

Base technology development (i.e., technology underlying the design, development, and testing of nuclear materials packaging systems and operations) is required to extend the present transportation technology base so that the effects of various hazardous substances on packaging components can be evaluated, methods for safe and effective transportation can be designed, and new and improved concepts can be evaluated. Tasks include components analysis (seals, liners, etc.); materials evaluations; structural, thermal, and chemical analyses; identification of standards and regulations; integration of robotics and advanced handling concepts; testing; and evaluation of decontamination methods for packagings.

Generic designs of new packaging concepts will be evaluated for various hazardous and mixed waste applications. Concurrent development of preliminary packaging concepts is planned to provide a vehicle for demonstrating new technology to evaluate improvements. Concepts to be evaluated may include the design of impact limiter and thermal barriers, sample and fill ports and chemically resistant seals and coatings. The intent is to develop modular design concepts for different applications. These design concepts will enhance user throughput, as low as reasonably achievable considerations, and decontamination methods. Electronic monitoring systems will be evaluated to provide direct evaluation of package conditions.

After the total needs assessment has been completed, the final issue to be addressed is package design for specific applications. Concepts include site-specific applications and integrated designs using modular and generic concepts.

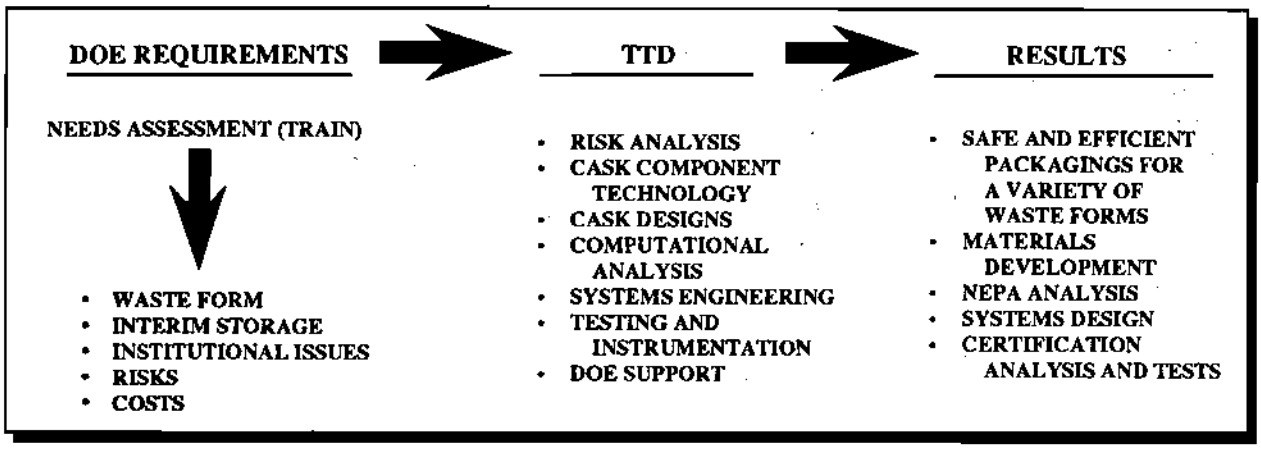
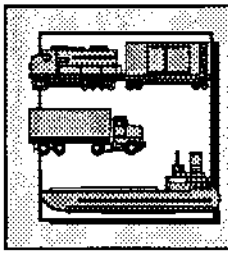


Figure 2.5.1.2. Future Transportation Technology Development efforts will be identified through a needs assessment, which will ensure that appropriate transportation systems are in place to support EM site cleanup and waste management activities. (NEPA = National Environmental Policy Act, TTD = Transportation Technology Development)

2.5.1.3 SCOPE AND ACCOMPLISHMENTS OF THE TRANSPORTATION LOGISTICS PROGRAM



Packaging and transportation operations, featuring well-trained people, strict attention to regulatory requirements, state-of-the-art packaging, and transportation and data systems, are managed through the Transportation Logistics Program.

The Transportation Logistics Program is responsible for ensuring the safe, economical, and efficient packaging and transportation of DOE materials, including hazardous materials, substances, and wastes. In accomplishing this objective, DOE uses a wide range of activities to ensure appropriate regulatory compliance, availability of packagings to meet shipment requirements, and economies of these functions (Figure 2.5.1.3). Included in these activities are:

- DOE-wide negotiations for commercial carrier rates and services;
- sponsorship of accredited training for DOE and contractor staff in the uniform understanding and application of Federal, State, and local regulations affecting the packaging and transportation;
- evaluation of commercial carriers for authorization to provide transportation services to DOE;
- development of automated transportation capabilities for application on a DOE-wide basis; and
- development of policies and procedures for safe, economical, and efficient transportation.

DOE's packaging and transportation program has a very lengthy record of providing for public and environmental safety in its activities. This safety record results from rigorous attention to compliance with applicable regulations and continued cooperation with carriers and States to ensure that DOE packaging and transportation are correct.

Accomplishments: Recent Transportation Logistics Program accomplishments include:

- development of DOE policy for the onsite packaging and transportation of hazardous materials, substances, and wastes;
- development of a new training course for personnel involved in the packaging of hazardous wastes;
- evaluation of several potential software packages for the DOE Automated Transportation Management System and the selection of two packages for site-specific test and demonstration;
- development of a DOE policy for inspection of commercial motor vehicles to ensure appropriate vehicles for the cargo;
- development of a motor carrier evaluation and selection program to ensure that only qualified carriers are utilized;
- negotiation to provide discounted rates with less-than-truckload carriers for DOE-wide transportation services;
- development of guidance for DOE-wide implementation of new international and Federal regulations for performance-oriented packagings for hazardous materials; and

- provision for training in hazardous materials packaging and transportation regulations to approximately 1,500 people per year.

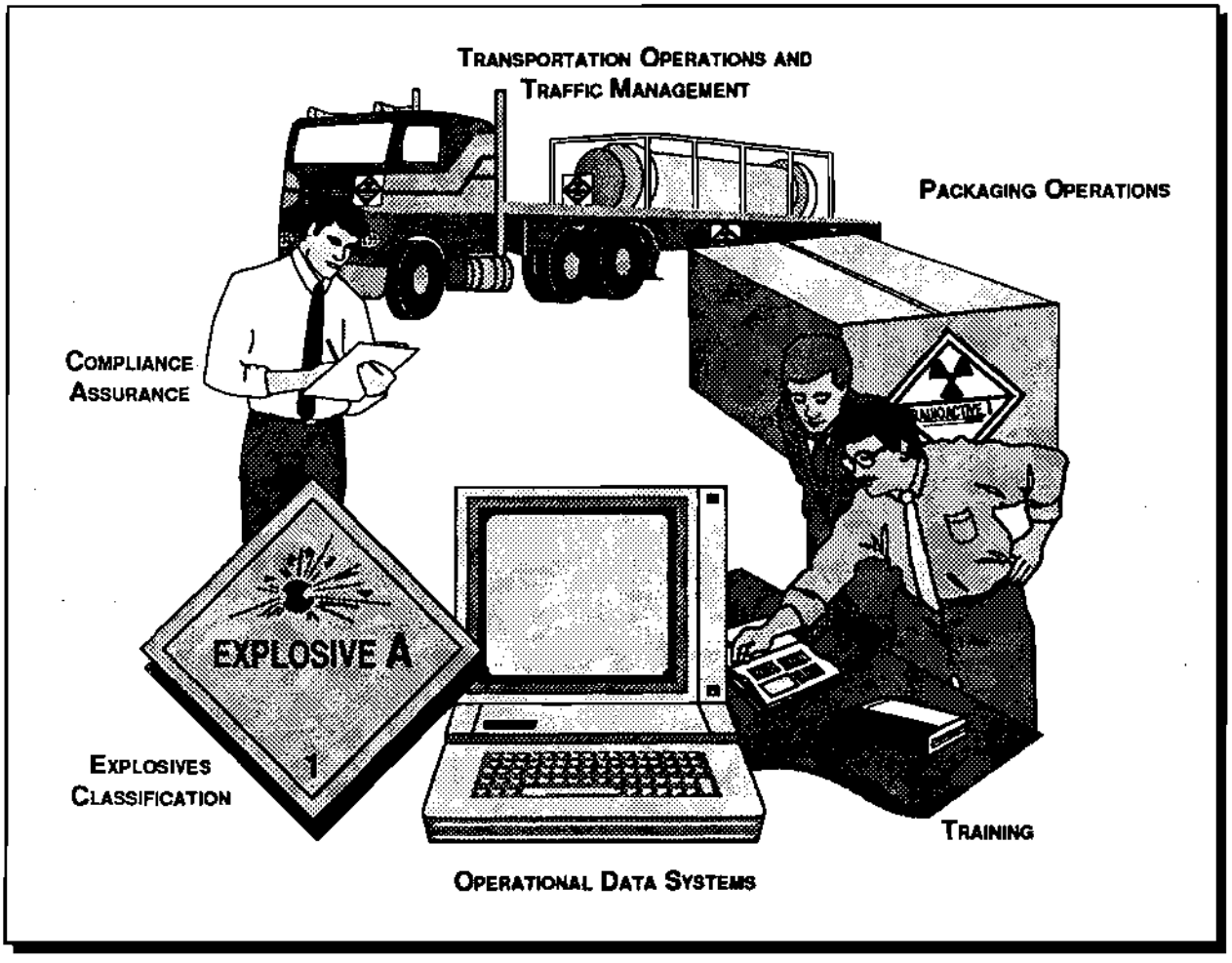
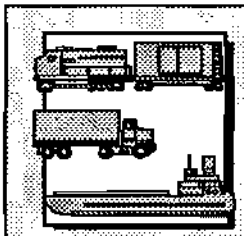


Figure 2.5.1.3. The Transportation Logistics Program supports day-to-day shipping through six main activities.

2.5.1.4 TRANSPORTATION LOGISTICS: REGULATORY COMPLIANCE PROGRAM



Regulatory Compliance initiatives ensure that DOE packaging and transportation activities are in full compliance with applicable regulations.

DOE transportation activities are regulated, just as commercial carriers are regulated. As the potential danger of the commodity transported increases, the regulations governing its packaging and shipping also increase.

The Regulatory Compliance Program ensures that the packaging and transportation activities of DOE are executed in full compliance with applicable international, Federal (Figure 2.5.1.4), State, and local laws, rules, and regulations and with DOE policies and procedures. DOE employs several activities to accomplish this objective:

- developing and sponsoring multifaceted training programs (hazardous materials, regulatory compliance, vehicle inspection, driver, etc.);
- performing oversight and operational appraisals and reviews to verify compliance and implementation of operational requirements; and
- evaluating proposed international, Federal, and State laws and regulations for determining the impact of DOE programmatic activities and implementation requirements.

DOE's enviable safety record in the packaging and transportation of hazardous materials, substances, and wastes, particularly radioactive materials, has been maintained through dedication to regulatory compliance. The Regulatory Compliance Program, in participation with international and national organizations, develops proposed regulatory changes to enhance the safety of packaging and transportation.

Accomplishments: The Regulatory Compliance Program accomplishments include:

- developing a guidance document for DOE-wide implementation of the Department of Transportation rulemaking HM-181 that adopts international standards for performance-oriented packagings for hazardous materials,
- conducting transportation appraisals/ reviews at 10 DOE sites during FY 1990 and FY 1991,
- implementing training programs at DOE and contractor sites for execution of new vehicle inspection policy, and
- providing hazardous materials regulations compliance training for more than 3,000 individuals.

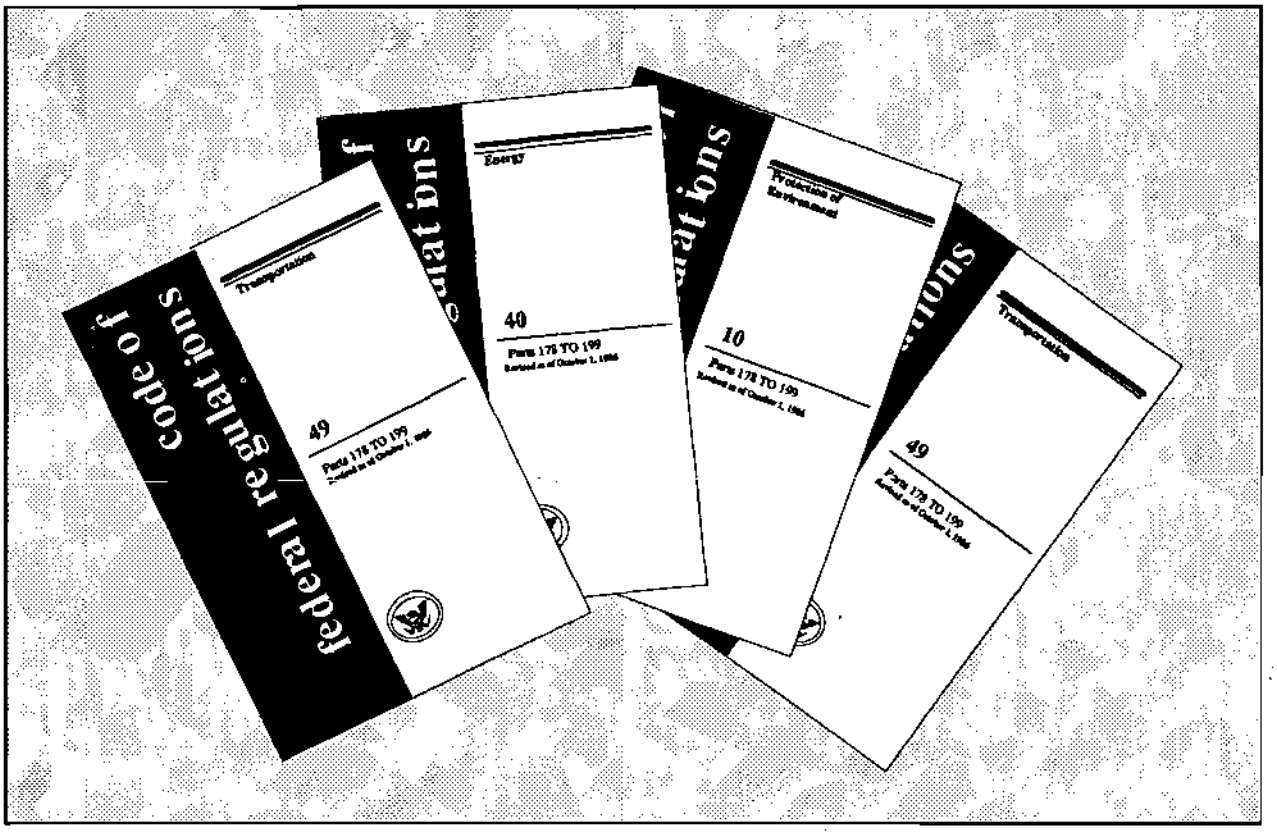
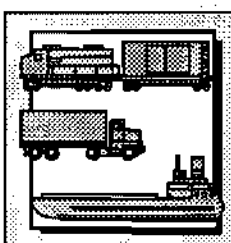


Figure 2.5.1.4. Federal regulations are the basis for safe transport of radioactive materials.

2.5.1.5 SCOPE AND ACCOMPLISHMENTS OF THE EMERGENCY PREPAREDNESS PROGRAM



The Transportation Emergency Preparedness Program (TEPP) has been implemented to enhance internal preparedness for transportation emergencies and to instill public confidence in DOE's response capabilities through coordinated State, Tribal, and local government preparedness initiatives.

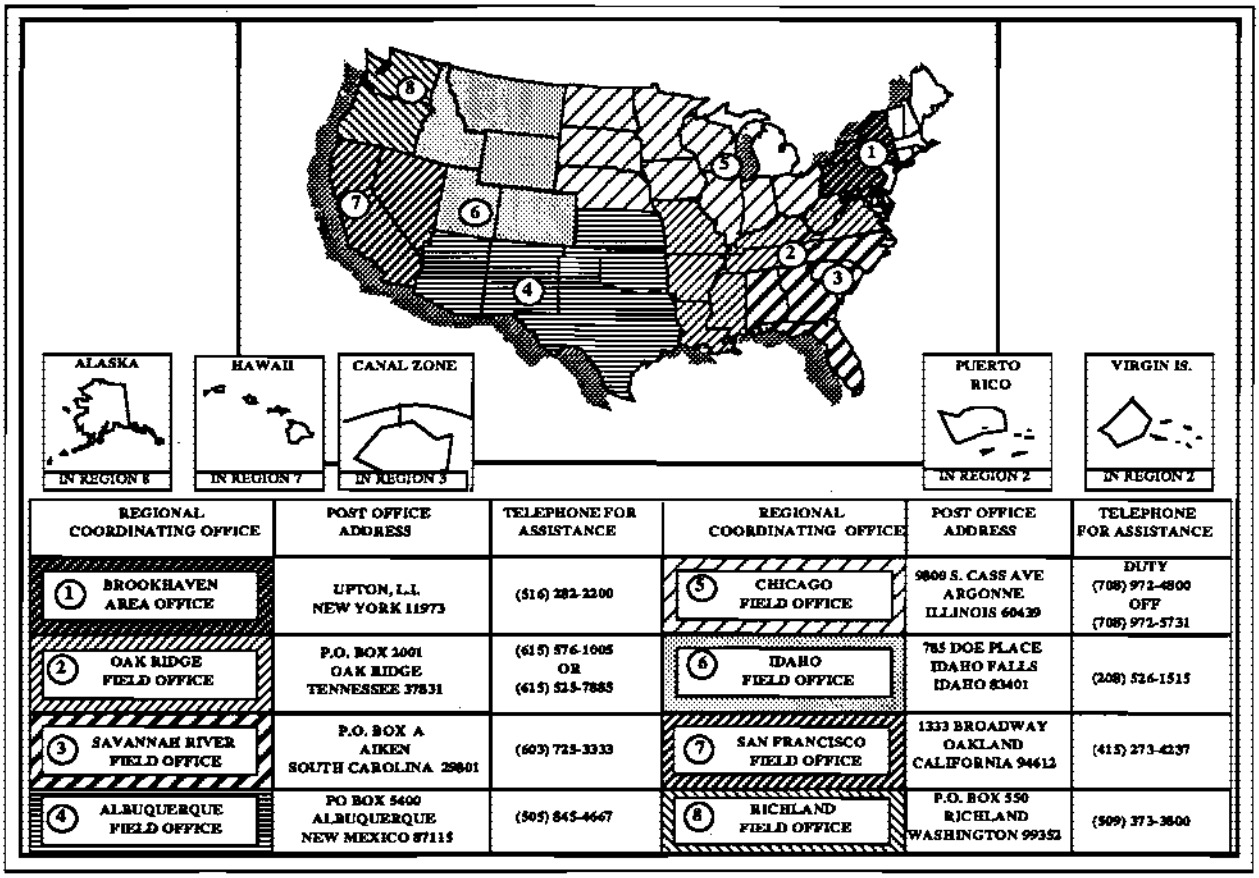
For more than 40 years, DOE and its predecessors have shipped radioactive materials throughout the United States. The transportation of these materials, including wastes, has exhibited an exemplary safety record. DOE does recognize that accidents do occur and is taking steps to improve internal and civil government capabilities for coordinated response actions. State, Tribal, and local officials are the first to respond, should an accident involving radioactive materials occur. A comprehensive program of DOE and other Federal agency backup response is available upon request.

TEPP: The Federal Radiological Emergency Response Plan tasks the DOE to provide monitoring and assessment assistance if radioactive materials are involved in an accident. In fulfilling this responsibility, DOE has an active network of eight regional coordinating offices across the United States and its territories to provide radiological assistance to civil governments (Figure 2.5.1.5). To complement this network and bring focus to transportation emergencies, EM has initiated a nonweapons-related TEPP. Through TEPP, EM interacts closely with the regional coordinating offices to provide assistance in transportation emergencies, ranging from critical information by telephone to actual response by trained personnel with specialized equipment. During the past year, several initiatives were undertaken to provide for future TEPP growth. A TEPP Steering Group was formed to guide the direction of TEPP and provide a coordination mechanism for the integration of transportation preparedness initiatives within the overall structure of the DOE Emergency Management System. Steering Group members represent Headquarters and field element transportation, radiological response, and emergency preparedness coordinators. Of the 10 TEPP initiatives, the following 7 remain and should be well-established by the near- and mid-term:
(1) development of a TEPP multiyear plan;
(2) establishment or strengthening of external coordination mechanisms;
(3) establishment of planning requirements for transportation incident response;
(4) development of a DOE-wide training and exercise program for transportation incident response [as the first in a projected series, in November 1990, DOE and the State of Colorado conducted a well-received joint field exercise, TRANSAX-90 (Section 2.5.1.6.)]; (5) establishment of a field assistance program; (6) development of a TEPP support program for State, Tribal, and local governments; and (7) development of a technology application program to support emergency response.

DOE continues to complement internal preparedness by addressing emergency

preparedness issues with external groups. Cooperative agreements have been initiated with the Western Governors' Association, Western Interstate Energy Board, and Southern States Energy Board. Several similar Indian Tribal cooperative agreements are in formative stages. Other cooperative DOE arrangements provide for information exchanges with urban officials and initiatives to improve local emergency response capabilities and procedures. EM is increasing its interactions with other Federal emergency preparedness elements by interlacing DOE regulatory and coordination needs through forums such as the Federal Radiological Preparedness Coordinating Committee and the National Response Team. EM will also continue to play an increasing role with other Federal agencies in the implementation of the new Hazardous Materials Transportation Uniform Safety Act. Such linkages foster understanding and progress in furthering TEPP initiatives to achieve a well-coordinated national response system to transportation emergencies.

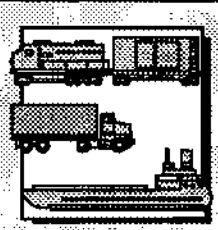
Shipments of transuranic wastes require specialized packaging and response consideration. Emergency response considerations are planned to be fully integrated into package design configurations. Furthermore, with transportation emergencies more likely to occur offsite under a variety of circumstances, EM is coordinating with the Office of Defense Programs to identify necessary equipment and procedures needed for response and self-protection that are not normally available to local responders on the scene.



REGIONAL COORDINATING OFFICE	POST OFFICE ADDRESS	TELEPHONE FOR ASSISTANCE	REGIONAL COORDINATING OFFICE	POST OFFICE ADDRESS	TELEPHONE FOR ASSISTANCE
1 BROOKHAVEN AREA OFFICE	UPTON, L.I. NEW YORK 11973	(516) 282-2200	5 CHICAGO FIELD OFFICE	9800 S. CASS AVE ARGONNE ILLINOIS 60439	DUTY (708) 972-4800 OFF (708) 972-5731
2 OAK RIDGE FIELD OFFICE	P.O. BOX 2001 OAK RIDGE TENNESSEE 37831	(615) 576-1005 OR (615) 525-7885	6 IDAHO FIELD OFFICE	785 DOE PLACE IDAHO FALLS IDAHO 83401	(208) 526-1515
3 SAVANNAH RIVER FIELD OFFICE	P.O. BOX A AIKEN SOUTH CAROLINA 29801	(803) 725-3333	7 SAN FRANCISCO FIELD OFFICE	1333 BROADWAY OAKLAND CALIFORNIA 94612	(415) 273-4237
4 ALBUQUERQUE FIELD OFFICE	PO BOX 5400 ALBUQUERQUE NEW MEXICO 87115	(505) 845-4667	8 RICHLAND FIELD OFFICE	P.O. BOX 550 RICHLAND WASHINGTON 99352	(509) 373-3800

Figure 2.5.1.5. DOE's eight regional coordinating offices are capable of responding to transportation radiological emergencies.

2.5.1.6 TRANSAX-90 TRAINING EXERCISE



A joint DOE/State of Colorado training exercise to prepare emergency responders for the possibility of a transportation incident involving Waste Isolation Pilot Plant (WIPP) shipments was successfully conducted on November 8, 1990.

DOE conducted a full-scale emergency response exercise on November 8, 1990, involving the transportation of three TRUPACT II shipping containers containing simulated radioactive waste. This exercise was designed to test selected aspects of the DOE Emergency Management System.

The TRUPACT II shipment was in transit from a DOE facility in Idaho to the WIPP disposal research facility near Carlsbad, New Mexico. The accident scene was located adjacent to Interstate Highway 25 in the vicinity of Colorado Springs, Colorado.

Exercise TRANSAX-90 involved DOE facilities located in Colorado, Idaho, New Mexico, and DOE Headquarters in Washington, D. C., and public safety officials from Colorado Springs (Figure 2.5.1.6a) and Colorado State officials.

This scenario involved a WIPP shipment transporter that was involved in an accident when a vehicle swerved in front of it. The TRUPACT II sustained a 1-ft gash in the outer container and damage to its "U" bolts. Several other vehicles were also involved in this simulated accident. In preparation for the exercise, EM prepared an Emergency Management Plan and designated a Headquarters Operational Emergency Management Team (OEMT) to handle such a transportation emergency. Formal training sessions on the group interaction and individual responsibilities were conducted. The team also participated in several tabletop scenarios in preparation for the actual exercise.

The OEMT was activated as a part of this test. DOE also activated a field office Emergency Operations Center in the Albuquerque Field Office and the DOE Radiological Assistance Team from Rocky Flats (Figure 2.5.1.6b). To further test its capability, DOE set up communications bridges between sites in an effort to transfer information in a real-time environment. The TRANSCOM tracking system was installed on the transporter as part of the exercise.

Independent evaluations of the DOE field elements and the Headquarters OEMT judged the test successful and stated the need for a continued exercise training program. Transportation Management Program and WIPP planners have developed a long-term program that continues to actively involve State, Tribal, and local governments. In preparation for this training, several basic transportation emergency exercise scenarios will be developed and coordinated with the Western Governors' Association.

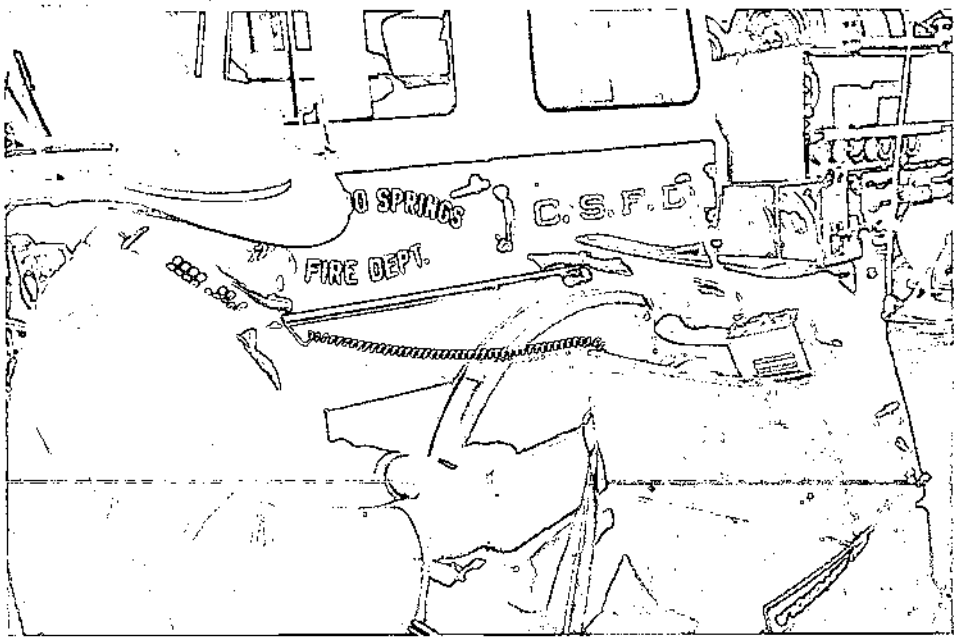


Figure 2.5.1.6a. Colorado Springs Fire Department coordinates with DOE during TRANSAX-90 exercise.

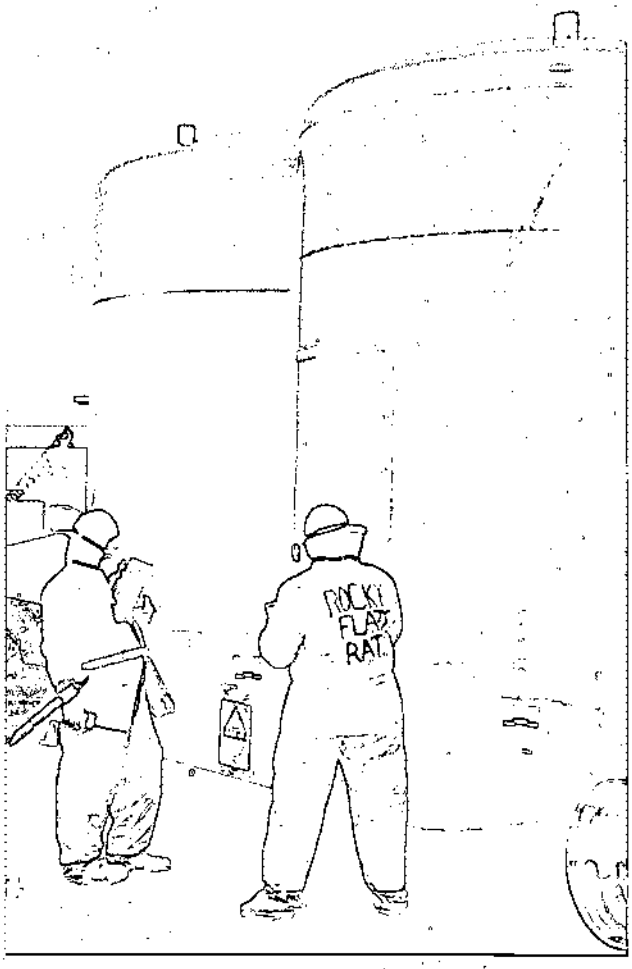
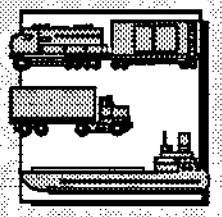


Figure 2.5.1.6b. Rocky Flats Radiological Assistance Team surveys TRUPACT II.

2.5.1.7 SCOPE AND ACCOMPLISHMENTS OF THE TRANSPORTATION OUTREACH PROGRAM



Informing and involving the public requires building a partnership of trust and communication.

DOE has a credibility problem. It stems from public distrust of large institutions, public concerns about nuclear activities, and public belief that DOE should have operated more overtly and placed more emphasis on the environmental effects of its activities. Although DOE's transportation record is excellent (there has never been a death or serious injury from the radioactive nature of the cargo due to a transportation accident), many people sincerely believe transporting radioactive materials is too dangerous to be acceptable.

Building trust and rapport is a long process, but it is a very necessary process if DOE is to resolve issues cooperatively. People and communities have a right to participate in decisions that affect their lives, their property, and the things they value. People offer local and regional insights that government decision makers need to consider. Knowledge of the technical merits, as well as the public's concerns and perceptions, is essential in making the right decisions.

The Transportation Outreach Program is committed to involving the public as a serious partner in planning, developing, and conducting transportation activities. Because transportation affects everyone, the public should have access to knowledge of DOE activities. Moreover, the public has a right to express concerns and make suggestions. The Transportation Management Program (TMP) has recently issued a final draft Transportation Outreach Plan that describes how DOE plans to conduct its public interaction activities. In general, there are two facets to the program: (1) informing the public by explaining the program through informational materials and activities and (2) involving the public by encouraging and facilitating communications with interested and affected parties.

Informing the Public: The public has diverse levels of understanding, interests, needs, and concerns. Information specifically adapted to these varying audiences and levels is essential in fostering a well-informed public and in responding to its needs. The TMP produces materials and activities that present information in a variety of meaningful, understandable, and interesting ways. Booklets, fact sheets, videotapes, and exhibits have been developed to describe the various aspects of the transportation program. Emphasis has been given to wider distribution of materials appropriate to each audience, including students; teachers; public safety officials; Federal, Tribal, State and local governments; industry; and the general public. Information on available publications can be obtained from the

Transportation Information and Communications Resource Center, EM-50.1, U.S. Department of Energy, Washington, D.C. 20585.

Involving the Public: Essential to the planning and conduct of transportation activities is two-way communication between all those affected by or interested in DOE activities. Each locality, region, and group has its own set of needs and concerns, and DOE must understand and consider them all in making decisions that will affect them.

DOE has entered into cooperative and contractual agreements on the national, regional, and local levels to solicit input from a cross section of the United States. These involve Indian Tribal governments whose reservations will be crossed by or are adjacent to Waste Isolation Pilot Plant (WIPP) shipment routes, the Western Governors' Association Task Force, the Southern States Energy Board, and the Urban Energy and Transportation Corporation, a group representing local governments in the United States. In addition, TMP chairs or participates in groups such as the WIPP Transportation Task Force and the State and Tribal Government Working Group on transportation-related subjects. TMP also supports the international symposium on the Packaging and Transportation of Radioactive Materials held every 3 years. The next symposium is to be held near Tokyo, Japan, in 1992. TMP also supports the transportation-related public involvement activities associated with National Environmental Policy Act compliance.

The goal of the TMP Outreach activities is to facilitate a clear understanding of concerns and positions and to work together with the various public groups in addressing the issues. Public participation is a valued part of the TMP.

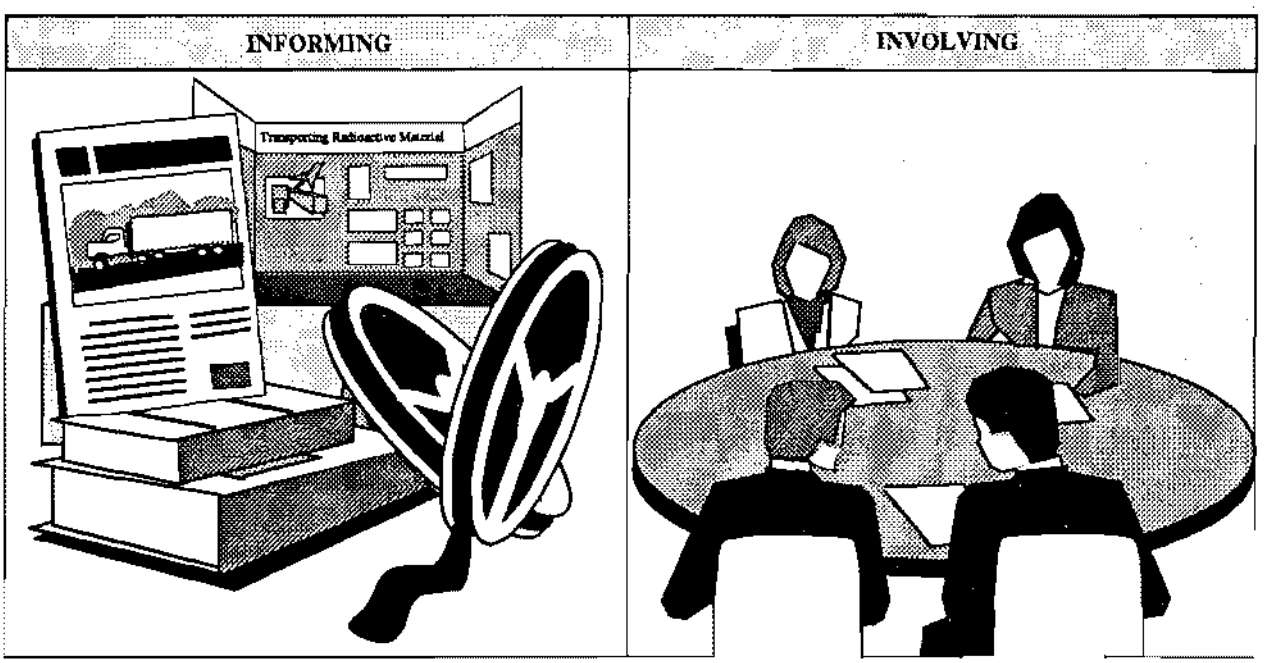
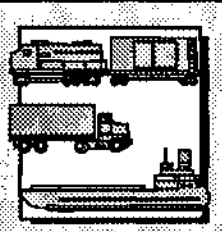


Figure 2.5.1.7. The outreach program provides information and promotes interactions to help address transportation issues.

2.5.1.8 PLANS AND FUNDING FOR FY 1991-1997



Continuing vigilance and advancements in transportation and packaging research, development, operations, emergency preparedness, and public interaction will pave the way for a transportation future as safe as its past.

The Transportation Management Program (TMP) has overall responsibility to ensure that the transportation needs of all DOE programs are met consistently within regulatory requirements and sound operational procedures. To accomplish this, TMP funds a continuing core of activities each year to maintain the routine requirements of safely shipping DOE materials. These activities include regulations review and compliance, training, data management, operational and packaging efficiencies, basic research, packaging testing facilities management, informational materials development, and institutional liaison. TMP also responds to changing program needs, new regulatory requirements, and transportation issues and areas of concern arising from program decisions. These needs include new training and operational needs, improvements in emergency preparedness, public and institutional liaison activities associated with specific programs or shipping campaigns, and requirements for new packagings and transportation systems resulting from program needs.

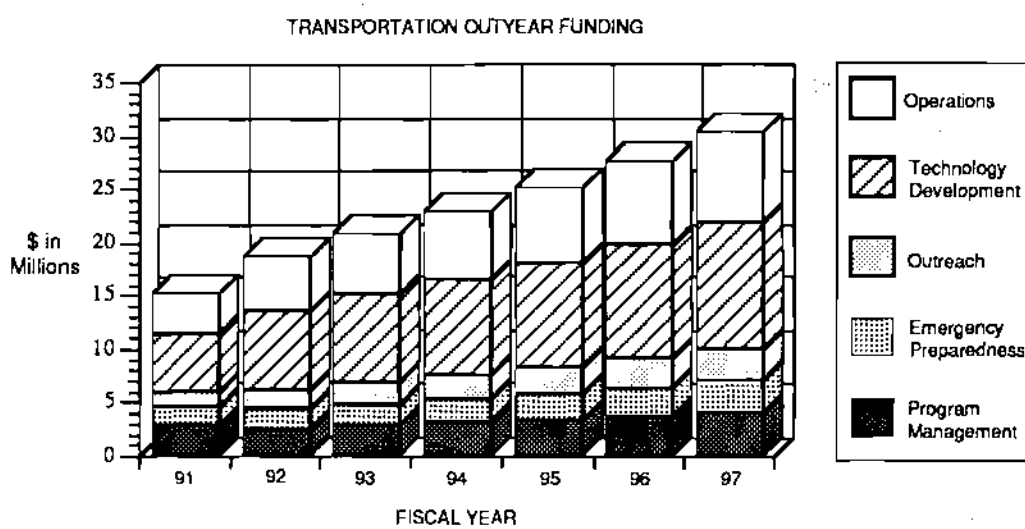
Key changes in DOE organization, procedures, and management philosophy have occurred in the last several years, with a shift away from nuclear materials production to a greater emphasis on environmental cleanup and working openly and cooperatively with institutional and public representatives. More definitive planning by EM has revealed the potential for new and additional transportation needs for hazardous and mixed waste transportation, both for shipping samples for study and as part of the site cleanups. The TMP has determined this would be an appropriate time to conduct a comprehensive assessment of DOE's transportation function, specifically as it affects EM, but also as it pertains to all DOE programs. Therefore, a Transportation Assessment and Integration (TRAIN) study is being conducted to observe long-range goals, issues, and needs in relation to current capabilities.

TRAIN Study: Initially, the scope of the study will encompass the following areas:

- TMP organizational roles and responsibilities;
- Packaging and transportation needs;
- Regulatory posture;
- Institutional affairs and outreach;
- Traffic management and packaging operations;
- Research, development, and technology;
- Emergency preparedness;
- Relationships with DOE laboratories;
- Role of the private sector; and
- TMP and the international community.

The TMP assessment will solicit input from DOE, contractor, industry, research, and Federal, Tribal, State, local, and other public representatives. The report on this study is scheduled to be issued in early 1992 and will be the basis for long-range planning.

The TMP has been in operation for many years, serving the needs of the Atomic Energy Commission, the Energy Research and Development Administration, and the present-day DOE. Through planning for the future and innovative advancements, DOE has maintained a safe, efficient transportation program to meet the needs of all DOE activities. The next 5 years will continue to build on this success.



Fiscal Year	FY91	FY92	FY93	FY94	FY95	FY96	FY97
$ in Millions	15.2	18.9	20.8	22.8	25.1	27.6	30.4

Figure 2.5.1.8a. Funding for safe, efficient continuing operations, innovative research and technology development, and a meaningful public role will help maintain the success of DOE's transportation activities.

	Fiscal Year (Thousands of Dollars)						
OFFICE	1991	1992	1993	1994	1995	1996	1997
Albuquerque	5,789	7,660	8,426	9,269	10,195	11,215	12,337
Chicago	205	205	226	248	273	300	330
Nevada	250	300	330	363	399	439	483
Oak Ridge	3,395	4,970	5,467	6,014	6,615	7,277	8,004
Richland	3,585	3,835	4,219	4,640	5,104	5,615	6,176
Headquarters	1,967	1,900	2,090	2,299	2,529	2,782	3,060
TOTAL	15,191	18,870	20,757	22,833	25,116	27,628	30,390

Figure 2.5.1.8b. TMP activities are implemented through field and contractor support. The Validated Target Level and the Preliminary Unvalidated Case are the same.

Environmental Restoration & Waste Management

Installation Summaries, Technology Summaries, Supporting Technology Summaries, Technology Integration Program, and Transportation Activities 1993-1997

SECTION 3

August 1991

ENVIRONMENTAL RESTORATION & WASTE MANAGEMENT

Installation Summaries, Technology Summaries, Supporting Technology Summaries, Technology Integration Program, and Transportation Activities 1993-1997

SECTION 3

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SECTION 3

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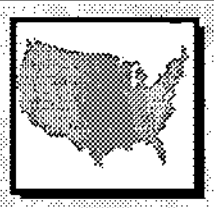
3.0 INTRODUCTION



Section 3 is composed of summaries for all EM sites and technology areas.

As part of the 5-year planning process, each program activity developed summaries for inclusion within this document. Section 3 contains these summaries for all EM Programs. It consists of Installation Summaries, Technology Development Summaries, and Summaries of Transportation Activities. Requirements of these summaries were standardized as much as possible and are as follows:

- 3.1 INSTALLATION SUMMARIES: Installation Summaries provide a synopsis of the past, present, and future activities of each major EM installation. These summaries are listed by field office, with subordinate offices included within the field office section. They include a brief facility description, major milestones for programs active at those installations, a progress chart indicating the status of commitments made in previous Five-Year Plans, a listing of Status/Accomplishments, a description of issues particular to that installation, and both the Validated Target Level (VTL) and Preliminary Unvalidated Cases (PUC). Where requirements for components of the installation summary do not apply to a site, they were omitted. Components of Installations Summaries are:

Facility Description: A brief description of the field office and installation covering the goals of the program at a specific installation, including goals, mission statements, or activity descriptions.

Major Milestones: Milestones from FY 1992-1996 Five-Year Plan, or modified milestones based on renegotiated agreements or self-assessments or other evaluations of programs. Changes are documented in the text. All milestones are based on VTL. Milestones for Corrective Activities, Waste Management, and Environmental Restoration programs reflect completion dates for major activities.

Progress Chart: The Progress Chart for each Installation providing for the VTL, and indicating only key milestones. Progress charts are designed to show interrelationships among activities and to show the role of Technology Development for each installation.

Status/Accomplishments: Reflects year-to-date milestones completion. It reflects FY 1990-1991 accomplishments and delays in achieving planned accomplishments or commitments for 1990-1991 that were listed in FY 1992-1996 Five-Year Plan.

Issues: Those items that affect the accomplishment of goals or objectives. They include applicable regulations and environmental, health, and safety risks as identified by the installation.

Funding: Contains data on two funding cases. Funding is divided between Defense and Nondefense categories to ensure accountability to Congress and the people, since monies are authorized to DOE in specific programmatic areas. Dollars presented in Installation Summaries are in thousands.

- 3.2 TECHNOLOGY SUMMARIES: Technology Summaries include key Applications Areas: Groundwater and Soils Cleanup; Waste Retrieval and Waste Processing; and Waste Minimization. Each consists of the following elements:

Overview: This section presents the Needs (statements of the issues requiring solutions), Objectives (planned solutions for each issue), Benefits (statements of how program implementation will assist EM and the worldwide EM industry), and Summaries of each of the Integrated Demonstrations (IDs) in the three Applications Areas.

Within each Applications Area, objectives, benefits, funding, and milestones are presented. Accomplishments, plans, and activities are also shown for those IDs started in the FY 1990-1992 time frame. Accomplishments, plans, and activities are being developed for the IDs in the planning stage. Each element is presented per definitions previously stated.

- 3.2.1 SUPPORTING TECHNOLOGY SUMMARIES:
The Analytical Services Program, the International Technology Exchange (ITE), Risk Management, and Robotics Technology Development Summaries are included as Supporting Technology Summaries. Each describes the program needs, objectives, benefits, accomplishments, plans and activities, funding (VTL and PUC), and milestones.

- 3.2.2 TECHNOLOGY INTEGRATION: The Technology Integration Program, with its cross-cutting with the needs of other groups within OTD, is summarized separately from Supporting Technology programs, but includes information similarly organized.

- 3.3 TRANSPORTATION ACTIVITIES: Transportation Activities for the Albuquerque, Chicago, Nevada, Oak Ridge, and Richland Field Offices describe the activities, regulatory authority/drivers references, accomplishments, plans and activities, funding (both VTL and PUC), and the program milestones. Elements of the Transportation Activities Summaries include activities (description of the major activities of each summary), regulatory authorities, drivers, and references (key requirements that impact the activities), accomplishments, plans and activities, funding, and milestones. Planned funding by program and by installation is tabulated at the beginning of Section 3.

CORRECTIVE ACTIVITIES FUNDING BY INSTALLATION
VALIDATED TARGET LEVEL (VTL)
(Thousands of Dollars)

Field Office/ Installation	FY91	FY92	FY93	FY94	FY95	FY96	FY97
ALBUQUERQUE							
Inhalation Toxicology Research Institute	80	103	0	0	0	0	0
Kansas City Plant	5,549	4,140	2,736	329	342	355	0
Lost Alamos National Laboratory	12,746	19,565	10,380	3,272	2,290	1,899	1,938
Mound Plant	1,755	41	0	0	0	0	0
Pantex Plant	500	0	0	0	0	0	0
Sandia National Laboratory-Albuquerque	20	3,308	2,240	0	0	0	0
Sandia National Laboratory-Livermore	280	755	0	0	0	0	0
ALBUQUERQUE TOTAL	20,930	27,912	15,356	3,601	2,632	2,254	1,938
CHICAGO							
Argonne National Laboratory-East	6,264	9,292	1,990	0	0	0	0
Argonne National Laboratory-West	603	529	247	0	0	0	0
Brookhaven National Laboratory	2,004	238	0	0	0	0	0
Fermilab	512	569	0	0	0	0	0
Princeton Plasma Physics Laboratory	0	270	0	0	0	0	0
CHICAGO TOTAL	9,383	10,898	2,237	0	0	0	0
FEED MATERIAL PRODUCTION CENTER	48,464	0	0	0	0	0	0

CORRECTIVE ACTIVITIES FUNDING BY INSTALLATION
VALIDATED TARGET LEVEL (VTL)
(Thousands of Dollars)

Field Office/Installation	FY91	FY92	FY93	FY94	FY95	FY96	FY97
IDAHO	13,978	7,000	0	0	0	0	0
NEVADA	836	1,660	0	0	0	0	0
OAK RIDGE							
Oak Ridge National Lab	9,665	19,887	16,954	12,583	10,482	0	0
Oak Ridge Associated Universities	43	48	0	0	0	0	0
Paducah Gaseous Diffusion Plant	2,750	12,659	16,225	8,835	7,300	42,200	6,700
Portsmouth Gaseous Diffusion Plant	6,500	8,425	20,701	6,390	0	0	0
Y-12 Plant	6,000	15,777	1,030	600	300	0	0
OAK RIDGE TOTAL	24,958	56,796	54,910	28,408	18,082	42,200	6,700
RICHLAND	22,795	13,977	2,455	0	0	0	0
ROCKY FLATS	1,381	2,251	0	0	0	0	0
SAN FRANCISCO							
Lawrence Berkeley Laboratory	2,015	4,980	0	0	0	0	0
Lawrence Livermore National Laboratory	255	17,955	15,700	9,000	0	0	0
Santa Susana Field Laboratory	3,087	25	0	0	0	0	0
SAN FRANCISCO TOTAL	5,357	22,960	15,700	9,000	0	0	0
SAVANNAH RIVER	47,600	0	0	0	0	0	0
HEADQUARTERS	0	0	0	0	0	0	0
CORRECTIVE ACTIVITIES TOTAL	195,682	143,454	90,658	41,009	20,714	44,454	8,368

WASTE MANAGEMENT FUNDING BY INSTALLATION
VALIDATED TARGET LEVEL (VTL)
(Thousands of Dollars)

Field Office/Installation	FY91	FY92	FY93	FY94	FY95	FY96	FY97
ALBUQUERQUE							
Albuquerque Office	10,189	240	4,825	10,567	4,090	4,160	4,231
Inhalation Toxicology Research Institute	166	893	449	472	490	509	527
Kansas City Plant	4,705	7,933	7,060	9,320	7,195	9,848	7,746
Los Alamos National Laboratory	26,919	58,834	68,441	103,051	113,051	122,705	133,450
Mound Plant	4,680	8,396	9,629	11,696	15,297	12,269	9,039
Pantex Plant	9,200	19,368	16,800	14,942	24,813	24,975	17,316
Pinellas Plant	1,558	1,567	2,572	2,665	2,771	2,881	2,996
Sandia National Laboratories-Albuquerque	9,137	17,837	16,050	16,156	20,085	27,789	43,398
Sandia National Laboratories-Livermore	1,200	1,775	1,866	2,042	2,518	2,729	3,003
Waste Isolation Pilot Plant	163,708	142,118	185,000	177,816	215,597	237,000	232,101
ALBUQUERQUE TOTAL	231,542	258,961	312,692	348,690	405,907	444,865	453,807
CHICAGO							
Ames Laboratory	86	205	164	221	215	230	255
Argonne National Laboratory-East	7,091	4,328	14,994	20,360	20,251	21,804	23,715
Argonne National Laboratory-West	1,331	1,810	2,250	3,168	3,090	3,330	3,668
Brookhaven National Laboratory	4,238	7,195	6,690	8,440	9,230	12,469	9,768
Chicago Office	711	644	1,185	950	980	1,011	1,042
Fermilab	1,183	1,531	1,947	2,465	2,405	2,479	2,484
Princeton Plasma Physics Laboratory	614	650	1,027	1,290	1,255	1,350	1,407
CHICAGO TOTAL	15,254	16,363	28,257	36,894	37,426	42,673	42,339

WASTE MANAGEMENT FUNDING BY INSTALLATION
VALIDATED TARGET LEVEL (VTL)
(Thousands of Dollars)

Field Office/Installation	FY91	FY92	FY93	FY94	FY95	FY96	FY97
FEED MATERIAL PRODUCTION CENTER	33,682	0	0	0	0	0	0
IDAHO							
Idaho Chemical Processing Plant	92,623	101,955	140,487	150,215	170,729	187,801	206,579
Idaho National Engineering Laboratory	117,336	112,121	134,254	136,365	137,115	136,527	145,275
West Valley Demonstration Project	79,073	104,000	124,000	126,000	127,000	130,000	135,000
Landlord	24,175	34,121	45,300	64,970	80,050	81,700	70,020
IDAHO TOTAL	313,207	352,197	444,041	477,550	514,894	536,028	556,874
NEVADA	9,506	13,819	14,410	19,773	20,248	22,266	24,485
OAK RIDGE							
Oak Ridge National Lab	49,600	109,316	131,118	137,332	145,960	165,761	182,223
Oak Ridge Associated Universities	0	34	0	38	40	42	44
Oak Ridge Office	9,898	3,215	4,800	4,900	5,000	5,100	5,100
Paducah Gaseous Diffusion Plant	5,679	17,643	40,876	59,114	49,964	45,864	33,451
Portsmouth Gaseous Diffusion Plant	7,000	34,561	23,770	52,565	62,740	51,390	36,065
Y-12 Plant	42,710	71,932	64,920	74,116	76,933	81,973	90,171
OAK RIDGE TOTAL	114,887	236,701	265,484	328,065	340,637	350,130	337,054
RICHLAND							
Hanford	605,975	711,210	844,667	857,897	948,135	1,109,048	1,217,275
Landlord	37,564	52,575	55,900	53,844	38,391	40,298	44,906
RICHLAND TOTAL	643,539	763,785	900,567	911,781	986,526	1,149,346	1,262,181
ROCKY FLATS	89,904	95,041	94,108	106,570	117,503	129,253	142,178

WASTE MANAGEMENT FUNDING BY INSTALLATION
VALIDATED TARGET LEVEL (VTL)
(Thousands of Dollars)

Field Office/Installation	FY91	FY92	FY93	FY94	FY95	FY96	FY97
SAN FRANCISCO							
Energy Technical Engineering Center	0	0	0	0	0	0	0
Lawrence Berkeley Laboratory	0	0	5,220	9,443	8,940	8,932	9,616
Lawrence Livermore Laboratory	14,103	30,640	32,154	40,547	38,497	67,777	35,296
Santa Susana Field Laboratory	1,385	4,540	571	560	377	0	0
Stanford Linear Accelerator Center	275	348	2,006	2,196	2,306	2,421	2,542
SAN FRANCISCO TOTAL	17,263	35,528	42,501	55,321	52,695	81,705	50,029
SAVANNAH RIVER	508,536	491,325	502,301	541,002	567,487	612,220	668,793
HEADQUARTERS	58,475	143,147	139,687	226,547	312,014	286,452	435,771
WASTE MANAGEMENT TOTAL	2,035,795	2,406,867	2,744,048	3,070,193	3,355,327	3,654,938	3,973,510

ENVIRONMENTAL RESTORATION FUNDING BY INSTALLATION
VALIDATED TARGET LEVEL (VTL)
(Thousands of Dollars)

FIELD OFFICE/INSTALLATION	FY91	FY92	FY93	FY94	FY95	FY96	FY97
ALBUQUERQUE							
Inhalation Toxicology Research Institute	65	4,340	2,733	1,647	1,541	606	320
Kansas City Plant	5,681	15,848	7,935	10,063	21,958	30,282	31,544
Los Alamos National Laboratory	22,908	62,955	74,553	97,245	95,240	102,124	95,237
Mound Plant	24,966	37,178	28,164	25,175	27,237	36,739	33,354
Pantex Plant	10,368	10,856	18,302	11,526	8,861	5,854	8,099
Pinellas Plant	3,218	3,040	5,900	18,845	4,238	4,643	4,688
Sandia National Laboratories - Albuquerque	6,030	13,082	15,979	11,375	27,577	15,979	34,556
Sandia National Laboratories - Livermore	1,883	7,653	4,198	2,013	1,156	1,009	854
South Valley Site	3,000	2,064	872	872	839	809	780
Albuquerque - Other[1]	7,025	8,373	6,741	5,388	5,069	4,927	4,789
Facilities & Sites SUBTOTAL	85,144	165,389	165,377	184,149	193,716	202,972	214,221
Uranium Mill Tailings Remedial Action Proj.	87,867	106,016	111,675	73,586	42,866	32,259	30,999
ALBUQUERQUE TOTAL	173,011	271,405	277,052	257,735	236,582	235,231	245,220
CHICAGO							
Argonne National Laboratory - East	10,220	6,137	7,636	9,573	9,576	7,896	8,110
Argonne National Laboratory - West	1,134	985	985	1,284	1,379	1,115	1,119
Brookhaven National Laboratory	7,138	4,418	6,266	6,005	6,451	5,247	5,234
Battelle Columbus Laboratory	12,075	18,028	14,353	20,200	18,595	14,716	13,018
Combined Laboratories	0	14	930	955	0	0	0
Chicago - Other[2]	1,225	1,209	2,041	2,402	2,829	2,027	2,006
Facilities & Sites SUBTOTAL	31,792	30,791	32,211	40,419	38,830	31,001	29,487
UMTRAP - BNL	300	340	370	97	0	0	0
FUSRAP - ANL - E	1,700	1,325	675	675	649	626	603
CHICAGO TOTAL	33,792	32,456	33,256	41,191	39,479	31,627	30,090
FERNALD							
Feed Materials Production Center	179,986	234,891	334,891	371,150	392,751	416,756	441,636
FERNALD TOTAL	179,986	234,891	334,891	371,150	392,751	416,756	441,636

ENVIRONMENTAL RESTORATION FUNDING BY INSTALLATION
VALIDATED TARGET LEVEL (VTL)
(Thousands of Dollars)

FIELD OFFICE/INSTALLATION	FY91	FY92	FY93	FY94	FY95	FY96	FY97
IDAHO							
Grand Junction Projects Office Site	11,600	16,723	16,723	18,403	14,444	11,247	10,211
Idaho National Engineering Laboratory	48,266	57,077	57,077	71,125	77,463	79,784	83,850
Facilities & Sites SUBTOTAL	59,866	73,800	73,800	89,528	91,907	91,031	94,061
UMTRAP - GJPO	30,872	34,630	29,025	3,314	308	270	91
IDAHO TOTAL	90,738	108,430	102,825	92,842	92,215	91,301	94,152
NEVADA							
Nevada Test Site	13,748	28,210	28,464	31,970	34,040	36,048	38,286
Nevada Offsite Locations	369	1,400	1,264	866	594	596	326
NEVADA TOTAL	14,117	29,610	29,728	32,836	34,634	36,644	38,612
OAK RIDGE							
Oak Ridge K-25 Site (EM)	96,793	92,415	136,869	177,903	177,654	166,080	190,783
(UE)	9,893	51,802	77,424	78,532	95,021	82,220	97,293
Oak Ridge National Laboratory	50,937	86,606	75,700	84,296	88,754	83,311	82,968
Paducah Gaseous Diffusion Plant (EM)	0	14,000	25,720	23,476	20,449	20,903	21,310
(UE)	28,629	14,624	23,325	19,838	15,565	16,142	16,557
Portsmouth Gaseous Diffusion Plant (EM)	0	15,000	15,000	16,749	17,156	22,994	24,911
(UE)	28,897	9,073	11,391	13,968	14,308	20,214	22,075
Weldon Spring Site Remedial Action Project	25,932	49,000	50,963	39,034	46,313	50,671	32,047
Oak Ridge Y-12 Plant	17,521	27,014	32,600	36,106	36,814	33,498	34,172
Oak Ridge - Other[3]	43,241	20,765	9,808	7,402	7,414	7,413	7,424
Facilities & Sites SUBTOTAL	271,843	380,299	458,800	497,304	519,448	503,446	529,540
Formerly Utilized Sites Remedial Act Program	25,985	45,500	37,900	43,702	44,847	43,753	44,695
FUSRAP - K-25, ORNL, ORAU	1,515	1,225	1,610	1,073	1,161	1,278	1,370
UMTRAP - K-25, ORNL	501	154	210	115	120	125	130
OAK RIDGE TOTAL	329,844	427,178	498,520	542,194	565,576	548,602	575,735
RICHLAND							
Hanford Site	130,851	154,900	169,514	172,907	181,790	189,877	200,238
RICHLAND TOTAL	130,851	154,900	169,514	172,907	181,790	189,877	200,238

ENVIRONMENTAL RESTORATION FUNDING BY INSTALLATION
VALIDATED TARGET LEVEL (VTL)
(Thousands of Dollars)

FIELD OFFICE/INSTALLATION	FY91	FY92	FY93	FY94	FY95	FY96	FY97
ROCKY FLATS							
Rocky Flats Plant	65,000	50,000	55,000	55,325	58,546	62,123	65,834
ROCKY FLATS TOTAL	65,000	50,000	55,000	55,325	58,546	62,123	65,834
SAN FRANCISCO							
Santa Susana Field Laboratory	5,296	9,078	5,707	3,510	4,243	2,044	2,642
Lawrence Livermore National Laboratory	20,979	23,300	26,015	21,980	16,903	15,988	15,387
Lawrence Berkeley Laboratory	4,118	1,559	2,700	5,649	6,474	5,799	6,258
Stanford Linear Accelerator Center	0	0	94	441	1,061	1,429	1,421
Laboratory for Energy - Related Health R.	1,007	5,433	3,638	7,065	8,754	3,712	1,341
San Francisco - Other[4]	1,900	2,030	3,246	10,058	11,685	9,113	9,936
Facilities & Sites SUBTOTAL	33,300	41,400	41,400	48,703	49,120	38,085	36,985
UMTRAP - SLAC	0	0	0	250	96	46	45
SAN FRANCISCO TOTAL	33,300	41,400	41,400	48,953	49,216	38,131	37,030
SAVANNAH RIVER							
Savannah River Site	47,500	55,260	45,060	61,211	64,731	68,576	72,636
SAVANNAH RIVER TOTAL	47,500	55,260	45,060	61,211	64,731	68,576	72,636
HEADQUARTERS[5]							
Facilities & Sites	74,771	68,784	71,877	80,502	150,137	225,560	343,302
UMTRAP - HQ	450	760	620	288	130	75	70
FUSRAP - HQ	0	950	715	1,050	1,100	1,100	1,100
HEADQUARTERS TOTAL	75,221	70,494	73,212	81,840	151,367	226,735	344,472
Facilities & Sites (EM)	956,751	1,209,625	1,365,518	1,521,696	1,650,716	1,747,495	1,930,627
(UE)	67,419	75,499	112,140	112,338	124,894	118,576	135,925
UMTRAP	119,990	141,900	141,900	77,650	43,520	32,775	31,335
FUSRAP	29,200	49,000	40,900	46,500	47,757	46,757	47,768
ER TOTAL	1,173,360	1,476,024	1,660,458	1,758,184	1,866,887	1,945,603	2,145,655

1 No Installation Summary included in Section III. Funding provides for compliance oversight and program support activities at DOE-Albuquerque.

2 No Installation Summary included in Section III. Funding provides for compliance oversight and program support activities at DOE-Chicago, as well as surveillance and maintenance of the Hallam and Piqua Nuclear Power Facilities and decommissioning of the Separations Process Reseach Unit at Knolls Atomic Power Laboratory.

3 No Installation Summary included in Section III. Funding provides for compliance oversight and program support activities at DOE-Oak Ridge, as well as cleanup work at Oak Ridge Associated Universities.

4 No Installation Summary included in Section III. Funding provides for compliance oversight and program support activities at DOE-San Francisco, as well as decommissioning work at the Atomics International, General Atomics, and Vallicitos Nuclear Center Sites.

5 No Installation Summary included in Section III. Funding provides for Headquarters and field program direction support, technical support at Headquarters, and cleanup work at the Maxey Flats Disposal Site.

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ALBUQUERQUE FIELD OFFICE
INSTALLATION SUMMARY
INHALATION TOXICOLOGY RESEARCH INSTITUTE

FACILITY DESCRIPTION

The Inhalation Toxicology Research Institute (ITRI) in Albuquerque, New Mexico, investigates the nature and magnitude of human health effects from the inhalation of airborne material. ITRI occupies ~ 200,000 ft² of laboratory space on the south edge of Kirtland Air Force Base. The laboratory houses up to 15,000 research animals and generates sanitary, hazardous, radioactive, and mixed wastes. ITRI conducts studies on the health effects of inhaling fission products, fuel cycle actinides, insulating materials, coal combustion effluents, and diesel exhaust emissions.

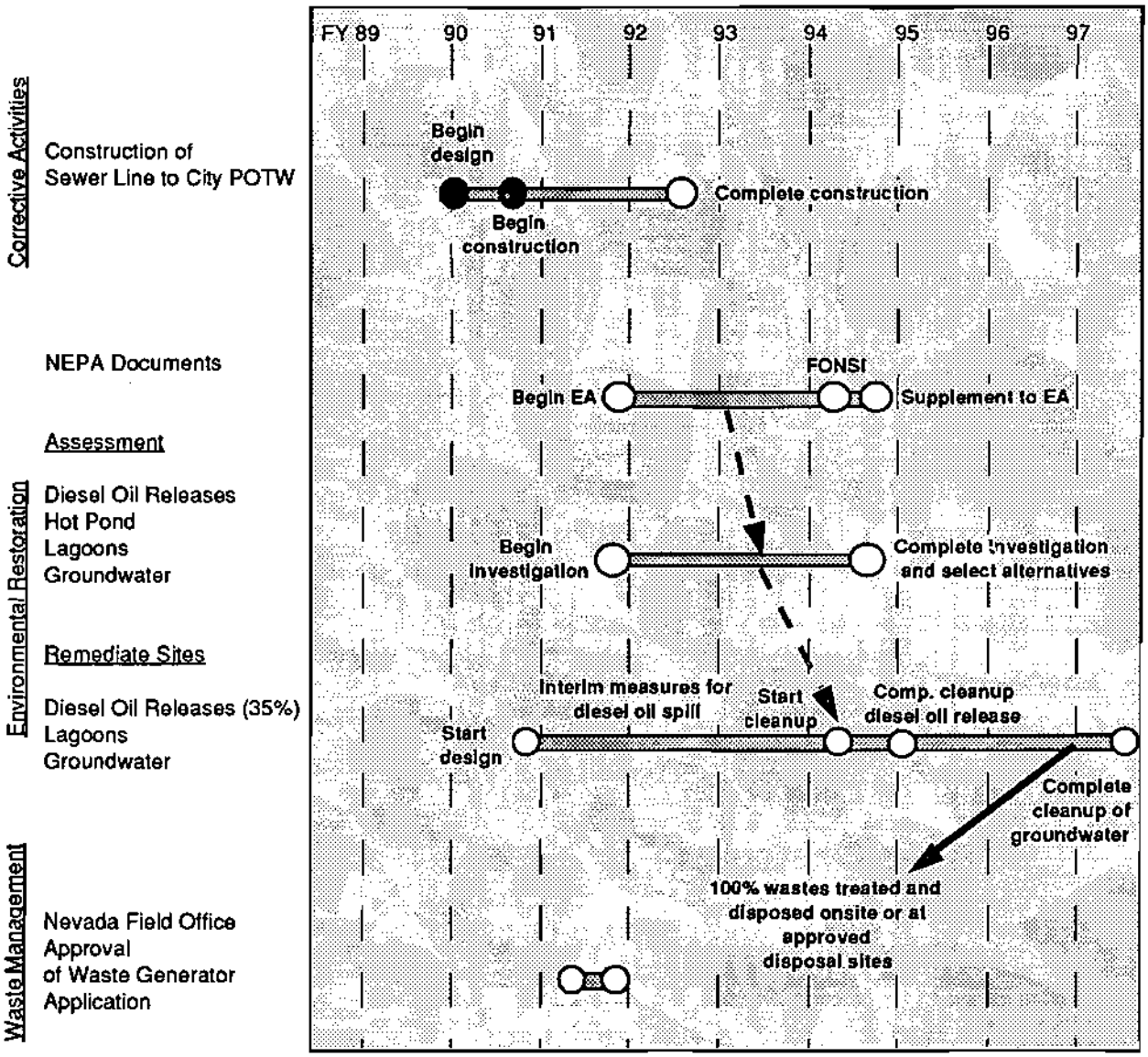
MAJOR MILESTONES

Corrective Activities	Date
• Complete removal and relocation of tanks and lines.	FY 1991
• Complete construction of a sewer line to city publicly owned treatment works (POTW).	FY 1992
Waste Management	
• Properly treat scintillation vial mixed waste.	FY 1991
• Complete construction of waste treatment and storage facility upgrade.	FY 1993
Environmental Restoration	
• Complete assessments for sanitary lagoons, diesel oil release, and hot ponds.	FY 1993
• Complete Environmental Assessment (EA) and issue Finding of No Significant Impact (FONSI).	FY 1993
• Complete assessment for site groundwater.	FY 1994
• Complete remediation of nitrates in groundwater.	FY 1997
• Complete remediation of sanitary lagoons.	FY 2000

Progress Chart for Albuquerque Field Office: Inhalation Toxicology Research Institute*

Long-Term Objectives:
Disposal of sewage to POTW by FY 1992
Remove all underground storage tanks by FY 1992
Clean up lagoon, hot pond, groundwater, diesel oil spills

Five-Year Objectives:
Lagoon site cleaned up
Hot pond site assessment completed
Diesel oil spills 35 percent cleanup
Groundwater remediated and monitoring program in place



Legend
- ○ Planned Milestones
- ● Completed Milestones
- — — ► Information Flows
- ——► Material Flows
- ▒ Activities

Acronyms and Initialisms

NEPA- National Environmental Policy Act

* For Validated Target Level

STATUS/ACCOMPLISHMENTS

Corrective Activities

- Two empty fuel tanks were removed in October 1989.
- Sewer line design was completed, and construction is in progress.

Waste Management

- Generator's application for disposal of low-level waste at the Nevada Test Site has been submitted in accordance with the Nevada Field Office NVO-325.
- No hazardous or radioactive wastes are disposed of onsite.
- One hundred thirty seven drums of actinide-containing Low-Level Waste Scintillation Cocktail vial wastes have been shipped offsite for commercial treatment.
- Nevada Field Office approval of the ITRI radioactive waste generator application by August 1991.

Environmental Restoration

- Underground Storage Tanks (USTs) were tested; one tank failed tightness tests and was permanently removed from service.
- Two empty USTs have been removed.
- Diesel oil contamination of soil to a depth of 112 ft has been found. Interim remediation (soil venting) is under way.
- Cleanup of hot pond contents has been completed, and all radioactive sediment has been removed. Contaminated concrete structure remains and will require assessment and possible cleanup.

ISSUES

- If ITRI is unable to connect to the Albuquerque Sewage Treatment Plant, a POTW, the New Mexico Environmental Improvement Division, could withdraw the discharge permit and effectively shutdown the facility. This would also affect the plan to discontinue the use and cleanup of the sanitary lagoons.
- Leakage of diesel oil from USTs and distribution lines is potentially contaminating soil and groundwater.
- Additional air/water pollution conditions may have to be addressed.
- New land disposal restrictions concerning laboratory packs place severe constraints on the types of laboratory packs and alternatives to disposal.

Funding: Validated Target Level ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	80	0	166	0	65	0	0	311
FY92	0	103	0	893	0	4,065	0	275	5,336
FY93	0	0	0	449	0	2,583	0	150	3,182
FY94	0	0	0	472	0	231	0	1,416	2,119
FY95	0	0	0	490	0	0	0	1,541	2,031
FY96	0	0	0	509	0	0	0	606	1,115
FY97	0	0	0	527	0	0	0	320	847
FY93-97	0	0	0	2,447	0	2,814	0	4,033	9,294

Funding: Preliminary Unvalidated Case ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	80	0	166	0	65	0	0	311
FY92	0	103	0	893	0	4,065	0	275	5,336
FY93	0	0	0	449	0	1,983	0	750	3,182
FY94	0	0	0	472	0	881	0	1,216	2,569
FY95	0	0	0	490	0	0	0	2,427	2,917
FY96	0	0	0	509	0	0	0	941	1,450
FY97	0	0	0	527	0	0	0	522	1,049
FY93-97	0	0	0	2,447	0	2,864	0	5,856	11,167

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.

ALBUQUERQUE FIELD OFFICE INSTALLATION SUMMARY KANSAS CITY PLANT

FACILITY DESCRIPTION

The Kansas City Plant (KCP) is part of the Bannister Federal Complex, located 12 miles south of downtown Kansas City, Missouri. Manufacturing operations are housed in 3.2 million ft^2 of building space. The plant mission is the manufacture of non-nuclear weapon components involving machining, plastic fabrication, and electrical and mechanical assembly. No radioactive materials are machined or processed. Waste Operations consist primarily of waste storage, offsite shipment and disposal, and onsite wastewater treatment for industrial process wastewaters. Thirty-six sites are identified in the RCRA 3008(h) Administration Order on Consent for Environmental Restoration.

MAJOR MILESTONES

Corrective Activities	Date
• Complete contaminated flow collection and treatment system to protect hazardous and toxic wastes and facilities to 500-year flood level.	FY 1993
• Complete flood protection system.	FY 1994

Waste Management	
• Revise RCRA Part A and Part B Permit Applications.	FY 1992
• Upgrade hazardous waste tank farm.	FY 1992
• Initiate shipment of low-level waste to Nevada Test Site.	FY 1992
• Install backup batch treatment systems.	FY 1992
• Obtain RCRA Final Permit.	FY 1993
• Upgrade hazardous waste storage facilities.	FY 1994
• Complete Process Waste Assessments.	FY 1994
• Complete construction of equalization tank enclosure.	FY 1996

Environmental Restoration	
• Complete assessments of:	
South Lagoon and Northeast Area,	FY 1992
Plating Building and Department 26,	FY 1993
Classified Waste Trenches, Miscellaneous Contaminated Soil Sites	
Outfall 001 Raceway, and	FY 1994
Department 27-Inside.	FY 1995
• Complete cleanup of:	
Abandoned Indian Creek Outfall,	FY 1993
D27-Outside,	FY 1994
Outfall 001 Raceway, D26-Inside, Plating Building, and South Lagoon.	FY 1996

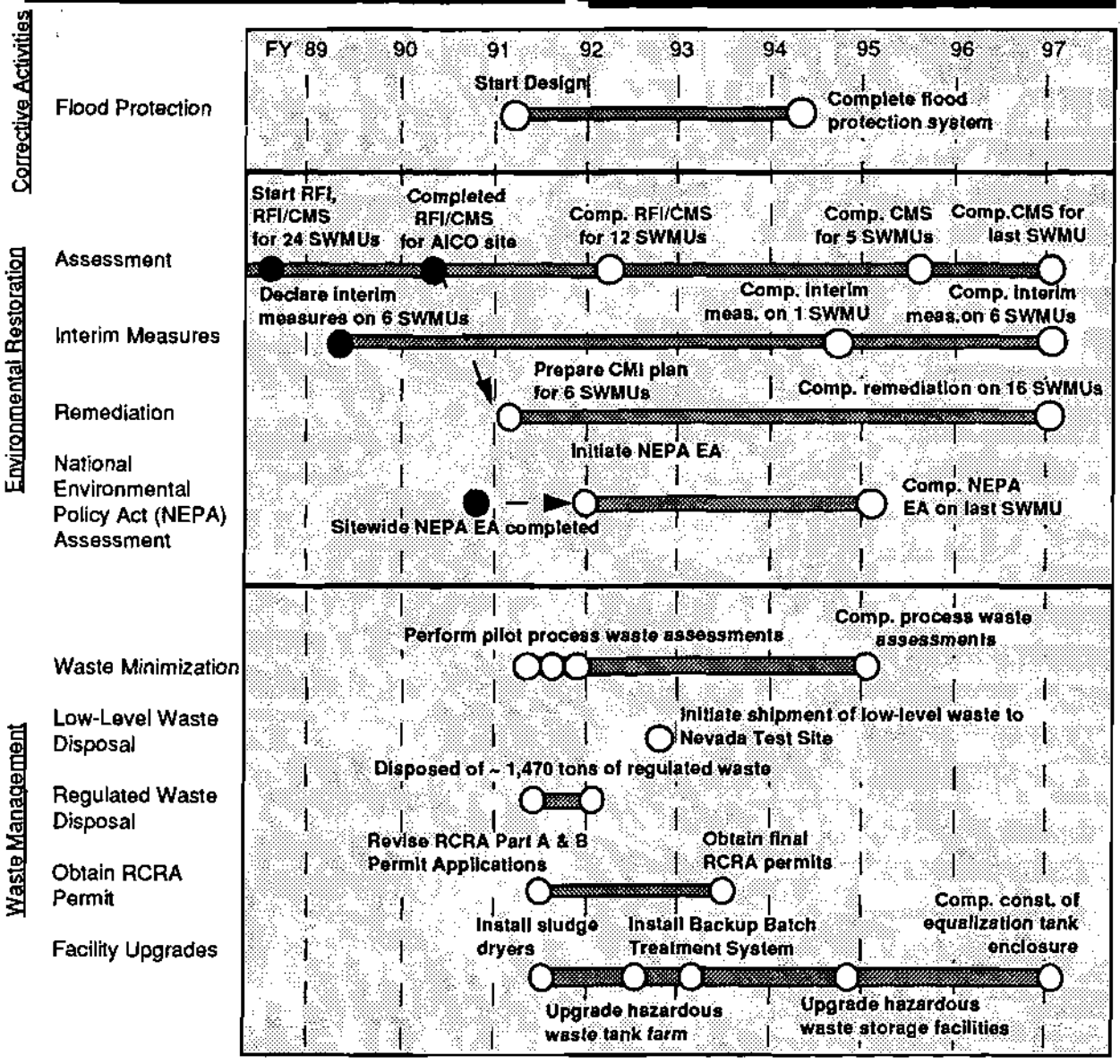
Technology Development

- Expect significant air emissions and waste reduction with the expansion of the KCP Environmentally Conscious Manufacturing initiatives such as solvent substitution.

Progress Chart for Albuquerque Field Office: Kansas City Plant*

Long-Term Objectives:
Clean up all solid waste management units (SWMUs) by FY 2000
Continue compliance with waste management regulations

Five-Year Objectives:
Complete remediation for six SWMUs
Complete assessment for all 24 SWMUs
Complete flood protection improvement
Upgrade waste management storage facilities



Legend

- ○ Planned Milestones
- ● Completed Milestones
- — — ► Information Flows
- ▬ Activities

Acronyms and Initialisms

AICO- Abandoned Indian Creek Outfall
CMI- Corrective Measures Implementation
EA- Environmental Assessment
CMS- Corrective Measures Study
RFI- RCRA Facility Investigation

* For Validated Target Level

STATUS/ACCOMPLISHMENTS

Corrective Activities

- Completed precious metals area upgrades in 1990.
- Completed design of flood protection system.
- Sliplined and grouted a portion of the storm sewer.
- Installed emission control equipment on painting exhausts.
- Completed design for repair and seal of hazardous waste storage facilities.
- Repaired and sealed hazardous waste storage lots.
- Completed rerouting of noncompliant drains from storm sewer system.

Waste Management

- Installed sludge dryers.
- Submitted a RCRA Part B Permit Applications to EPA.
- Initiated Pollution Prevention and Waste Minimization Program.
- Upgraded waste handling and storage facilities.
- Performed pilot process waste assessments.
- Disposed of 1,470 tons of regulated waste annually.

Environmental Restoration

- Completed Arsenic and Manganese Reports (FY 1990), two RFIs, two RFI/CMSs, and demolition/disposal of Plating Building and capped area; improved groundwater treatment capability.

Technology Development

- Successfully demonstrated, tested, and evaluated ultraviolet light/ozone groundwater treatment technology for use in the Environmental Restoration Program.
- Identified alternate cleaning processes and materials that significantly reduced air emissions and waste generation.

ISSUES

Corrective Activities

RCRA requires that hazardous wastes be protected from a 100-year flood. Additionally, Federal facilities must be protected from a 500-year flood as required by the Federal Emergency Management Agency. This level of protection does not currently exist at KCP. A major flood affecting this site could result in a loss of property, work stoppages, and environmental cleanup from the potential release of hazardous waste.

The State of Missouri's discharge limitations for Total Toxic Organics to receiving streams is stringent and aggressively enforced. The Missouri Water Quality Standard for the discharge of polychlorinated biphenyls is 0; therefore, compliance may be difficult.

Environmental Restoration

The primary issues encountered or anticipated include changing expectations for detail and technical comprehensiveness of deliverables by the regulatory agencies.

Funding: Validated Target Level ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	5,549	0	4,785	0	3,694	0	1,987	0	16,015
FY92	4,140	0	7,933	0	4,231	0	11,617	0	27,921
FY93	2,736	0	7,060	0	3,220	0	4,715	0	17,731
FY94	329	0	9,328	0	1,879	0	8,184	0	19,720
FY95	342	0	7,195	0	1,011	0	20,947	0	29,495
FY96	355	0	9,848	0	63	0	30,219	0	40,485
FY97	0	0	7,746	0	0	0	31,544	0	39,290
FY93-97	3,762	0	41,177	0	6,175	0	95,607	0	146,721

Funding: Preliminary Unvalidated Case ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	5,549	0	4,785	0	3,694	0	1,987	0	16,015
FY92	4,140	0	7,933	0	4,231	0	11,617	0	27,921
FY93	2,736	0	7,060	0	3,220	0	4,715	0	17,731
FY94	329	0	9,328	0	1,879	0	11,524	0	23,060
FY95	342	0	7,195	0	1,011	0	35,518	0	44,066
FY96	355	0	9,848	0	63	0	49,101	0	59,367
FY97	0	0	7,746	0	0	0	56,060	0	63,806
FY93-97	3,762	0	41,177	0	6,173	0	156,918	0	208,030

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.

ALBUQUERQUE FIELD OFFICE INSTALLATION SUMMARY LOS ALAMOS NATIONAL LABORATORY

FACILITY DESCRIPTION

The Los Alamos National Laboratory (LANL) occupies about 43 miles^2 in Los Alamos County, ~ 60 miles north of Albuquerque and 25 miles northwest of Santa Fe. The laboratory is situated on the Pajarito Plateau, which is made up of fingerlike mesas ranging in elevation from 6,200 to 7,800 ft. Major programs at LANL include applied research in nuclear and conventional weapons development, nuclear fission and fusion, nuclear safeguards and security, and waste management. Corrective Activities include those activities to bring active or standby facilities into compliance with ambient air, water, and solid waste regulations and/or agreements and DOE requirements. Waste management is responsible for managing the hazardous, mixed, and radioactive wastes generated by laboratory operations. Approximately 1,900 potential release sites, aggregated into 24 operable units, are currently scheduled for investigation in the Environmental Restoration (ER) program under the Hazardous and Solid Waste Amendments (HSWA) permit. Three surplus facilities are identified for decontamination and decommissioning (D&D) in the Five-Year Plan.

MAJOR MILESTONES

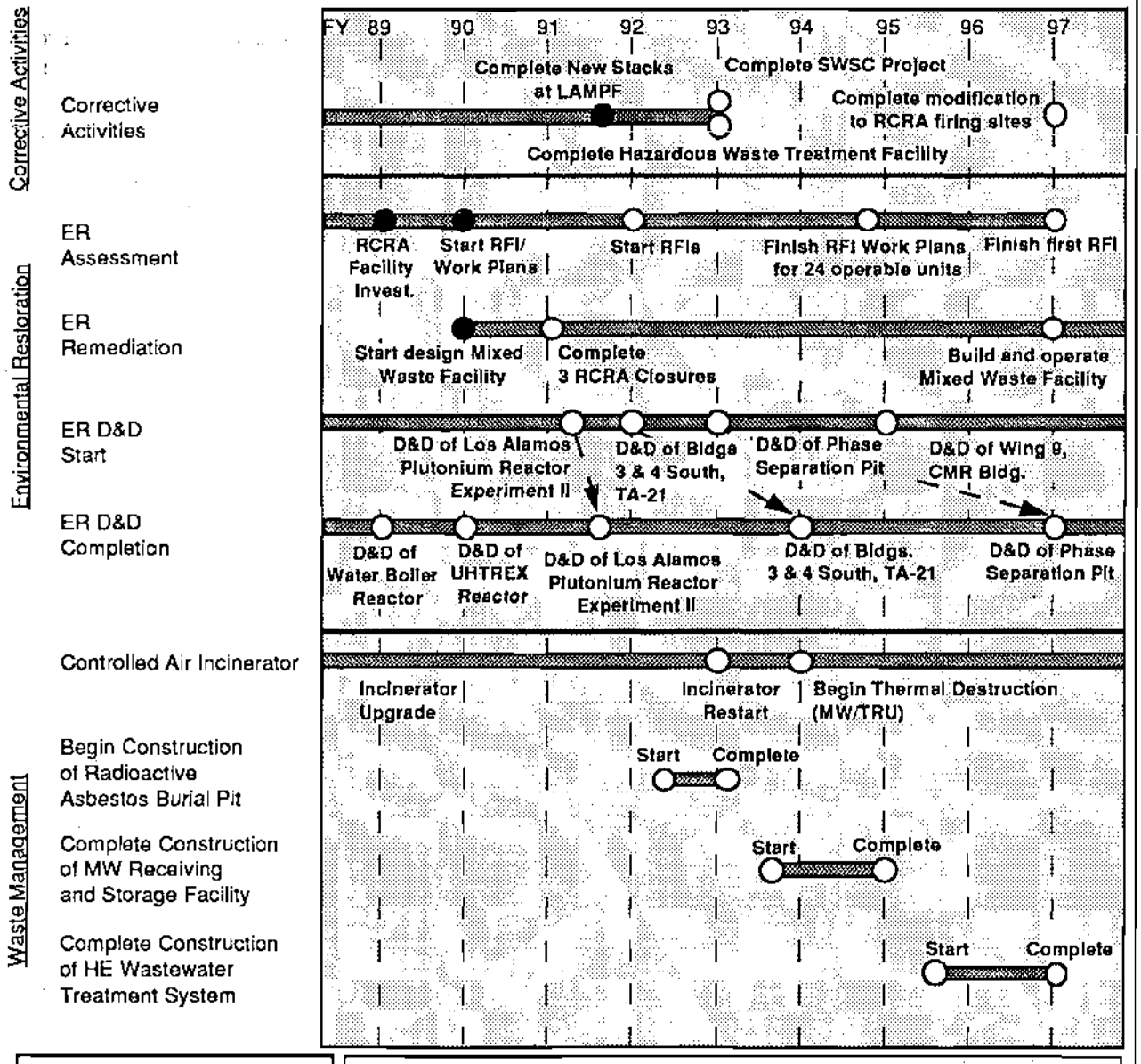
Corrective Activities	Date
• Complete construction of Hazardous Waste Treatment Facility.	FY 1993
• Complete construction of the Sanitary Wastewater Systems Consolidation.	FY 1993
• Complete modifications to RCRA firing sites.	FY 1997
Waste Management	
• Complete construction of hazardous waste oil storage facility.	FY 1992
• Complete construction of radioactive Asbestos Burial Pit.	FY 1993
• Restart the Controlled Air Incinerator.	FY 1993
• Begin construction of Mixed Waste Receiving and Storage Facility.	FY 1993
• Complete Title I Design of Low-Level and Mixed Waste Incineration Facility.	FY 1994
• Complete construction of polychlorinated biphenyl (PCB) handling and storage facility.	FY 1994
• Complete construction of High Explosive (HE) Wastewater Treatment System.	FY 1997
Environmental Restoration	
• Complete ten RCRA Facility Investigation/RCRA Corrective Measures Studies.	FY 1992*
• Develop D&D Master Plan.	FY 1992
• Complete five RCRA Facility Investigation/RCRA Corrective Measures Studies.	FY 1993*
• Complete D&D of Bldgs. 3 and 4 South at Technical Area 21.	FY 1993
• Complete D&D of Phase Separator Pit at Technical Area 35.	FY 1996*

* Completion year dependent on funding

Progress Chart for Albuquerque Field Office: Los Alamos National Laboratory*

Long-Term Objectives:
- Bring active and standby facilities into compliance with air, water, and solid waste regulations
- Complete RFI/CMS for all operable units by FY 2002
- Clean up all operable units by FY 2020
- Achieve significant reduction in waste generation
- Decommission all identified surplus buildings by FY 2020

Five-Year Objectives:
- Complete all RFI plans and begin all RFIs by FY 1995
- Complete characterization of all waste streams
- Complete three RCRA closures by 1992
- Construct additional waste treatment, storage, and disposal facilities to handle waste from current operations and cleanup of operable units
- Decommission 90 percent of identified surplus building



Legend
- Planned Milestones
- Completed Milestones
- Information Flows
- Activities

Acronyms and Initialisms

CMR-	Chemical Metallurgy Research	RFI-	RCRA Facility Investigation
CMS-	Corrective Measures Study	SWSC-	Sanitary Wastewater Systems Consolidations
CWA-	Clean Water Act	TA-	Technical Area
LAMPF-	Los Alamos Meson Physics Facility	TRU-	Transuranic Waste
LLW-	Low-Level Waste	UHTREX-	Ultra-High Temperature Reactor Experiment
MW-	Mixed Waste		

*** For Validated Target Level**

STATUS/ACCOMPLISHMENTS

Corrective Activities

- Completed conceptual design and/or preliminary design for the following: Hazardous Waste Treatment Facility, Sanitary Wastewater System Consolidation, LAMPF stacks, septic tank replacements, and upgrade of six Control and Countermeasures Programs.
- Installed spill control structures at 15 sites.
- Replaced 40 PCB transformers and 100 capacitors; 20 PCB transformers are being retrofilled.
- Removed 40 underground storage tanks (USTs) and installed two major new aboveground tanks.

Waste Management

- Completed Preconceptual Design of the following: Low-Level Waste/MW Incinerator, HE Wastewater Treatment System, and Radioactive Liquid Waste Treatment Facility.
- Developed and implemented Waste Minimization Program and Waste Generator Education and Training.
- Processed 1,500 compressed gas cylinders.
- Continued upgrades to Controlled Air Incinerator.
- Shipped about 1,000 m^3 of hazardous waste for commercial incineration offsite.
- Increased radioactive/mixed waste storage capacity.

Environmental Restoration

- Identified ~1,900 Potential Release Sites from the 1990 Solid Waste Management Unit Report.
- Submitted Installation Work Plan for Conducting Environmental Restoration to the regulators in November 1990.
- Removed six USTs in 1990.
- Compiled the RFI Work Plan for one operable unit.
- Under D&D, one reactor project nearing completion and another reactor in progress.

ISSUES

Corrective Activities resolve the risk of PCB leaks or spills, contamination from the constituents of HE's, spills of hazardous and/or radioactive materials, and impaired air and water quality. This mitigates near-term adverse impacts to personnel and the public by reducing exposure to these wastes with potential health risks and potential contamination to the environment. Adequate support will enable LANL to meet regulatory requirements. The risk associated with the environmental restoration of waste sites at LANL cannot be quantified until a major portion of the waste characterization work is completed. No immediate risks have been identified to date. Support is needed for LANL to meet its hazardous waste (RCRA) permit conditions.

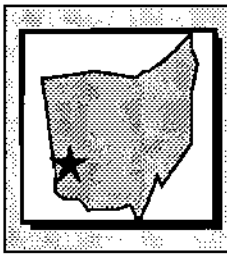
Funding: Validated Target Level ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	12,746	0	26,919	0	20,479	0	2,429	0	62,573
FY92	16,060	3,505	58,834	0	54,691	0	8,264	0	141,354
FY93	10,380	0	68,441	0	65,710	1,082	6,891	870	153,374
FY94	3,272	0	103,006	0	91,607	416	4,349	873	203,523
FY95	2,290	0	113,051	0	87,521	329	7,390	0	210,581
FY96	1,899	0	122,705	0	95,659	427	2,845	3,193	226,728
FY97	1,938	0	133,450	0	92,971	63	2,203	0	230,625
FY93-97	19,779	0	540,653	0	433,468	2,317	23,678	4,936	1,024,831

Funding: Preliminary Unvalidated Case ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	12,746	0	26,919	0	20,479	0	2,429	0	62,573
FY92	16,060	3,505	58,834	0	54,691	0	8,264	0	141,354
FY93	10,380	0	74,256	0	85,544	1,082	8,188	1,202	180,652
FY94	3,272	0	95,835	0	122,559	416	19,238	1,819	243,139
FY95	2,290	0	155,619	0	141,887	638	25,451	845	326,730
FY96	1,899	0	144,199	0	146,561	114	4,376	6,951	304,100
FY97	1,938	0	96,815	0	151,067	114	3,577	0	253,511
FY93-97	19,779	0	566,724	0	647,618	2,364	60,830	10,817	1,308,132

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.



ALBUQUERQUE FIELD OFFICE INSTALLATION SUMMARY MOUND PLANT

FACILITY DESCRIPTION

Mound is located within the southern city limits of Miamisburg in southwestern Ohio. The plant site occupies 306 acres of land overlooking the Miamisburg and Great Miami River. The Dayton metropolitan area is located 10 miles northeast of the installation. Mound is an integrated research, development, and production facility operated by EG&G Mound Applied Technologies of DOE weapons and energy programs. Mound mainly manufactures nonnuclear and tritium-containing components for nuclear weapons. Operations at Mound generate sanitary, hazardous, radioactive, and mixed wastes. Mound's Environmental Restoration (ER) Program includes a CERCLA cleanup program and decontamination and decommissioning (D&D) activities. A Federal Facilities Agreement was successfully negotiated with EPA in August 1990.

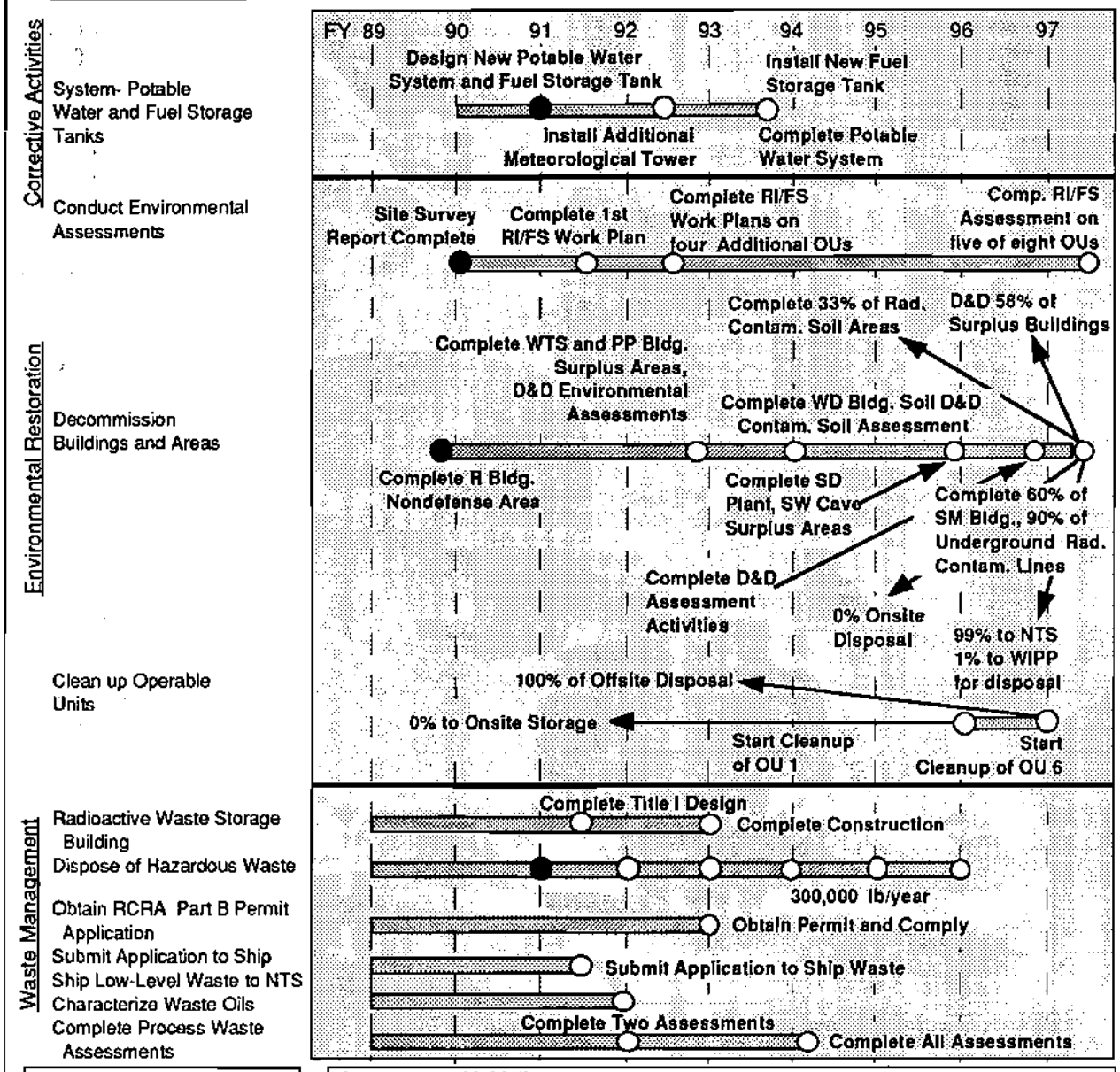
MAJOR MILESTONES

Corrective Activities	Date
• Construct a Fuel Oil Storage Facility.	FY 1992
• Complete installation of meteorological tower.	FY 1992
• Complete the Potable Water System Upgrade.	FY 1993
Waste Management	
• Obtain RCRA Part B Permit Application.	FY 1992
• Complete Glass Melter Trial Burn.	FY 1992
• Complete construction of a Radioactive Waste Storage Building.	FY 1993
• Complete offsite disposal of radioactive polychlorinated biphenyl waste.	FY 1994
• Complete process waste assessments.	FY 1994
Environmental Restoration	
• Complete decommissioning of Waste Transfer System.	FY 1992
• Complete decommissioning of Plutonium Processing Building.	FY 1992
• Complete assessment of underground lines to Waste Disposal Building.	FY 1992
• Complete Remedial Investigation/Feasibility Study (RI/FS) Work Plans on four operable units (OUs).	FY 1992
• Complete decommissioning of Waste Disposal Building radioactive-contaminated soil.	FY 1993
• Complete assessment of Contaminated Soil Areas.	FY 1993
• Complete decommissioning of Sanitary Disposal Plant.	FY 1995
• Complete decommissioning of Semi-Works Building Cave Area.	FY 1995
• Complete assessment of Building 21.	FY 1995
• Begin cleanup on OU 1.	FY 1995
• Complete decommissioning of Special Metallurgical Building.	FY 1997
• Complete decommissioning of underground lines to Waste Disposal Building.	FY 1997
• Complete 33 percent of currently known radioactive-contaminated soil areas decommissioning.	FY 1997
• Complete 58 percent of currently known surplus buildings decommissioning.	FY 1997
• Complete RI/FS assessments on five of eight OUs.	FY 1997

Progress Chart for Albuquerque Field Office: Mound Plant*

Long-Term Objectives:
- Clean up OUs by FY 2010
- Decommission currently known surplus buildings by FY 2003
- Have disposal process in place for all waste streams by FY 2008

Five-Year Objectives:
- Complete RI/FS on five of eight OUs
- Decommission 58% of surplus buildings
- Start cleanup on two OUs
- Constuct additional waste storage and Incinerator to handle waste from current operations and cleanup of OUs



Legend
- Planned Milestones
- Completed Milestones
- Material Flows
- Activities

Acronyms and Initialisms

NTS	Nevada Test Site
Rad	Radioactive
SD	Sanitary Disposal
PP Bldg	Plutonium Processing Building
R Bldg	Research Building
SM bldg	Special Metallurgical Building
SW Bldg	Semi Works Building
WD Bldg	Waste Disposal Building
WIPP	Waste Isolation Pilot Plant
WTS	Waste Transfer System

* For Validated Target Level

STATUS/ACCOMPLISHMENTS

Corrective Activities

- Begin installing meteorological tower in FY 1992.
- Begin construction of fuel storage system and new drinking water system in FY 1993.

Waste Management

- Implemented waste minimization program to reduce the volume of waste generated and increase recycling.
- Completed Title I design of the Radioactive Waste Storage Building.
- Submitted the permit application to ship waste to NTS.
- Characterized about 1,000 ft^3 waste oils.
- Completed two process waste assessments.
- Estimated disposal of hazardous waste at 300,000 lb/year.

Environmental Restoration

- Completed installation preliminary assessment in 1987.
- Completed Mound Site Survey Report in 1988.
- Conducted initial screening of seeps and pits in 1988.
- Initiated RI/FS for all OUs.
- Completed decommissioning of surplus nondefense areas in R Building in FY 1990 and returned for reuse by DOE.

ISSUES

- No immediate health risks have been identified to date; however, steps must be taken to prevent offsite contamination of groundwater. Volatile organic compounds are a primary concern.
- Health risks of CERCLA sites at Mound cannot be quantified until a major portion of the characterization work associated with the RI is completed.
- Failure of the fuel storage tank could decrease Mound's ability to prevent potential health and environmental concerns.
- Drinking water for employees could be contaminated due to existing cross connections between the service, potable, and fire protection water systems.
- Additional meteorological tower allows for adequate characterization of an accidental airborne release.

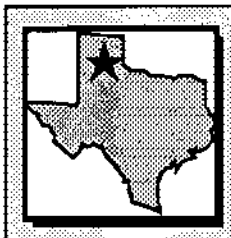
Funding: Validated Target Level ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	1,755	0	4,680	0	12,946	0	12,020	0	31,401
FY92	41	0	8,396	0	17,157	456	18,611	954	45,615
FY93	0	0	9,629	0	6,838	42	20,261	1,023	37,793
FY94	0	0	11,696	0	7,854	0	15,975	1,346	36,871
FY95	0	0	15,297	0	13,157	0	13,781	299	42,534
FY96	0	0	12,269	0	13,114	0	23,625	0	49,008
FY97	0	0	9,039	0	4,885	0	28,469	0	42,393
FY93-97	0	0	57,930	0	45,848	42	102,111	2,668	208,599

Funding: Preliminary Unvalidated Case ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	1,755	0	4,680	0	12,946	0	12,020	0	31,401
FY92	41	0	8,396	0	17,157	456	18,611	954	45,615
FY93	0	0	9,629	0	17,901	42	16,594	1,356	45,522
FY94	0	0	11,696	0	10,477	0	23,664	1,348	47,185
FY95	0	0	15,297	0	7,479	0	27,746	300	50,822
FY96	0	0	12,269	0	5,562	0	55,402	0	73,233
FY97	0	0	9,039	0	3,724	0	54,736	0	67,499
FY93-97	0	0	57,930	0	45,143	42	178,142	3,004	284,261

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.



ALBUQUERQUE FIELD OFFICE INSTALLATION SUMMARY PANTEX PLANT

FACILITY DESCRIPTION

Pantex is located in the panhandle of Texas, about 17 miles northeast of downtown Amarillo and 10 miles west of the town of Panhandle. Pantex includes a total land area of about 16,000 acres. The total population within a 50-mile radius of the plant was 259,300 in 1980. The plant is operated to meet DOE's responsibilities for nuclear weapons assembly, stockpile monitoring, maintenance, modifications, and retirements (disassembly). Pantex conducts research and development on high explosives in support of weapons design and development and production engineering for DOE. Approximately 100 potential release sites have been identified at Pantex for investigation. Corrective Activities were conducted beginning in FY 1990 under the terms of a RCRA Section 3008(h) Corrective Action Order of Consent.

MAJOR MILESTONES

Corrective Activities	Date
• Complete replacement of underground storage tanks (USTs).	4Q FY 1992

Waste Management	
• Complete design and closure of Hazardous Waste Unit 11-44.	4Q FY 1992
• Award contract for construction of high-explosive wastewater recycle system.	4Q FY 1993
• Complete construction of burn cage for high explosives.	4Q FY 1994
• Begin design of High-Explosive Incinerator.	FY 1995
• Complete construction of mixed waste storage facilities.	1Q FY 1996

Environmental Restoration	
• Initiate Interim Corrective Measures.	4Q FY 1992
• Begin design for remediation of waste sites.	2Q FY 1993
• Complete field investigation of six sites.	2Q FY 1994
• Begin remediation construction.	4Q FY 1994
• Begin Corrective Measures Study plan and Configuration Management (CM) on five Solid Waste Management Unit (SWMU) groups.	FY 1994-1997
• Begin CM construction on three SWMU groups.	FY 1994-1997
• Complete CM construction and documents on one SWMU group.	FY 1994-1997
• Begin Interim Corrective Measures for seven SWMU groups.	FY 1994-1997

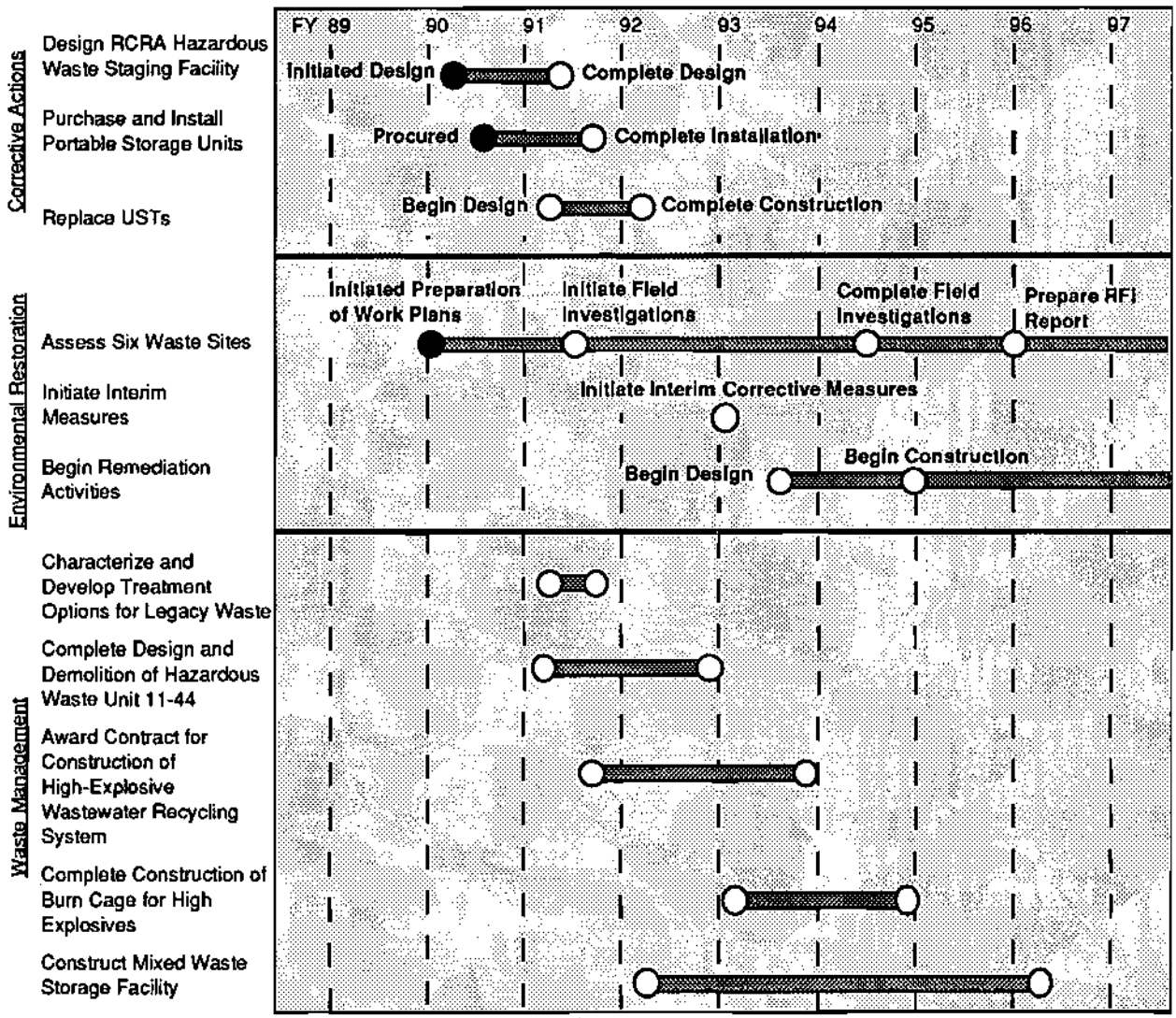
Progress Chart for Albuquerque Field Office: Pantex Plant*

Long-Term Objectives:

Complete assessment and remediation of all historic waste sites
Upgrade waste management program
Establish onsite treatment options
Design waste minimization into processes

Five-Year Objectives:

Complete all known corrective actions before FY 1993
Identify waste minimization and treatment options
Monitor to verify regulatory compliance
Track all chemicals
Incorporate quality assurance concepts in waste management procedures



Legend

- ○ Planned Milestones
- ● Completed Milestones
- ▬ Activities

Acronym and Initialisms

RFI- RCRA Facility Investigation

*** For Validated Target Level**

STATUS/ACCOMPLISHMENTS

Corrective Activities

- Complete Architectural and Engineering design of Environment, Safety, and Health staging facility in 1991.
- Initiated design of RCRA Waste and Hazardous Waste Staging Facilities in April 1990.
- Initiated design of UST replacements in December 1990.
- Procured interim storage units in August 1990.
- Purchased and installed portable storage units in 1991.

Waste Management

- Waste Minimization Plan has been completed.
- Waste Analysis Certification and Tracking Plans have been completed.
- Shipments of hazardous waste for offsite disposal are continuing.
- Waste management procedures are to be completely revised in FY 1991.

Environmental Restoration

- RCRA Corrective Action Order of Consent [Section 3008(h)] has been executed and is being implemented; all environmental restoration activities are in compliance with this Order.
- Work plans for eight SWMU groups are being completed, and regulatory reviews are being performed.
- Assessments of six waste sites were initiated in April 1991.

ISSUES

Based on the information available, no immediate health risks have been identified. Very little is known about the type and extent of subsurface contamination. No offsite contamination resulting from past activities has been identified. Onsite wells, installed in FY 1990, between the former chemical burn pit and the Amarillo/Pantex water supply for monitoring water from Ogallala aquifer have been contaminated. The extent of onsite contamination is unknown because of the lack of monitoring wells in Zone 12. For example, migration of contaminants, lead, and other land disposal restricted (LDR) materials from these sites to the Ogallala aquifer is possible. Pantex contains some classified waste that is contaminated with lead or other LDR materials. Cleanup costs for the accidental tritium release that occurred during the summer of FY 1989 have been included in current base program costs.

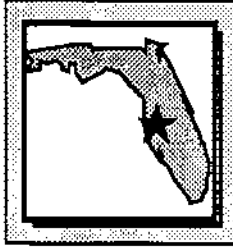
Funding: Validated Target Level ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	500	0	9,200	0	10,368	0	0	0	20,068
FY92	0	0	19,368	0	10,456	0	400	0	30,224
FY93	0	0	16,800	0	13,607	0	4,695	0	35,102
FY94	0	0	14,942	0	6,571	0	4,955	0	26,468
FY95	0	0	24,813	0	3,411	0	5,450	0	33,674
FY96	0	0	24,975	0	2,291	0	3,563	0	30,829
FY97	0	0	17,316	0	2,011	0	6,088	0	25,415
FY93-97	0	0	98,846	0	27,891	0	24,751	0	151,488

Funding: Preliminary Unvalidated Case ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	500	0	9,200	0	10,368	0	0	0	20,068
FY92	0	0	19,368	0	10,456	0	400	0	30,224
FY93	0	0	16,800	0	24,355	0	4,695	0	45,850
FY94	0	0	14,942	0	10,385	0	4,955	0	30,282
FY95	0	0	24,813	0	5,715	0	8,586	0	39,114
FY96	0	0	24,975	0	2,783	0	6,142	0	33,900
FY97	0	0	17,316	0	2,083	0	11,085	0	30,484
FY93-97	0	0	98,846	0	45,321	0	35,463	0	179,630

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.



ALBUQUERQUE FIELD OFFICE INSTALLATION SUMMARY PINELLAS PLANT

FACILITY DESCRIPTION

The Pinellas Plant is located on a 99.2-acre site about 6 miles north of St. Petersburg in Pinellas County, Florida. Pinellas County is on a peninsula bordered on the west by the Gulf of Mexico and on the east and south by Tampa Bay. The 1989 census estimated a population of 870,162 in Pinellas County. Key activities at the Pinellas Plant include design, development, and production of special electronic and mechancial equipment for nuclear weapons applications. Such specialized products include neutron generators, specialty capacitors, thermal batteries, crystal resonators, oscillators, and clocks.

MAJOR MILESTONES

Waste Management

	Date
All Waste Management Operations at the Pinellas Plant are ongoing operations as part of the base program.	
• Complete construction of Neutralization Facility Upgrade.	FY 1992
• Complete construction of 90-day storage facility.	FY 1992

Environmental Restoration

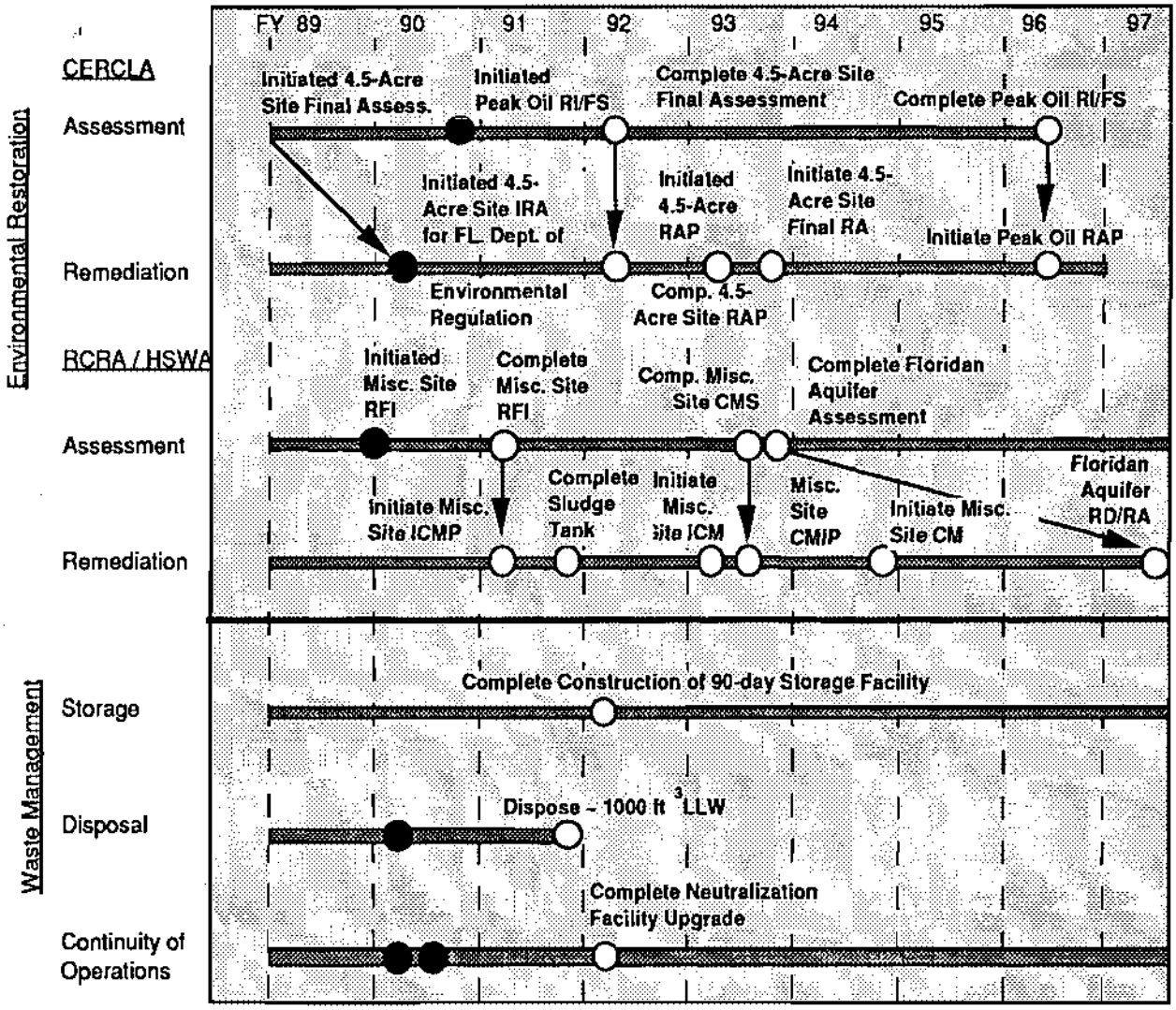
Environmental restoration at the Pinellas Plant consists of a potentially responsible party involvement in the Peak Oil site, a State-led remediation of the 4.5-acre site, a RCRA closure of a hazardous waste holding tank, and the assessment and cleanup of 15 solid waste management units under the Hazardous and Solid Waste Amendments (HSWA) permit. Other activities include the assessment and remediation of the Floridan Aquifer and project management of all remediation activities.

• Complete Floridan Aquifier Assessment.	FY 1991
• Complete 4.5-Acre Site Final Assessment.	FY 1992
• Initiate 4.5-Acre Site Remedial Action (RA)/Remedial Design.	FY 1993
• Miscellaneous sites interim Corrective Measures Implementation.	FY 1993

Progress Chart for Albuquerque Field Office: Pinellas Plant*

Long-Term Objectives:
Complete 4.5-Acre site remediation in FY 2001
Complete miscellaneous site remediation in FY 2014
Complete Peak Oil site remedial action plan
Initiate Peak Oil site remedial design/action
Complete Floridan Aquifer remediation

Five-Year Objectives:
Fully characterize all sites
Complete interim remedial action of 85 percent of sites by FY 1998
Initiate remedial action of 65 percent of sites by FY 1998
Complete all source remediation action by FY 1998



Legend

- ○ Planned Milestones
- ● Completed Milestones
- → Material Flows
- ▬ Activities

Acronyms and Initialisms

CMIP	Corrective Measures Implementation Plan
CMS	Corrective Measures Study
ICM	Interim Corrective Measures
IRA	Interim Remedial Action
LLW	Low-Level Waste
RAP	Remedial Action Plan
RI/FS	Remedial Investigation/Feasibility Study
RFI	RCRA Facility Investigation

* For Validated Target Level

STATUS/ACCOMPLISHMENTS

Waste Management

- Disposed of approximately 1,000 ft^3 of LLW in 1991.
- Dispose of up to 5000 ft^3 of LLW per year after 1991.
- Completed the conceptual design on a container storage facility, an FY 1990 capital project.
- Initiated trim coolant treatment system.
- Removed two underground tanks and remediated the soil.

Environmental Restoration

- Established groundwater monitoring program for the 4.5-acre site in May 1990.
- Completed Phase I draft RCRA Facility Investigation Work Plan on 15 Solid Waste Management Units (SWMUs) listed on EPA Region IV HSWA Permit.
- Completed iron removal pretreatment study on the 4.5-acre site in December 1990.
- Continued interim RA Plan for groundwater remediation at 4.5-acre site.
- Controlled and minimized offsite migration of contaminants successfully.
- Delayed completion of a sludge holding tank closure scheduled for December 1989 because of additional assessment/remediation needs.
- Scheduled SWMU Interim Corrective Measures Plan to be completed in 1991.

ISSUES

Environmental Restoration

No immediate health risks have been identified based on information available to date; the risks cannot be quantified until a major portion of the characterization work associated with the RFI is complete.

Funding: Validated Target Level ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	0	1,558	0	2,051	0	1,167	0	4,776
FY92	0	0	1,567	0	2,022	0	1,018	0	4,607
FY93	0	0	2,572	0	712	0	5,188	0	8,472
FY94	0	0	2,665	0	333	0	18,512	0	21,510
FY95	0	0	2,771	0	377	0	3,861	0	7,009
FY96	0	0	2,881	0	266	0	4,377	0	7,524
FY97	0	0	2,996	0	257	0	4,431	0	7,684
FY93-97	0	0	13,885	0	1,945	0	36,369	0	52,199

Funding: Preliminary Unvalidated Case ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	0	1,558	0	2,051	0	1,167	0	4,776
FY92	0	0	1,567	0	2,022	0	1,018	0	4,607
FY93	0	0	2,572	0	951	0	9,910	0	13,433
FY94	0	0	2,665	0	473	0	28,957	0	32,095
FY95	0	0	2,771	0	318	0	7,225	0	10,314
FY96	0	0	2,881	0	333	0	8,870	0	12,084
FY97	0	0	2,996	0	322	0	9,459	0	12,777
FY93-97	0	0	13,885	0	2,397	0	64,421	0	80,703

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.

ALBUQUERQUE FIELD OFFICE
INSTALLATION SUMMARY
SANDIA NATIONAL LABORATORY - ALBUQUERQUE

FACILITY DESCRIPTION

Sandia National Laboratory, Albuquerque (SNLA) is a research and development (R&D) facility that primarily develops, engineers, and tests nonnuclear components of nuclear weapons. SNLA's other areas of R&D include arms control, energy, the environment, and other areas of strategic importance to U.S. security. SNLA occupies several parcels of land covering 2,820 acres within Kirtland Air Force Base, directly south of Albuquerque, New Mexico. SNLA is also responsible for two offsite test areas: the Tonopah Test Range (TTR) and the Kauai Test Facility (KTF). TTR is located in Nevada and covers 640 miles^2. KTF is located on the Island of Kauai within the Navy's Pacific Missile Range.

MAJOR MILESTONES

Corrective Activities	Date
• Complete assessment of air emission impacts.	3Q FY 1992
• Design and begin initial installation of air pollution control monitoring devices.	4Q FY 1992

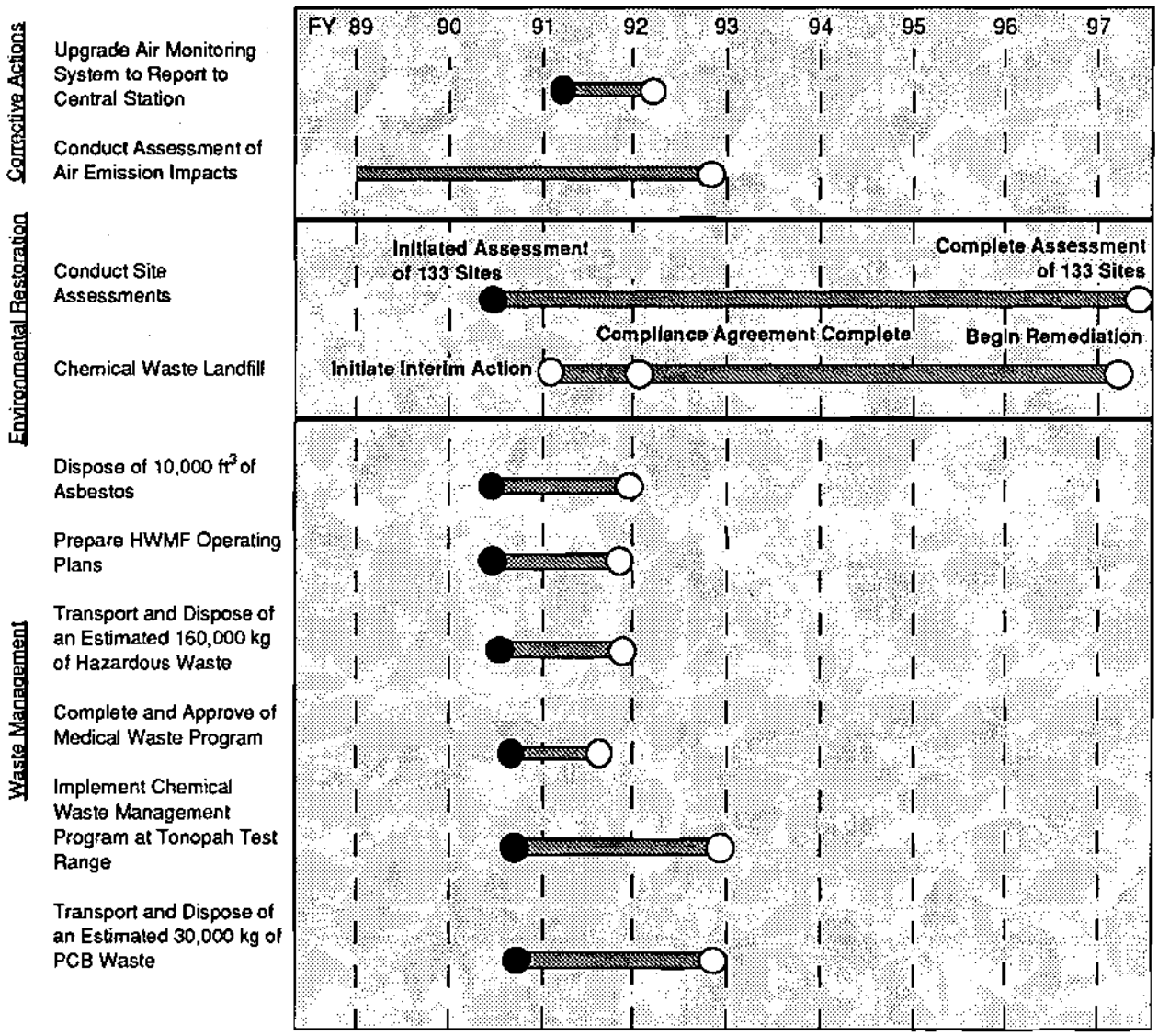
Waste Management	
• Complete design and construction of radioactive and mixed waste management facility upgrades.	4Q FY 1991
• Dispose of an estimated 10,000 ft^3 of asbestos.	4Q FY 1991
• Complete Hazardous Waste Management Facility (HWMF) Operating Plans and Procedures.	4Q FY 1991
• Transport and dispose of an estimated 160,000 kg of hazardous waste.	4Q FY 1991
• Implementation of SNLA chemical waste management program at TTR.	4Q FY 1992
• Transport and dispose of an estimated 30,000 kg of polychlorinated biphenyl waste.	4Q FY 1992
• Implement upgraded employee training data base.	4Q FY 1992
• Complete design and begin construction of waste assay facility.	4Q FY 1992

Environmental Restoration	
• Continue interim cleanup of the Chemical Waste Landfill.	2Q FY 1997
• Begin remediation of the Chemical Waste Landfill.	2Q FY 1997
• Conduct assessments at 133 sites.	4Q FY 1997

Progress Chart for
Albuquerque Field Office: Sandia National Laboratory, Albuquerque*

Long-Term Objectives:
Construct a Waste Oil Handling Facility in FY 2000
Design and Construct a Waste Examination, Reduction, and Packaging Facility by FY 2000

Five-Year Objectives:
Initiate Assessment of 133 ER Sites by FY 1997
Dispose of Accumulated Asbestos, Hazardous Waste, and PCB Waste



Legend

- ○ Planned Milestones
- ● Completed Milestones
- ▬ Activities

Acronyms and Initialisms

HWMF- Hazardous Waste Management Facility
PCB- polychlorinated biphenyl

* For Validated Target Level

STATUS/ACCOMPLISHMENTS

Corrective Activities

- Monitoring System will be upgraded to report to Central Station in September 1991.
- Construction of the TA III sewer line was completed.

Waste Management

- RCRA Part A Permit Application for mixed wastes was submitted to the State of New Mexico in August 1990.
- Completion and approval of the Sandia National Laboratory Medical Waste Program is expected in June 1991.
- Waste Minimization Program Plan was completed.
- The chemical exchange program resulted in $35,694 savings in FY 1990.

Environmental Restoration

- Monitoring well networks were installed at two shallow land burial sites.
- Trichloroethylene was found in the groundwater 500 ft beneath the Chemical Waste Landfill.
- The requirements of the original provisions of the Compliance Agreement at the Chemical Waste Landfill were completed.
- Interim cleanup measure at the Chemical Waste Landfill was initiated.
- Assessment activities were initiated at several other sites.

ISSUES

Mixed waste treatment, storage, and disposal sites, and classified hazardous treatment facilities need to be identified for current and legacy waste. With the State of New Mexico receiving regulatory authority for mixed waste in July 1990, the need for State agreements may occur if mixed waste treatment and disposal options are not found.

The majority of SNLA's Environmental Restoration (ER) Program is driven by the corrective action requirements of the RCRA Part B Operating Permit and the New Mexico underground storage tank laws. At the remaining sites, the program is driven by State law or by the requirements for the Comprehensive Environmental Response, Compensation, and Liability Act non-National Priorities List Sites.

No immediate health risks have been identified based on the information available; however, the risks associated with the ER sites cannot be quantified until a major portion of the characterization efforts are completed. Gas phase transport of solvents is now recognized as an important factor in contaminant movement at SNLA.

Funding: Validated Target Level ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	20	0	9,137	0	4,530	0	1,500	0	15,187
FY92	3,308	0	17,837	0	10,572	0	2,510	0	34,227
FY93	2,240	0	16,050	0	15,964	0	15	0	34,269
FY94	0	0	16,156	0	11,359	0	16	0	27,531
FY95	0	0	20,085	0	27,562	0	15	0	47,662
FY96	0	0	27,789	0	15,963	0	16	0	43,768
FY97	0	0	43,398	0	34,362	0	194	0	77,954
FY93-97	2,240	0	123,478	0	105,210	0	256	0	231,184

Funding: Preliminary Unvalidated Case ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	20	0	9,137	0	4,530	0	1,500	0	15,187
FY92	3,308	0	17,837	0	10,572	0	2,510	0	34,227
FY93	2,240	0	16,050	0	35,451	0	15	0	53,756
FY94	0	0	16,156	0	22,777	0	16	0	38,949
FY95	0	0	20,085	0	66,632	0	15	0	86,732
FY96	0	0	27,789	0	36,398	0	15	0	64,202
FY97	0	0	43,618	0	27,437	0	56,580	0	127,635
FY93-97	2,240	0	123,698	0	188,695	0	56,641	0	371,274

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.

ALBUQUERQUE FIELD OFFICE
INSTALLATION SUMMARY
SANDIA NATIONAL LABORATORIES - LIVERMORE

FACILITY DESCRIPTION

Sandia National Laboratories at Livermore (SNLL) lies about 40 miles east of San Francisco in the Livermore Valley, approximately 3 miles east of the Livermore city center. SNLL occupies about 413 acres of land, only a few blocks from the edge of the city of Livermore. In 1988, the population within 50 miles was estimated at nearly 6,000,000. SNLL consists of research and development (R&D) laboratories dedicated to the design and testing of nonnuclear components for nuclear weapons systems. A significant fraction of R&D at SNLL is devoted to energy-related programs in the Combustion Research Facility.

MAJOR MILESTONES

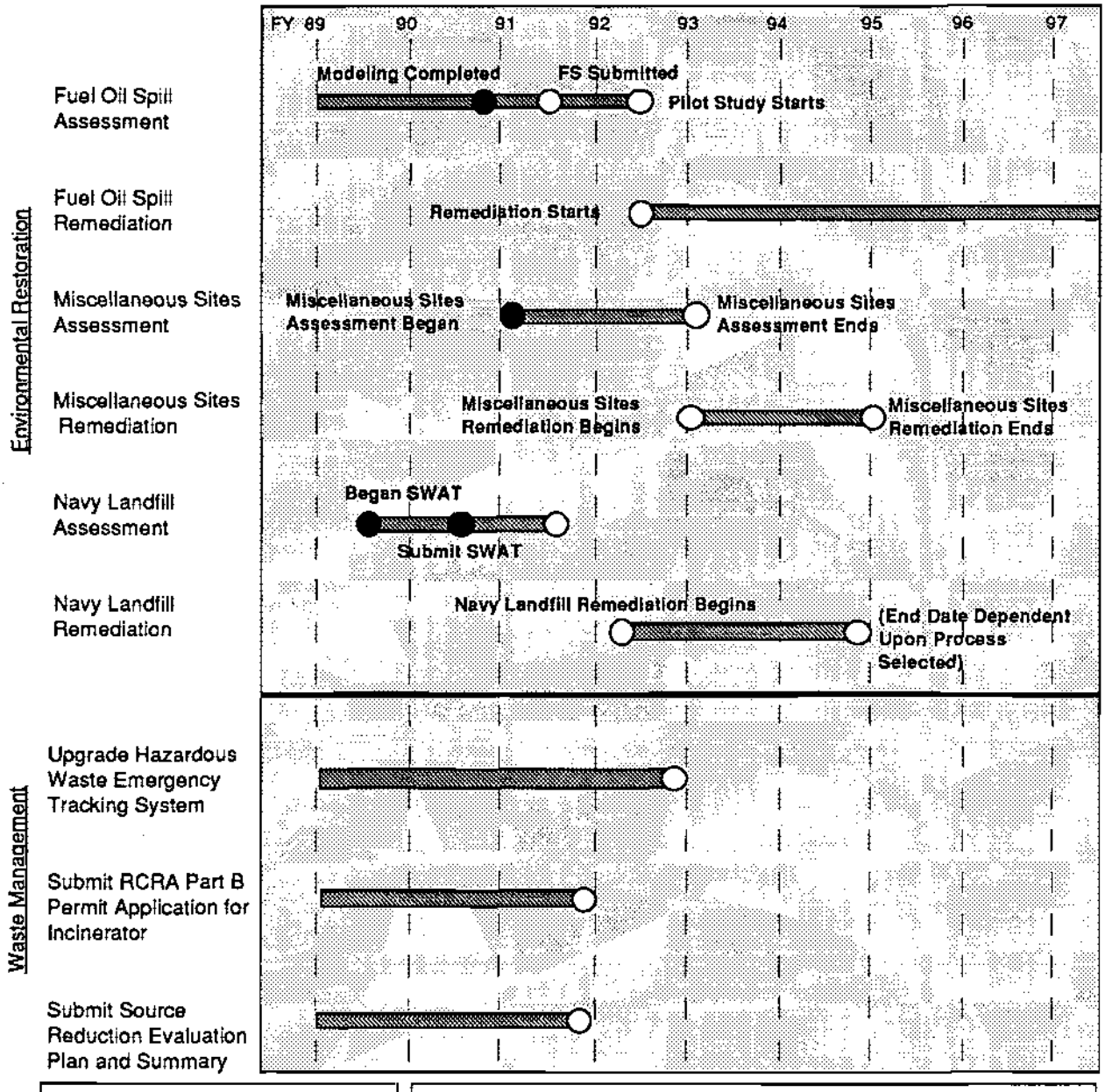
Waste Management	Date
• Submit Source Reduction Evaluation Plan and Summary to California Department of Health Services.	FY 1991
• Determine regulatory status of solid waste incinerator	FY 1991
• Upgrade Hazardous Waste Emergency Tracking System.	FY 1992

Environmental Restoration	
• Complete Fuel Oil Spill Pilot Study Remediation Study.	FY 1992
• Complete Navy Landfill RCRA Feasibility Study.	FY 1992
• Complete Bioremediation Work Plan.	FY 1993
• Begin implementation of bioremediation.	FY 1993
• Prepare Navy Landfill Remedial Action Work Plan.	FY 1993
• Prepare Remedial Alternatives Report.	FY 1993
• Submit Miscellaneous Site Remedial Investigation Report.	FY 1993
• Submit Miscellaneous Site Feasibility Study Report.	FY 1995

Progress Chart for
Albuquerque Field Office: Sandia National Laboratories - Livermore *

Long-Term Objectives:
Have disposal process in place for all waste steams by FY 2005
Complete all cleanup activities by FY 2000

Five-Year Objectives:
Complete miscellaneous sites remediation
Complete Navy Landfill remediation



Legend

- ○ Planned Milestones
- ● Completed Milestones
- ▬ Activities

Acronyms and Initialisms

FS- Feasibility Study
SWAT- State of California Solid Waste Assessment Test Program

*** For Validated Target Level**

STATUS/ACCOMPLISHMENTS

Corrective Activities

- A team has been formed to design replacement monitors for the Tritium Research Laboratory.
- A survey of potential suppliers to fabricate tritium monitors is planned; some specification work has been performed and will be completed in June 1991.

Waste Management

- The Spill Prevention Control and Countermeasures Plan was updated in FY 1990.
- A total of 100 yd^3 of asbestos construction material was removed in FY 1990.
- Upgrades to the two waste storage facilities were completed in FY 1990.

Environmental Restoration

- Navy Landfill Solid Waste Water Quality Assessment Test report was submitted in FY 1990.
- Fuel Oil Spill (FOS) Bench-Scale Treatability Study was completed in FY 1990.
- Trudell Interim Cleanup was completed in FY 1990; site was closed in FY 1991.

ISSUES

Corrective Activities

- If existing monitors are not replaced, it will be necessary to continue repairing and refurbishing the existing monitors as best as possible, thereby leading to an increase in the possibility of an undetected release of tritium into the environment that will place workers, the general public, and the environment at risk.
- The longer the existing monitors are used, the greater the possibility of an undetected release of tritium into the environment.

Environmental Restoration

- A full risk assessment for benzene at the FOS site was incorporated into the FOS feasibility study. Benzene, a known carcinogen, presents a health risk to persons ingesting the groundwater from this site. However, the aquifer is not used as a source of drinking water for either people or animals, and it is not used for irrigation.

Funding: Validated Target Level ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	280	0	1,200	0	1,629	0	254	0	3,363
FY92	755	0	1,775	0	3,977	0	3,676	0	10,183
FY93	0	0	1,866	0	842	0	3,356	0	6,064
FY94	0	0	2,042	0	343	0	1,670	0	4,055
FY95	0	0	2,518	0	313	0	843	0	3,674
FY96	0	0	2,729	0	226	0	783	0	3,738
FY97	0	0	3,003	0	239	0	615	0	3,857
FY93-97	0	0	12,158	0	1,963	0	7,267	0	21,388

Funding: Preliminary Unvalidated Case ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	280	0	1,200	0	1,629	0	254	0	3,363
FY92	755	0	1,775	0	3,977	0	3,676	0	10,183
FY93	0	0	1,866	0	915	0	3,456	0	6,237
FY94	0	0	2,042	0	443	0	2,433	0	4,918
FY95	0	0	2,518	0	410	0	1,821	0	4,749
FY96	0	0	2,729	0	338	0	1,547	0	4,614
FY97	0	0	3,003	0	328	0	1,457	0	4,788
FY93-97	0	0	12,158	0	2,434	0	10,714	0	25,306

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.

ALBUQUERQUE FIELD OFFICE INSTALLATION SUMMARY SOUTH VALLEY SITE

FACILITY DESCRIPTION

From 1951 to 1967, the Atomic Energy Commission (AEC) operated a metal working plant associated with weapons production in the South Valley of Albuquerque, ~2 miles west of Kirtland Air Force Base. The Air Force then bought the plant in 1967 and produced jet engines there until 1984. In 1984, General Electric (GE) bought the plant. Discovery of solvent contamination of a nearby municipal well in 1980 led to the designation of the South Valley Superfund Site in 1983. As a former owner (as AEC), DOE is liable for its share (43.2 percent) of the cleanup.

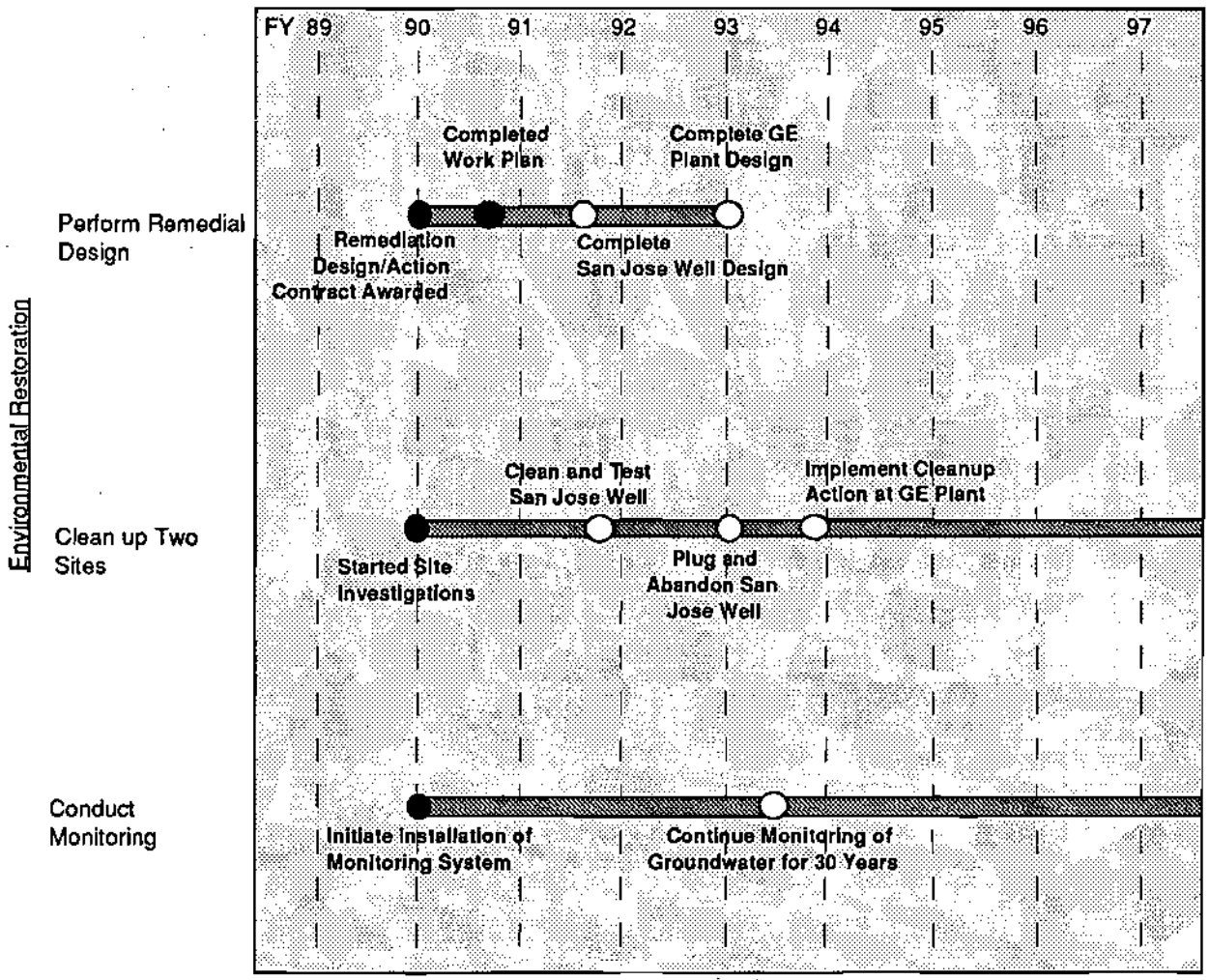
MAJOR MILESTONES

Environmental Restoration	Date
• Complete Remedial Design/Remedial Action (RD/RA) at the GE Plant in San Jose, California.	FY 2003
• Complete RD/RA at the San Jose Operating Unit.	FY 2019

Progress Chart for
Albuquerque Field Office: South Valley Site *

Long-Term Objectives:
Clean up GE Plant by FY 2003
Clean up San Jose Well by FY 2019

Five-Year Objectives:
Complete remedial design on GE Plant and San Jose Well
Initiate remedial action on GE Plant and San Jose Well
Initiate 30-year monitoring



Legend

- ○ Planned Milestones
- ● Completed Milestones
- ▬ Activities

Acronyms and Initialisms

GE- General Electric

NOTE: There are no Corrective Activities or Waste Operations at the South Valley Site

*** For Validated Target Level**

STATUS/ACCOMPLISHMENTS

Environmental Restoration

- RD/RA began in FY 1990.
- EPA issued a unilateral cleanup order to GE in July 1989 under CERCLA 106.
- Project continues to meet requirements of the order.
- Soil-vapor surveys, soil borings, and monitoring wells were completed.
- Current cleanup activities continue with additional monitoring wells being drilled as required by EPA.
- Additional data are being gathered to design a soil extraction system at the Plant 83 operable unit (OU).
- Access agreements are being obtained, and data are being gathered to seal and abandon wells.

ISSUES

Applicable Regulations

CERCLA: EPA Special Notice Letters identified DOE, the Air Force, and GE as potentially responsible parties liable for cleanup activities at GE and the San Jose Well No. 6 OUs. Applicable State Regulations and DOE Orders are also considered.

Environment, Safety and Health Risks

Contamination of the underlying aquifer with solvents is a potential health risk.

Access Problems

The city of Albuquerque has caused delays in installing monitoring wells and abandoning San Jose Well No. 6. Although San Jose Well No. 6 has been replaced by the EPA, the city wants to have the aquifer remediated so they can continue to use the well.

Funding: Validated Target Level ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	0	0	0	0	0	3,000	0	3,000
FY92	0	0	0	0	0	0	2,064	0	2,064
FY93	0	0	0	0	0	0	872	0	872
FY94	0	0	0	0	0	0	872	0	872
FY95	0	0	0	0	0	0	839	0	839
FY96	0	0	0	0	0	0	809	0	809
FY97	0	0	0	0	0	0	780	0	780
FY93-97	0	0	0	0	0	0	4,172	0	4,172

Funding: Preliminary Unvalidated Case ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	0	0	0	0	0	3,000	0	3,000
FY92	0	0	0	0	0	0	2,064	0	2,064
FY93	0	0	0	0	0	0	872	0	872
FY94	0	0	0	0	0	0	872	0	872
FY95	0	0	0	0	0	0	839	0	839
FY96	0	0	0	0	0	0	809	0	809
FY97	0	0	0	0	0	0	780	0	780
FY93-97	0	0	0	0	0	0	4,172	0	4,172

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.

ALBUQUERQUE FIELD OFFICE
INSTALLATION SUMMARY
URANIUM MILL TAILINGS REMEDIAL ACTION PROJECTS

FACILITY DESCRIPTION

The Uranium Mill Tailings Remedial Action (UMTRA) and the Uranium Mill Tailings Groundwater Restoration (UMTGR) are two Major System Acquisition Projects treated as an installation under the nondefense Environmental Restoration (ER) Program. Work on both projects was authorized in 1978 when Congress passed the Uranium Mill Tailings Radiation Control Act (UMTRCA) (Public Law 95-604), which directed DOE to provide for stabilization and control of the uranium mill tailings from inactive sites in a safe and environmentally sound manner. The UMTRCA provides for the States to pay 10 percent of remedial action (RA) costs at sites within the States, while DOE ER pays the remaining cost. The sandlike tailings, located at 24 sites and 5,000 vicinity properties in 10 States and on Tribal lands, are the result of uranium production from the early 1950s until the early 1970s. Tailings remediation and groundwater restoration of each site include a Remedial Action Plan approved by the State or Tribe and the Nuclear Regulatory Commission (NRC); Environmental Assessment (EA) or Environmental Impact Statement (EIS); design/engineering, construction, surveillance, and maintenance; and licensing by the NRC.

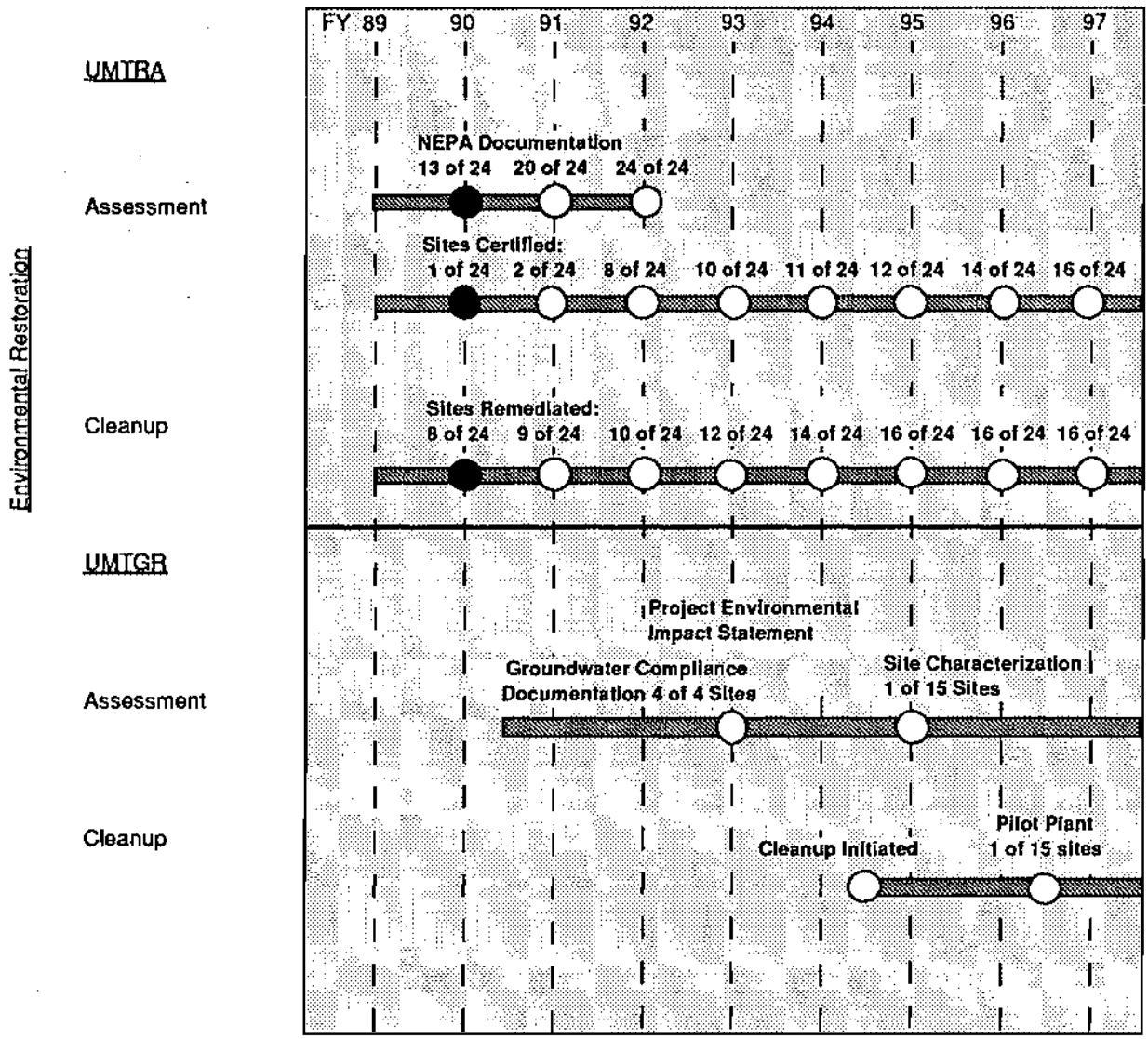
MAJOR MILESTONES

Environmental Restoration	Date
• Complete UMTRA surface remediation at one site and 343 additional vicinity properties, begin remediation at one site, resume remediation at two sites, and have a total of seven sites under construction.	FY 1992
• Complete preparation for NRC licensing for four surface sites.	FY 1992
• Complete all remaining UMTRA National Environmental Policy Act (NEPA) documentation and site engineering for surface sites.	FY 1992
• Complete UMTRA surface remediation at two additional sites and 26 additional vicinity properties and have six sites under construction. Complete preparation for NRC licensing for two surface sites.	FY 1993
• Complete UMTGR projectwide EIS.	FY 1993
• Complete UMTRA surface remediation at two additional sites and at all remaining Grand Junction vicinity properties for a total of 5,071 and have six sites under construction during FY 1994. Complete preparation for NRC licensing for two surface sites.	FY 1994
• Complete UMTRA surface remediation at two additional sites. Four sites will be under remediation. Complete preparation for NRC licensing for two surface sites.	FY 1995
• Complete UMTGR conceptual planning at one site. Continue UMTRA surface remediation at two sites.	FY 1995
• Continue UMTRA at two sites. Complete preparation for NRC licensing for two sites. Complete UMTGR conceptual planning at three additional sites and complete UMTGR pilot plant at one site.	FY 1996
• Continue UMTRA surface remediation at two sites. Complete preparation for NRC licensing for two surface sites. Eight UMTRA surface sites remain to be remediated. Complete licensing and transfer a total of 15 UMTRA surface sites to the DOE Long-Term Surveillance and Maintenance Program.	FY 1997

Progress Chart for
Albuquerque Field Office: Uranium Mill Tailings Remedial Action Projects Office*

Long-Term Objectives:
Clean up all surface tailings by FY 2000
Certify all surface sites by FY 2002
Clean up all groundwater contamination by FY 2033
Obtain NRC license of all surface sites by FY 2003

Five-Year Objectives:
Complete remedial action on 67 percent of surface sites
Certify 67 percent of surface sites
Assess groundwater at 7 percent of sites where restoration is required
Complete groundwater compliance documentation at four sites where no active groundwater restoration is required



Legend

- ○ Planned Milestones
- ● Completed Milestones
- ▬ Activities

Acronyms and Initialisms

* For Validated Target Level

STATUS/ACCOMPLISHMENTS

Environmental Restoration

- UMTRA surface remediation was completed at 8 of 24 sites prior to FY 1991. Four of these were completed in FY 1990. Through FY 1990, remediation has been completed at more than 4,088 of 5,115 vicinity properties; more than 4,000 are the responsibility of the Idaho Field Office under the UMTRA Project. Remediation was completed at 654 vicinity properties in 1990, out of a planned commitment of 721 properties.
- One additional UMTRA site is planned to be completed by the end of FY 1991. To date in FY 1991, 64 of the scheduled 213 vicinity properties have been initiated for remediation.
- UMTRA NEPA documentation is to be completed at seven additional sites with the remaining four surface sites scheduled for completion during FY 1992.
- UMTRA site engineering design is to be completed at six additional surface sites with five surface sites remaining in FY 1992.
- Four UMTRA surface sites are due to be under construction by the end of FY 1991.
- UMTGR assessment and Project Environmental Impact Statement initiated in FY 1991.

ISSUES

Health Risks

The hazards that UMTRA is remediating include over 30 million yd^3 of tailings and ~ 5,000 vicinity properties where tailings were used in the foundations of inhabited or commercial buildings or where tailings blew onto open land from mill sites. Hazards result from radon gas, gamma radiation decay products (214 Pb and 214 Bi), asbestos, other hazardous and mixed organic wastes at mill sites, and RCRA-listed hazardous constituents in groundwater plus molybdenum, radium, uranium, selenium, and nitrates.

- Unstabilized piles will continue to emanate radon gas and allow dispersal of windblown contamination.
- Unremediated vicinity properties can expose occupants of residential and commercial structures to unacceptable levels of radon gas.
- Unstabilized tailings piles will continue to contaminate groundwater through infiltration of water.

Regulatory Drivers

- PL 95-604, UMTRCA.
- 40 CFR 192: Due to a Federal Court remand, the EPA has revised the portions of its UMTRA standards dealing with groundwater protection and restoration. Though these standards have not been promulgated in final form, DOE must comply with the proposed standards until they become final.
- PL 100-616 UMTRA's authorizing legislation, as amended in 1988, requires that RA for tailings be completed by September 1994 and provides unlimited time for groundwater restoration.
- State regulations where they are applicable.
- RCRA.
- DOE Orders.

Funding: Validated Target Level* ($ in Thousands)

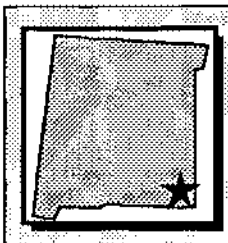
	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	0	0	0	0	20,026	0	67,841	87,867
FY92	0	0	0	0	0	17,094	0	88,922	106,016
FY93	0	0	0	0	0	17,937	0	93,738	111,675
FY94	0	0	0	0	0	15,291	0	58,295	73,586
FY95	0	0	0	0	0	12,809	0	30,057	42,866
FY96	0	0	0	0	0	12,051	0	20,208	32,259
FY97	0	0	0	0	0	10,570	0	20,429	30,999
FY93-97	0	0	0	0	0	68,658	0	222,727	291,385

Funding: Preliminary Unvalidated Case* ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	0	0	0	0	19,497	0	68,370	87,867
FY92	0	0	0	0	0	18,786	0	87,230	106,016
FY93	0	0	0	0	0	26,974	0	112,208	139,182
FY94	0	0	0	0	0	39,445	0	95,994	135,439
FY95	0	0	0	0	0	42,221	0	66,640	108,861
FY96	0	0	0	0	0	37,861	0	2,565	40,426
FY97	0	0	0	0	0	33,423	0	0	33,423
FY93-97	0	0	0	0	0	179,924	0	277,407	457,331

*includes funding for UMTRA activities at Idaho Field Office-Grand Junction, Chicago Field Office-Brookhaven, Oak Ridge Field Office-K-25 Site and Oak Ridge National Laboratory, and San Francisco-Stanford Linear Accelerator Center.

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.



ALBUQUERQUE FIELD OFFICE INSTALLATION SUMMARY WASTE ISOLATION PILOT PLANT

FACILITY DESCRIPTION

The Waste Isolation Pilot Plant (WIPP), located 26 miles east of Carlsbad, New Mexico, is a research and development facility vested with the vital mission of demonstrating the safe disposal of radioactive transuranic (TRU) waste resulting from U.S. defense activities and programs. It is the only facility in the United States specifically designed and constructed for the long-term storage of TRU wastes. WIPP is essential to our national defense programs and is a solution to the growing problems of how to safely and efficiently dispose of radioactive waste in an environmentally sound manner.

MAJOR MILESTONES

Waste Management

• Complete WIPP Base Facility.	2Q FY 1991
• Complete prerequisites for start of Test Phase.	4Q FY 1991
• Receive first waste and begin Test Phase.	4Q FY 1991
• Start bin tests.	4Q FY 1991
• Start leachability and solubility tests.	3Q FY 1992
• Start alcove tests.	4Q FY 1993
• Complete leachability and solubility tests.	1Q FY 1995
• Complete data collection from bin tests.	2Q FY 1996
• Complete Final Performance Assessments.	1Q FY 1997
• Make decision on permanent disposal in WIPP.	1Q FY 1998

STATUS/ACCOMPLISHMENTS

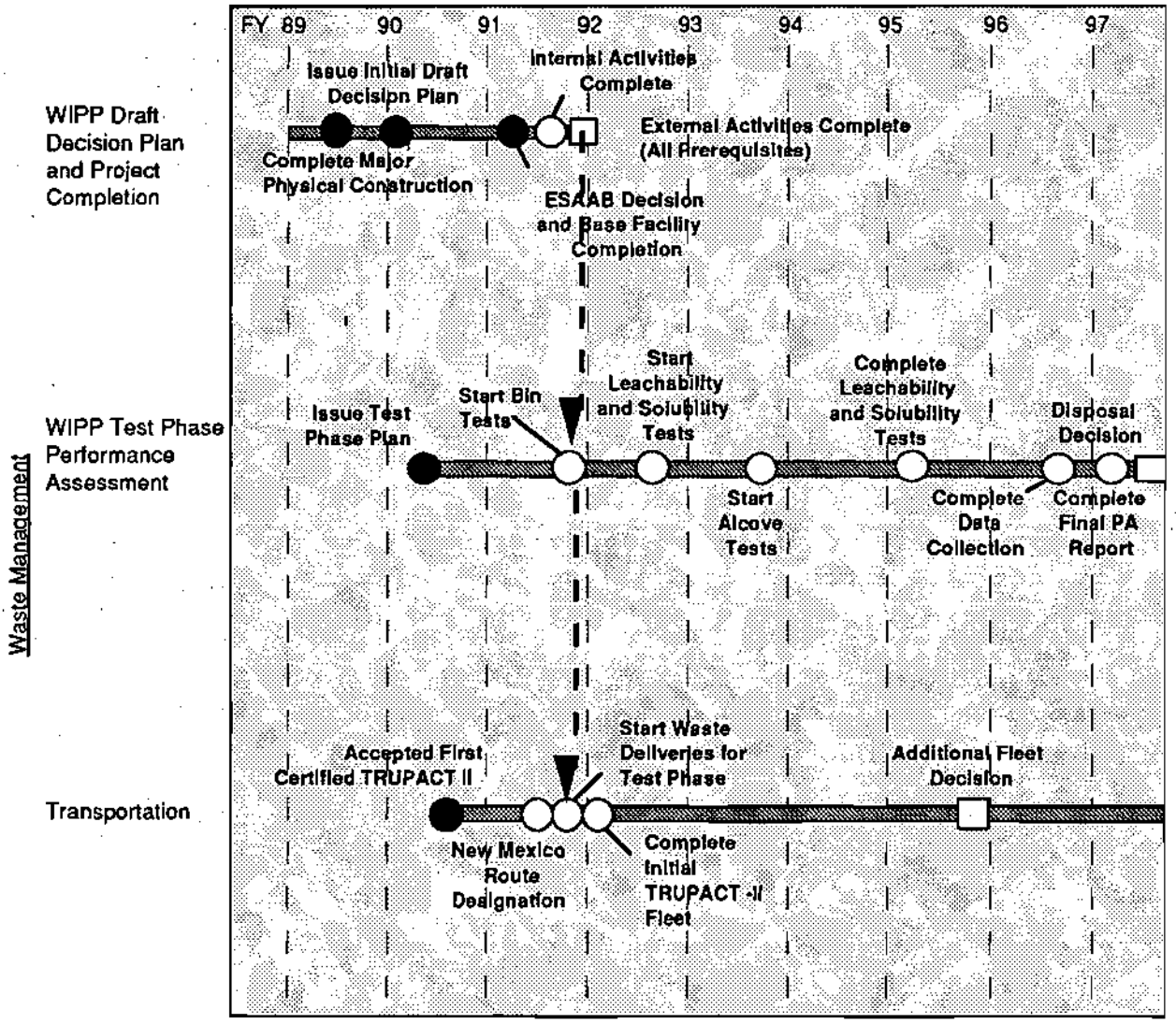
Waste Management

- The Supplemental EIS was completed in January 1990, and its companion Record of Decision was issued in June 1990.
- The Final Safety Analysis Report (FSAR) was issued in June 1990.
- The EPA issued a No-Migration Determination in November 1990.
- A transportation exercise was conducted with simulated accident (TRANSAX-90) in November 1990.
- Revision 0 of the Waste Characterization Plan was issued in January 1991.
- RCRA Part A and Part B Permit Applications were sent to New Mexico in January 1991 and February 1991, respectively.
- The DOE Energy System Acquisition Advisory Board rendered a decision to close out the WIPP construction phase in March 1991.
- Base facility was completed in March 1991.
- The initial waste bin was loaded at Idaho National Engineering Laboratory in April 1991.
- A draft FSAR Addendum for the dry-bin tests is currently undergoing external review.
- Quality assurance documents for bin preparation activities are being prepared.
- Integrated systems checkout activities are continuing on all Test Phase systems.

Progress Chart for
Albuquerque Field Office: Waste Isolation Pilot Plant (WIPP)*

Long-Term Objectives:
Start full TRU Waste Disposal in early FY 1998
Complete TRU Waste Disposal by FY 2023

Five-Year Objectives:
Start alcove test in late FY 1993
Complete leachability and solubility tests in early FY 1995
Complete data collection for bin and alcove test in FY 1996
Complete Final Performance Assessments in early FY 1997



Legend

- Planned Milestones
- Completed Milestones
- Decision Point
- Information Flows
- Activities

Acronyms and Initialisms

PA-	Performance Assessment
ESAAB-	Energy Systems Acquisition Advisory Board
TRUPACT II-	Transuranic Package Transporters

* For Validated Target Level

ISSUES

- DOE is working with the Administration and Congress to obtain permanent land withdrawal for the WIPP site through legislation. In January 1991, the Department of the Interior issued a public land order (PLO) for the WIPP site that extended the existing PLO until June 1997, provided certain conditions were met. In response to the House Committee on Insular Affairs resolution passed on March 6, 1991, the Secretary of Interior has proposed to modify the January 1991 PLO to prohibit the emplacement of test wastes within the WIPP site until June 30, 1991. The DOE continues to seek legislative land withdrawal as the preferred approach.

- Under Federal regulations, shipments of TRU waste must use the most direct Interstate Highway route or an alternate route designated and authorized by the State routing agency. In October 1990, the New Mexico Environmental Improvement Board (EIB) identified an alternate route after conducting public hearings and analysis. The route was challenged by the New Mexico State Highway and Transportation Department on the basis that a portion of the route was unsafe. In April, New Mexico transferred authority for route designation from EIB to the Highway Commission. As a result of this action, the availability of a State alternative route for initial waste shipments is uncertain. DOE is evaluating available options.

- Several changes in the WIPP regulatory environment have occurred since issuance of the Record of Decision for WIPP in 1981. The changes that have the most significant impacts on WIPP are those associated with the application of RCRA to hazardous waste constituents. WIPP has submitted RCRA Parts A and B Permit Applications to New Mexico but has not received formal feedback. Impacts from State regulatory requirements and any other future changes in the regulatory environment are sources of project uncertainty.

Funding: Validated Target Level ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	0	163,708	0	0	0	0	0	163,708
FY92	0	0	142,118	0	0	0	0	0	142,118
FY93	0	0	185,000	0	0	0	0	0	185,000
FY94	0	0	177,816	0	0	0	0	0	177,816
FY95	0	0	215,597	0	0	0	0	0	215,597
FY96	0	0	237,000	0	0	0	0	0	237,000
FY97	0	0	232,101	0	0	0	0	0	232,101
FY93-97	0	0	1,047,514	0	0	0	0	0	1,047,514

Funding: Preliminary Unvalidated Case ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	0	163,708	0	0	0	0	0	163,708
FY92	0	0	142,118	0	0	0	0	0	142,118
FY93	0	0	202,000	0	0	0	0	0	202,000
FY94	0	0	237,674	0	0	0	0	0	237,674
FY95	0	0	236,923	0	0	0	0	0	236,923
FY96	0	0	229,961	0	0	0	0	0	229,961
FY97	0	0	237,066	0	0	0	0	0	237,066
FY93-97	0	0	1,143,624	0	0	0	0	0	1,143,624

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.

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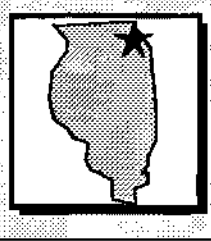


CHICAGO FIELD OFFICE
INSTALLATION SUMMARY
ARGONNE NATIONAL LABORATORY-EAST

FACILITY DESCRIPTION

Argonne National Laboratory - East (ANL-E) occupies a 1700-acre tract located ~ 22 miles southwest of downtown Chicago, in DuPage County, Illinois. ANL-E is a multidisciplinary research and development laboratory that conducts basic and applied research to support the development of energy-related technologies. Activities at ANL-E include nuclear reactor design, synchrotron radiation accelerator design, and environmental research programs. Environmental Restoration activities at ANL-E could potentially include 13 remedial actions, 3 decontamination and decommissioning (D&D) projects, and 2 removal actions.

MAJOR MILESTONES

Corrective Activities	Date
• Complete cooling tower blowdown diversion.	FY 1991
• Rehabilitate sewer systems.	FY 1993
• Complete equalization pond.	FY 1993
• Upgrade sanitary wastewater treatment plant.	FY 1993
• Upgrade laboratory wastewater treatment plant.	FY 1993
• Complete removal of sediment from Freund Pond.	FY 1994
• Complete landfill leachate collection system.	FY 1994
• Upgrade canal water treatment plant.	FY 1994

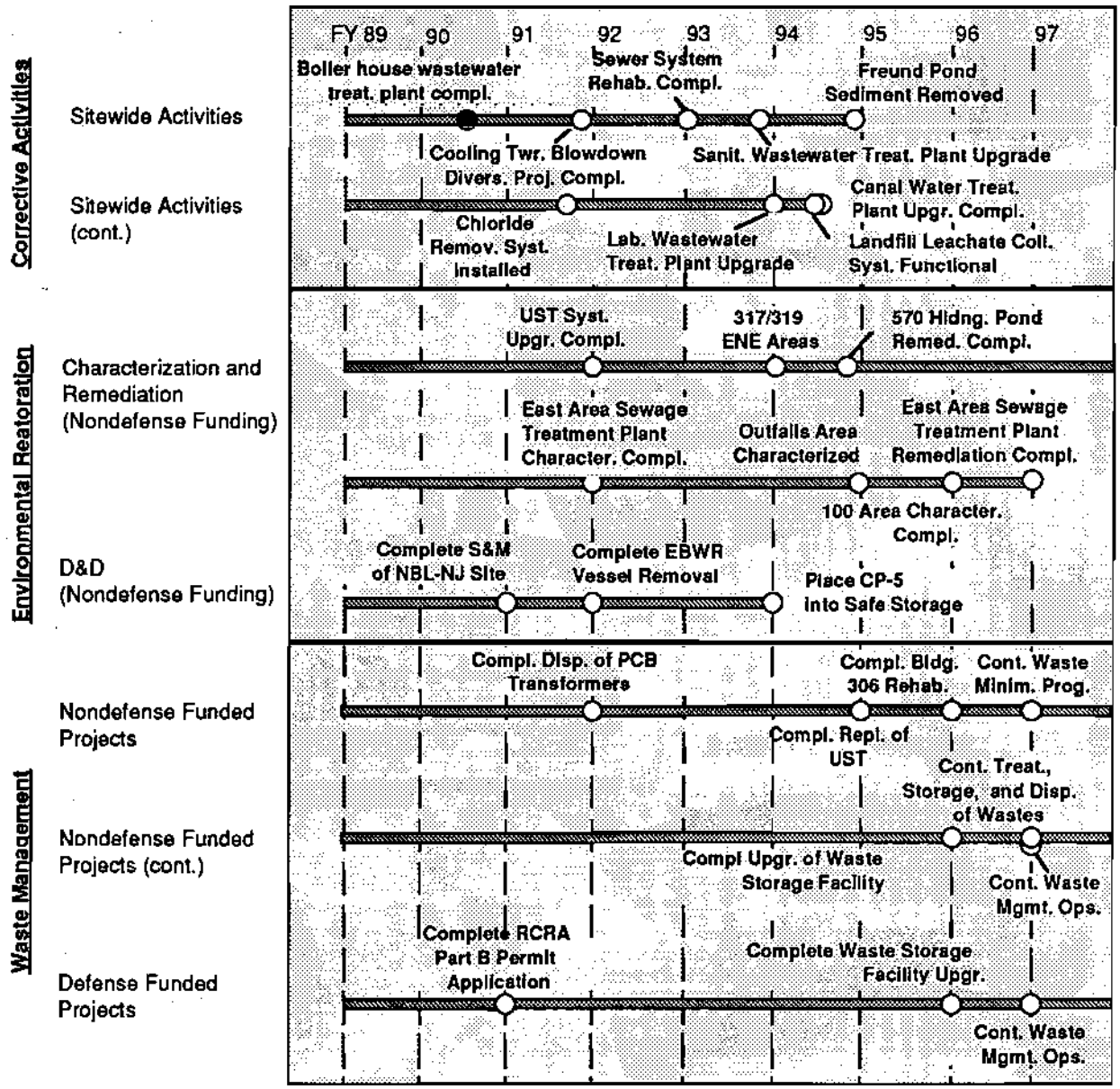
Waste Management	
• Complete Waste Minimization assessments.	FY 1992
• Complete Alpha Gamma Hot Cell Facility upgrade.	FY 1993
• Complete storm water discharge characterization.	FY 1994
• Complete Waste Management Facility upgrades.	FY 1995
• Complete Safety Analysis Report for Waste Operations.	FY 1997

Environmental Restoration	
• Complete annual environmental radiological surveillance and maintenance (S&M) activities and issue report.	FY 1991
• Complete Experimental Boiling Water Reactor (EBWR) reactor vessel removal.	FY 1992
• Complete 800 Area landfill characterization.	FY 1994
• Remediate 570 Holding Pond.	FY 1994
• Place CP-5 into Safe Storage.	FY 1994
• Complete 317/319 Areas characterization.	FY 1994

Progress Chart for Chicago Field Office: Argonne National Laboratory-East*

Long-Term Objective:
Remediate all sites by FY 2019

Five-Year Objective:
Perform 50 percent of investigations



Legend

- ○ Planned Milestones
- ● Completed Milestones
- Material Flows
- Activities

Acronyms and Initialisms

NBL-NJ - New Brunswick Laboratory - New Jersey
PCB- Polychlorinated Biphenyl
UST- Underground Storage Tank

*For Validated Target Level

STATUS/ACCOMPLISHMENTS

Corrective Activities

- The conceptual, preliminary, and final designs were completed for the coal-pile runoff treatment plant, and construction began (April 1990). Construction will be complete in April 1992 as scheduled.
- The construction of the sewer for chloride removal system is complete (May 1991).
- The repair/upgrade of the laboratory and sanitary sewer collection system is ongoing. Construction begins August 1991 and is to be completed September 1993.

Waste Management

- Waste Minimization plans were prepared (FY 1990).
- Preliminary design for the Waste Management facility upgrade began January 1990.
- Design began on mixed waste and hazardous storage facilities (March 1991).
- Shipments to offsite waste disposal facilities have been completed safely and without incident.
- In response to Tiger Team findings, new staff has been added, and the existing staff has received additional training, greatly enhancing the quality and safety of Waste Operations.
- The final design of Phase I for UST upgrades was completed (June 1990).

Environmental Restoration

- The sitewide RCRA Part B Permit Application was submitted to the Illinois EPA (FY 1990).
- ANL-E is enhancing its environmental restoration program management through restructuring; an Assistant Laboratory Manager position for environment, safety, and health/quality assurance (ESH/QA) was created (FY 1991).
- D&D of the EBWR is progressing. More than 1,000 ft^3 of low-level radioactive wastes has been packaged for disposal, and miscellaneous decontamination and cleanup have been done (FY 1990).
- Cleanup of the CP-5 yard was initiated, and TITLE III construction was started (FY 1990).
- NBL-NJ was transferred to the Formerly Utilized Sites Remedial Action Program at the Oak Ridge Field Office (FY 1990).

ISSUES

- Facility upgrades to enhance waste operations are required.
- There is a potential for release of radioactive contamination containing highly contaminated components and structures from the deteriorating CP-5 containment building.
- There is a potential for release of radiological and chemical contaminants to offsite surface drainage systems.
- There is a potential environmental risk to groundwater from uncharacterized inactive sites.

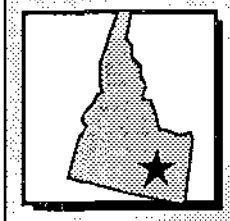
Funding: Validated Target Level ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	6,264	4,255	2,836	0	4,831	0	7,089	25,275
FY92	0	9,292	1,160	3,168	0	4,775	0	2,687	21,082
FY93	0	1,990	100	14,894	0	6,392	0	1,919	25,295
FY94	0	0	440	19,920	0	8,488	0	1,760	30,608
FY95	0	0	308	19,943	0	6,815	0	3,410	30,476
FY96	0	0	322	21,482	0	6,156	0	2,366	30,326
FY97	0	0	335	23,380	0	5,897	0	2,816	32,428
FY93-97	0	1,990	1,505	99,619	0	33,748	0	12,271	149,133

Funding: Preliminary Unvalidated Case ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	6,264	4,255	2,836	0	4,831	0	7,089	25,275
FY92	0	9,292	1,160	3,168	0	4,775	0	2,687	21,082
FY93	0	1,990	720	20,990	0	12,616	0	10,441	46,757
FY94	0	0	290	19,137	0	13,791	0	11,945	45,163
FY95	0	0	308	20,814	0	11,925	0	13,718	46,765
FY96	0	0	322	22,371	0	8,941	0	4,222	35,856
FY97	0	0	335	26,076	0	7,262	0	4,068	37,741
FY93-97	0	1,990	1,975	109,388	0	54,535	0	44,394	212,282

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.



CHICAGO FIELD OFFICE
INSTALLATION SUMMARY
ARGONNE NATIONAL LABORATORY-WEST

FACILITY DESCRIPTION

Argonne National Laboratory-West (ANL-W) is located on the southeastern portion of the Idaho National Engineering Laboratory (INEL) near Idaho Falls, Idaho. The primary mission is research and development in support of the Nation's advanced reactor program. Reactor complexes at ANL-W include the Experimental Breeder Reactor II (EBR II), the Transient Reactor Test Facility (TREAT), and the Zero Power Physics Reactor (ZPPR).

MAJOR MILESTONES

Corrective Activities	Date
• Install 150 liners at the Radioactive Scrap and Waste Facility (RSWF).	FY 1991
• Install 100 liners at the RSWF.	FY 1992
• Install leak detection on underground storage tanks (USTs).	FY 1994
• Complete waste container relocation to new liners.	FY 1994

Waste Management	
• Obtain approval for the Remote-Handled Transuranic Waste Certification Plan.	FY 1993
• Complete Title I design for Radioactive Sodium Waste Process Facility.	FY 1994
• Ship 32 containers of waste to the INEL Radioactive Waste Management Center (27 in FY 1991, 31 in FY 1992, 89 in FY 1993, 93 in FY 1994, 96 in FY 1995, 100 in FY 1996, and 104 in FY 1997).	

Environmental Restoration	
• Complete cleanup of polychlorinated biphenyl (PCB) spill.	FY 1993
• Complete the environmental assessment for the decommissioning of the Central Liquid Processing (CLP) Area.	FY 1993
• Complete 93% of decontamination and decommissioning (D&D) of CLP Area.	FY 1996

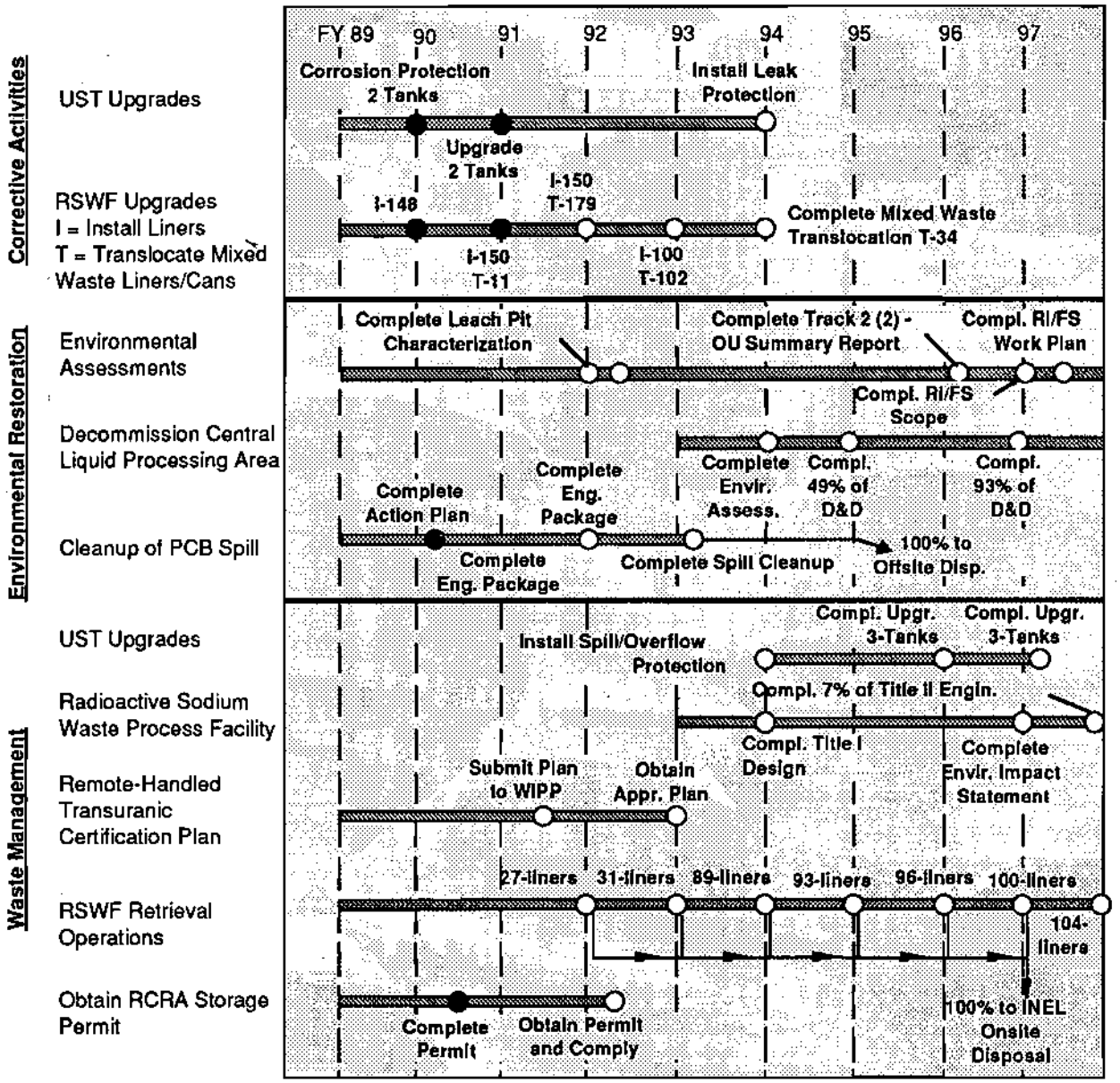
Progress Chart for Chicago Field Office: Argonne National Laboratory-West*

Long-Term Objectives:

Clean up all OUs by FY 2015
Identify waste treatment processes and disposal locations by FY 2005

Five-Year Objectives:

Complete track process on three OUs
Complete RI/FS scope and work plan
Complete cleanup of PCB spill
Translocate all mixed-waste in RSWF



Legend

- ○ Planned Milestones
- ● Completed Milestones
- → Material Flows
- ▒ Activities

Acronyms and Initialisms

OU- Operable Unit
RI/FS- Remedial Investigation/Feasibility Study

*For Validated Target Level

STATUS/ACCOMPLISHMENTS

Corrective Activities

- A total of 150 replacement liners were installed at RSWF in FY 1990, and an additional 150 will be installed in FY 1991.
- Two USTs in FY 1990 were removed and replaced.

Waste Management

- The high-level waste leaching studies test plan was completed in FY 1990.
- Waste minimization assessments began in 4Q FY 1990.

Environmental Restoration

- Plans for the cleanup of the Leach Pit are complete and conditionally approved by EPA Region X in FY 1990.
- EBR-II Leach Pit characterization began in FY 1991.

ISSUES

ANL-W is party to the INEL Consent Order and Compliance Agreement (COCA) issued in 1987. Activities and milestones under the COCA have been restated in the draft Interagency Agreement between Idaho Field Office, EPA Region X, and the State of Idaho.

In 1989, INEL was placed on the National Priorities List.

Leak detection and spill overflow protection will be provided for all USTs in accordance with 40 CRF 280.

Radioactive waste contaminated with sodium is currently stored as a mixed waste (40 CFR 268.5) and needs to be treated before disposal or alternative use.

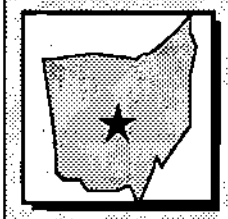
Funding: Validated Target Level ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	603	0	1,331	0	867	267	0	3,068
FY92	0	529	0	1,810	0	452	533	0	3,324
FY93	0	247	315	1,935	0	935	50	0	3,482
FY94	0	0	924	2,244	0	515	769	0	4,452
FY95	0	0	599	2,491	0	1,379	0	0	4,469
FY96	0	0	770	2,560	0	467	648	0	4,445
FY97	0	0	1,172	2,496	0	1,119	0	0	4,787
FY93-97	0	247	3,780	11,726	0	4,415	1,467	0	21,635

Funding: Preliminary Unvalidated Case ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	603	0	1,331	0	867	267	0	3,068
FY92	0	529	0	1,810	0	452	533	0	3,324
FY93	0	247	315	2,235	0	932	50	0	3,779
FY94	0	0	924	2,232	0	515	1,564	0	5,235
FY95	0	0	976	2,491	0	1,420	0	0	4,887
FY96	0	0	8,414	2,560	0	467	0	0	11,441
FY97	0	0	11,687	2,496	0	1,453	0	0	15,636
FY93-97	0	247	22,316	12,014	0	4,787	1,614	0	40,978

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.



CHICAGO FIELD OFFICE
INSTALLATION SUMMARY
BATTELLE COLUMBUS LABORATORIES

FACILITY DESCRIPTION

Battelle Columbus Laboratories (BCL) comprises two major research complexes in the City of Columbus and Franklin County, Ohio. The King Avenue site houses corporate offices and general research laboratories. The rural West Jefferson Site contains a number of facilities formerly dedicated to nuclear research. Since mid-1943, the Battelle Memorial Institute has continuously performed contract research and development work at its Columbus Laboratories for DOE and its predecessor agencies. Fifteen buildings, or portions thereof, that became radioactively contaminated as a result of performance of work under the government contract are to be decontaminated and released to BCL. BCL maintains an active Nuclear Regulatory Commission license.

MAJOR MILESTONES

Environmental Restoration	Date
• Complete decontamination and decommissioning (D&D) of Building A.	FY 1992
• Complete D&D of Building 3.	FY 1993
• Complete D&D of Building 6.	FY 1994
• Complete D&D of Building 5.	FY 1996
• Complete D&D of Building 4.	FY 1997
• Complete D&D of Building 1.	FY 1997
• Complete D&D of Building 9.	FY 1998

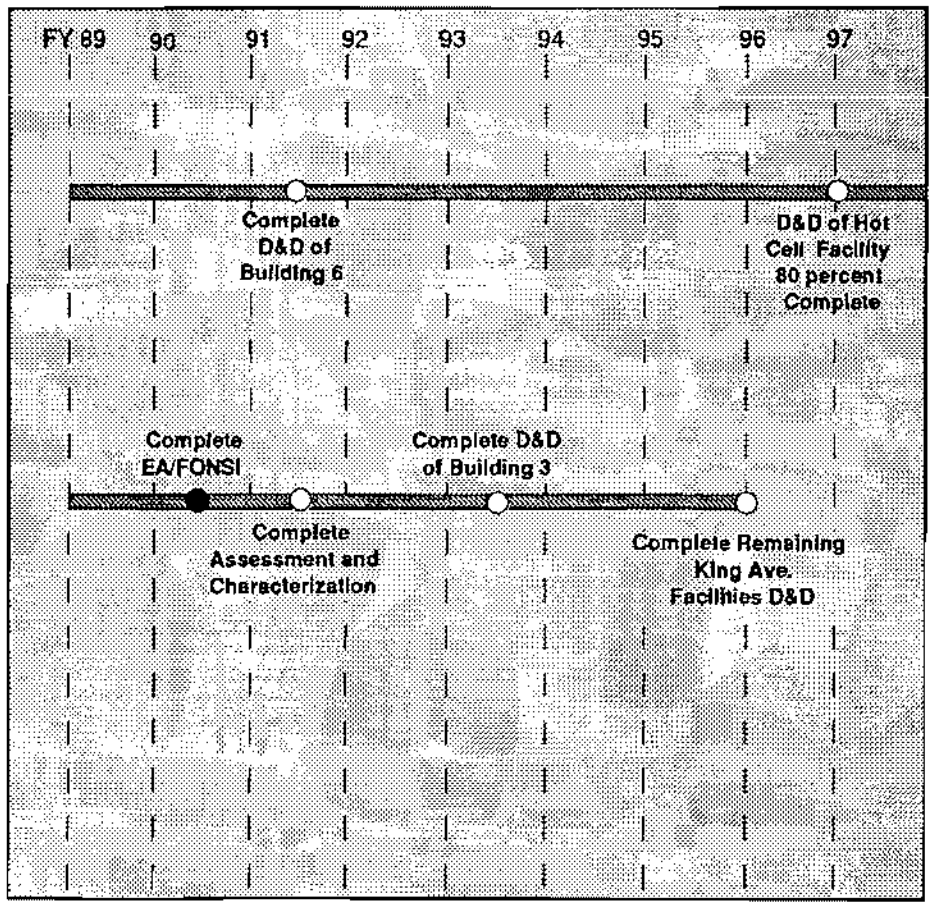
Progress Chart for
Chicago Field Office: Battelle Columbus Laboratories*

Long-Term Objectives:
Complete D&D of BCL and return facilities for unrestricted use.

Five-Year Objectives:
Complete D&D of all King Avenue site buildings

Environmental Restoration

Decontamination/
Decommissioning



Legend

- ○ Planned Milestones
- ● Completed Milestones
- ▨ Activities

Acronyms and Initialisms

EA- Environmental Assessment
FONSI- Finding of No Significant Impact

*For Validated Target Level

STATUS/ACCOMPLISHMENTS

Environmental Restoration

- Environmental Assessment of D&D activities complete; FONSI issued.
- Decontamination of Buildings JS-1, JS-10, and JS-12 completed.

ISSUES

Potential exists for schedule delays due to delays associated with receiving approval to ship TRU waste to WHC.

Potential exists for release of radioactive contamination from deteriorating containment building containing contaminated components and structures.

Potential exists for incurring fines by Ohio EPA unless waste containing PCBs is removed before January 6, 1992.

The D&D of BCL is conducted under the following major requirements:

- DOE Order 5480.1B, Environmental, Safety and Health Program.
- DOE Order 5820.2A, Radioactive Waste Management.
- 40 CFR 260-280, Hazardous Waste Management Regulations.
- U.S. Nuclear Regulatory Commission Requirement 53 FR 24018, June 27, 1988.
- DOE-Battelle Contract, W-7405-ENG-92.

Funding: Validated Target Level ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	0	0	0	1,690	2,147	4,500	3,738	12,075
FY92	0	0	0	0	190	1,104	5,890	10,844	18,028
FY93	0	0	0	0	110	658	0	13,585	14,353
FY94	0	0	0	0	100	581	5,815	13,704	20,200
FY95	0	0	0	0	96	506	6,909	11,084	18,595
FY96	0	0	0	0	93	479	7,730	6,414	14,716
FY97	0	0	0	0	89	492	8,997	3,440	13,018
FY93-97	0	0	0	0	488	2,716	29,451	48,227	80,882

Funding: Preliminary Unvalidated Case ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	0	0	0	1,690	2,147	4,500	3,738	12,075
FY92	0	0	0	0	190	1,104	5,890	10,844	18,028
FY93	0	0	0	0	110	707	0	18,900	19,717
FY94	0	0	0	0	100	722	0	19,819	20,641
FY95	0	0	0	0	96	687	0	17,868	18,651
FY96	0	0	0	0	93	695	0	13,682	14,470
FY97	0	0	0	0	89	537	0	12,132	12,758
FY93-97	0	0	0	0	488	3,348	0	82,401	86,237

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.

CHICAGO FIELD OFFICE
INSTALLATION SUMMARY
BROOKHAVEN NATIONAL LABORATORY

FACILITY DESCRIPTION

Brookhaven National Laboratory (BNL) is a multipurpose research and development laboratory located in central Suffolk County of Long Island about 60 miles east of New York City. The site consists of ~ 8.3 miles^2, most of which is wooded, except for a developed area of about 2.6 miles^2. The laboratory is located over an EPA-designated, sole-source drinking water aquifer. In November 1989, EPA included BNL on the National Priorities List of CERCLA sites. To fulfill its role as a multiprogram laboratory, BNL directs scientific and technical efforts toward missions that include low- and high-energy physics and life sciences and nuclear medicine research. To support the research programs, BNL operates the Alternating Gradient Synchrotron, the National Synchrotron Light Source, and the High-Flux Beam Reactor.

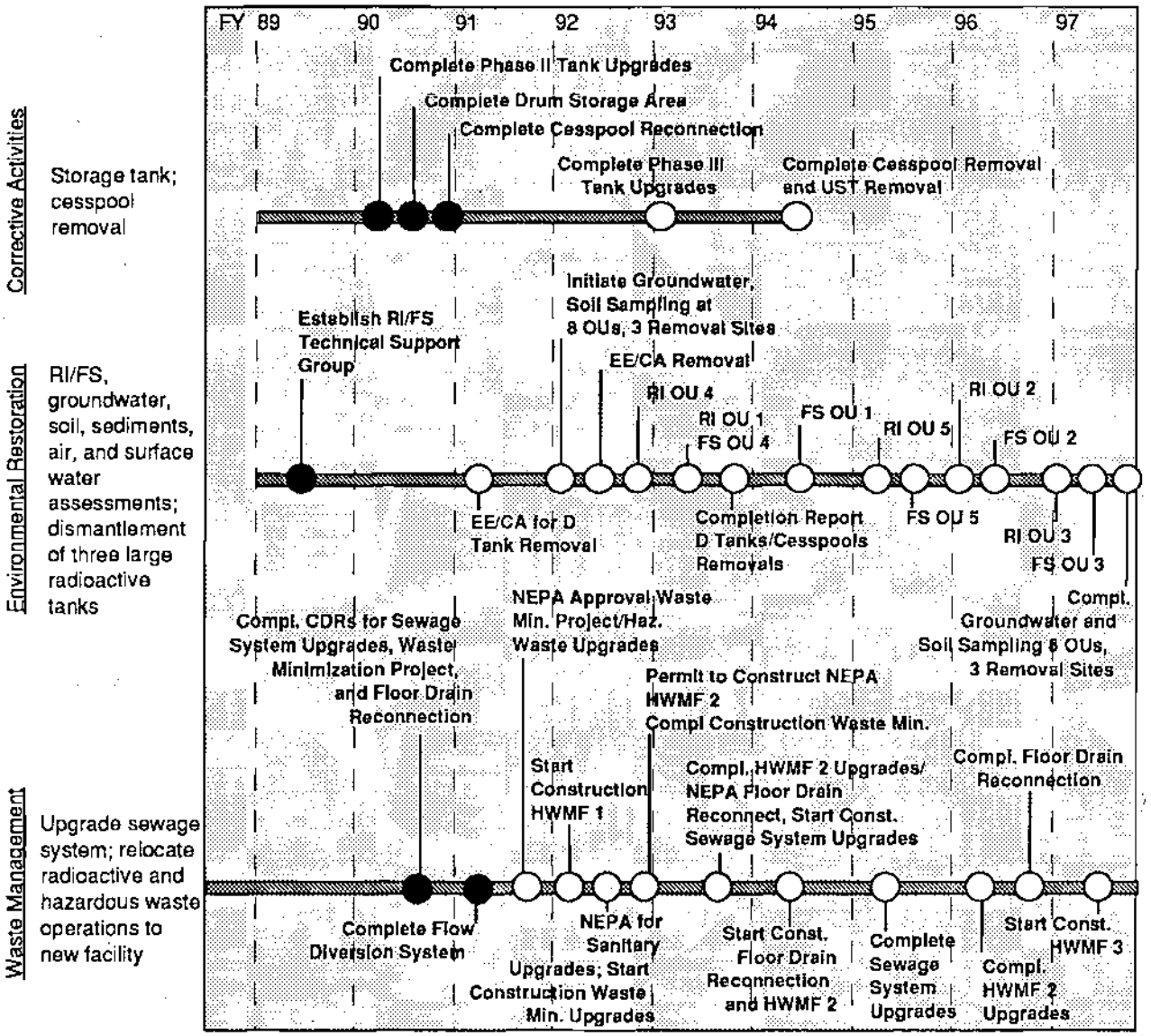
MAJOR MILESTONES

Corrective Activities	Date
• Complete removal/disposal of sludge from underground storage tanks (USTs).	FY 1991
• Complete Phase III storage tank upgrades.	FY 1994
• Complete cesspool closure activities.	FY 1994
Waste Management	
• Initiate construction of "D" waste upgrades.	FY 1992
• Complete Title I design of Sanitary I upgrades.	FY 1993
• Complete Waste Minimization construction.	FY 1993
• Complete sewage systems upgrades.	FY 1995
• Complete construction of Hazardous Waste Management Facility Phase II.	FY 1996
Environmental Restoration	
• Complete sitewide geohydrological characterization report.	FY 1991
• Submit Engineering Evaluation/Cost Assessment (EE/CA) for D Tank removal.	FY 1991
• Send Draft Remedial Investigation/Feasibility Study (RI/FS) Work Plans for Operable Units (OUs) 4 (Central Steam Facility) and 4 (Hazardous Waste Management Facility) to EPA and New York State.	FY 1991
• Initiate RI/FS at OU 1.	FY 1992
• Submit RI report on OU 4 for D Tank dismantlement.	FY 1993
• Submit FS study for OU 4 to EPA and New York State.	FY 1993
• Complete treatability studies at OUs (Sewage Treatment Plant, Leaking Sewer Lines, Eastern Tritium Plume).	FY 1994
• Initiate removals at Aquifer Restoration Area.	FY 1995

Progress Chart for Chicago Field Office: Brookhaven National Laboratory *

Long-Term Objectives:
- Compliance with Federal, State, and local codes for hazardous materials
- Complete RI/FS and removals
- Complete remedial action onsite
- Continue waste management activities with emphasis on waste minimization

Five-Year Objectives:
- Complete removals; investigate removal sites
- Complete RI/FS for eight OUs
- Initiate remedial actions at Central System Facility Area
- Complete construction of new Waste Management Facility
- Complete Sanitary System upgrades and floor drain reconnection



Legend

- ○ Planned Milestones
- ● Completed Milestones
- ▒ Activities

Acronyms and Initialisms

CDR- Conceptual Design Report
HWMF- Hazardous/Radioactive Waste Management Facility
NEPA- National Environmental Policy Act

*For Validated Target Level

STATUS/ACCOMPLISHMENTS

Corrective Activities

- Five USTs were removed and the contents analyzed (FY 1990).
- Industrial cesspools were reconnected to the sewer line (3Q FY 1990).
- New drum storage building was completed (3Q FY 1990).
- Cesspool removal Sampling and Analysis Plan was submitted to EPA/New York State Department of Environmental Conservation (1Q FY 1991).

Waste Management

- Industrial cesspool was reconnected to sewer system (3Q FY 1990).
- Waste minimization plans were completed (4Q FY 1990).
- CDR for Phase II Hazardous Waste Management Facility was completed (1Q FY 1991).
- Vehicle radiation monitoring station construction was completed (2Q FY 1991).
- Construction of the automatic diversion system was completed (2Q FY 1991).
- CDRs for Phase I and II Hazardous Waste Management Facility started (3Q FY 1991).

Environmental Restoration

- Offsite disposal of waste tank sludge was completed.
- More than 51 new wells were installed, sampled, and analyzed since 1988.
- Various reports and plans required by, or in support of, the Interagency Agreement have been prepared and submitted to EPA and New York State.

ISSUES

- Potential contamination of onsite soil and underlying aquifer.
- Need for facility upgrades or construction to enhance waste operations safety and efficiency.
- Applicable regulations and agreements include the following: CERCLA; RCRA; Clean Water Act; 1987 Joint BNL-Suffolk County Agreement; Interagency Agreement (DOE/EPA/New York State); Suffolk County Sanitary Code; DOE Orders 5820.2A, 5400.1, and 5400.3.

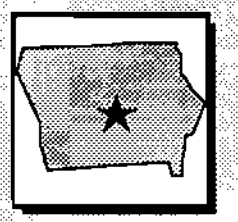
Funding: Validated Target Level ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	2,004	730	3,508	0	7,438	0	0	13,680
FY92	0	238	940	6,255	0	4,758	0	0	12,191
FY93	0	0	0	7,059	0	6,236	0	400	13,695
FY94	0	0	0	8,440	154	5,548	0	400	14,542
FY95	0	0	0	9,230	154	5,912	0	385	15,681
FY96	0	0	0	12,469	42	5,205	0	0	17,716
FY97	0	0	0	9,768	21	5,034	0	179	15,002
FY93-97	0	0	0	46,966	371	27,935	0	1,364	76,636

Funding: Preliminary Unvalidated Case ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	2,004	730	3,508	0	7,438	0	0	13,680
FY92	0	238	940	6,255	0	4,758	0	0	12,191
FY93	0	0	0	8,370	148	11,139	0	3,900	23,557
FY94	0	0	0	11,576	154	8,603	0	2,700	23,033
FY95	0	0	0	11,986	41	7,694	0	15,776	35,497
FY96	0	0	0	9,399	21	3,708	0	11,601	24,729
FY97	0	0	0	6,021	0	4,495	0	12,694	23,210
FY93-97	0	0	0	47,352	364	35,639	0	46,671	130,026

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.



CHICAGO FIELD OFFICE INSTALLATION SUMMARY COMBINED LABORATORIES

FACILITY DESCRIPTION

Fermi National Accelerator Laboratory (Fermi), located west of Chicago, Illinois, is a single-program installation for exploring the fundamental structure of matter using high-energy particle accelerators. Fermi operates the Tevatron, the world's highest energy accelerator in both fixed-target and colliding beams modes.

Princeton Plasma Physics Laboratory (PPPL), located in Princeton, New Jersey, conducts research in magnetic confinement fusion and also investigates the practical applications of plasma physics. These activities include the experimental demonstration of economical fusion power through development of the Tokamak series of fusion reactors.

Ames Laboratory, located at Iowa State University, Ames, Iowa, conducts basic research in materials and chemicals sciences and related research in materials reliability and nondestructive evaluation. Ames maintains capabilities for preparing high-purity metals, alloys, compounds, and single crystals.

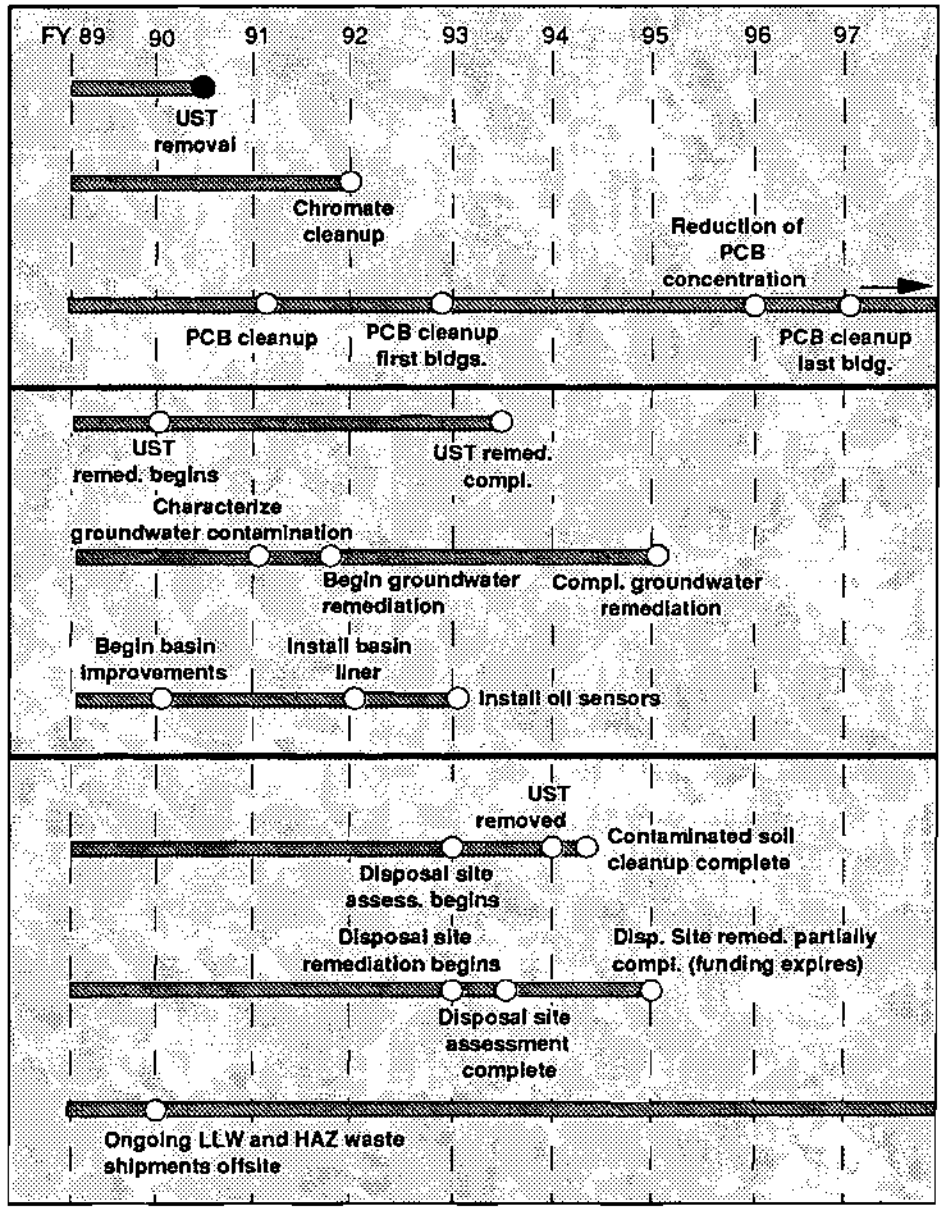
MAJOR MILESTONES

Corrective Activities	Date
• Submit polychlorinated biphenyl (PCB) cleanup risk assessment to EPA for review (Fermi).	FY 1991
• Submit closure proposal to Idaho EPA for review (Fermi).	FY 1992
Waste Management	
• Dispose of PCB transformers (Fermi).	FY 1991
• Complete Waste Minimization Assessments (Fermi, PPPL, Ames).	FY 1992
• Install basin liners at PPPL.	FY 1992
Environmental Restoration	
• Complete PCB cleanup (Fermi).	FY 1991
• Complete risk assessment on potential chromate contamination at Fermi and submit report to EPA.	FY 1991
• Complete Ames Chemical Disposal Site Characterization.	FY 1993
• Complete contaminated soil (diesel fuel) removal at Ames.	FY 1993

Progress Chart for Chicago Field Office: Combined Laboratories*

Long-Term Objectives:
Maintain waste treatment, storage, and disposal operations in support of site mission
Implement aggressive waste minimization program

Five-Year Objectives:
Bring all sites into compliance with applicable regulations
Complete all planned remediation activities



Legend
- ○ Planned Milestones
- ● Completed Milestones
- → Material Flows
- ▬ Activities

Acronyms and Initialisms
UST- Underground Storage Tank
LLW- Low-Level Waste
HAZ- Hazardous

*For Validated Target Level

STATUS/ACCOMPLISHMENTS

Corrective Activities

- Assessment and/or cleanup of pollutant spills/releases is under way at all sites (Fermi, PPPL, Ames). The Main Ring PCB assessment and Actuation Product Release Assessment were completed at Fermi.
- Work is under way to remove, replace, and upgrade USTs at all sites. The Site 55 leaking UST (Fermi) was excavated and the tank removed.

Waste Management

- Waste operations activities are continuing at all sites; shipments to offsite waste disposal facilities have begun.
- Waste Minimization plans have been prepared for all facilities.

Environmental Restoration

- The risk assessment for residual contamination from chromate contamination at Fermi was submitted to EPA.

ISSUES

- There is potential for contamination of groundwater with organic, inorganic, and/or radioactive contaminants (Ames).

Funding: Validated Target Level ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	512	163	1,720	0	0	0	0	2,395
FY92	0	839	0	2,386	0	14	0	0	3,239
FY93	0	0	0	3,138	243	207	240	240	4,068
FY94	0	0	0	3,976	0	0	250	705	4,931
FY95	0	0	0	3,875	0	0	0	0	3,875
FY96	0	0	0	4,059	0	0	0	0	4,059
FY97	0	0	0	4,146	0	0	0	0	4,146
FY93-97	0	0	0	19,194	243	207	490	945	21,079

Funding: Preliminary Unvalidated Case ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	512	163	1,720	0	0	0	0	2,395
FY92	0	839	0	2,386	0	14	0	0	3,239
FY93	0	0	0	5,563	243	207	340	340	6,693
FY94	0	0	0	4,063	0	0	410	865	5,338
FY95	0	0	0	3,839	0	0	0	0	3,839
FY96	0	0	0	3,590	0	0	0	0	3,590
FY97	0	0	0	3,758	0	0	0	0	3,758
FY93-97	0	0	0	20,813	243	207	750	1,205	23,218

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.

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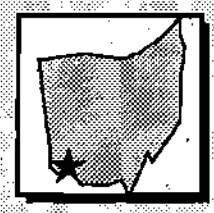


FERNALD SITE OFFICE
INSTALLATION SUMMARY
FEED MATERIALS PRODUCTION CENTER

FACILITY DESCRIPTION

Feed Materials Production Center (FMPC) near Fernald, Ohio, northwest of Cincinnati, is a large-scale facility where the primary mission from the early 1950s until July 1989 was the production of uranium metals and compounds. Cleanup of the 1,050-acre site and the supporting waste management functions now constitute the major site activities. FMPC was placed on the National Priorities List in November 1989, and the site cleanup is being conducted under CERCLA. Cleanup at the Reactive Metals, Inc. (RMI) Extrusion Plant in Ashtabula, Ohio, is being performed in conjunction with these activities.

MAJOR MILESTONES

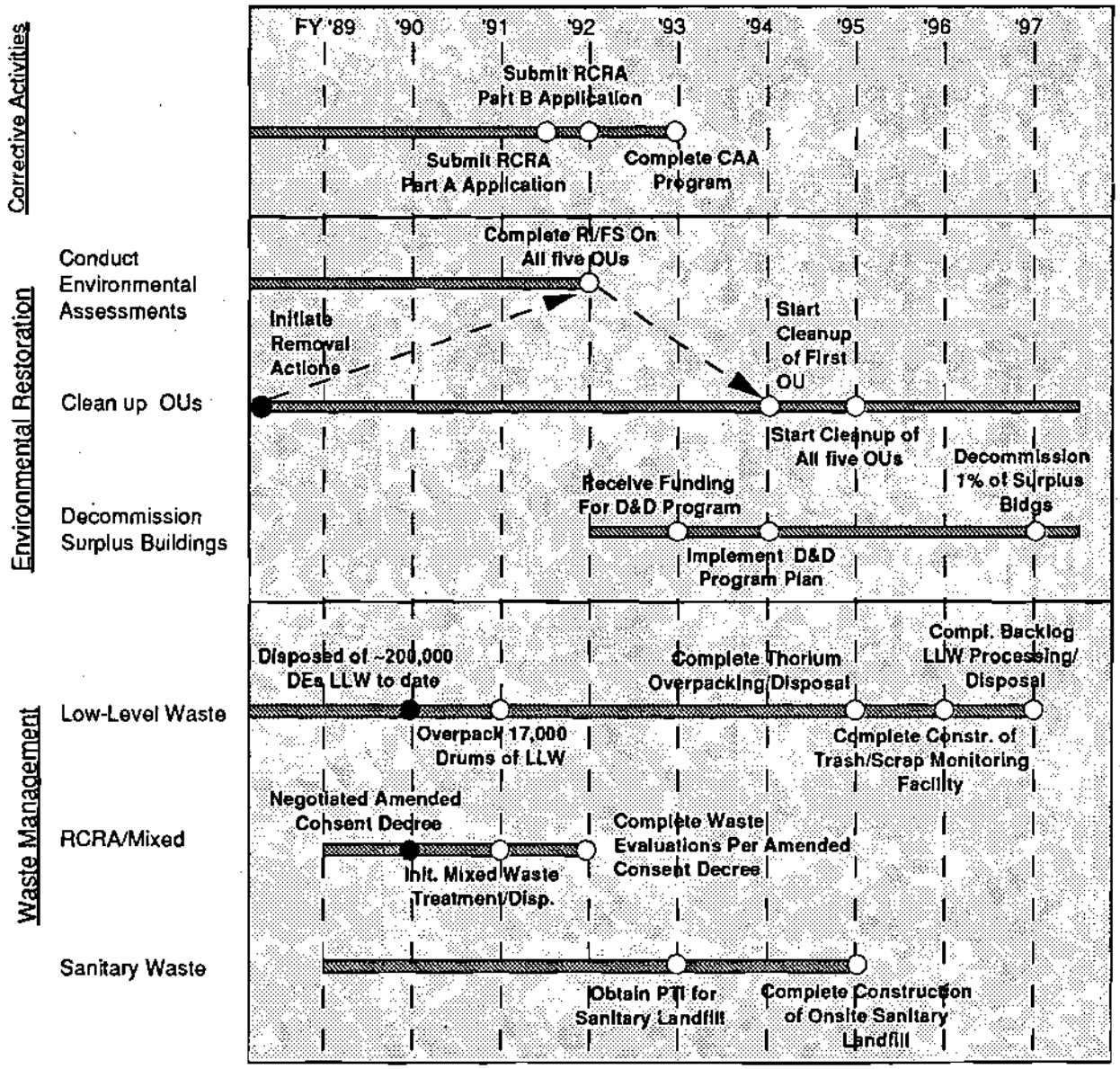
Environmental Restoration	Date*
• Draft Record of Decision - Operable Unit (OU) 4.	4Q FY 1991
• Overpack 17,000 drums of LLW.	4Q FY 1991
• Complete RCRA Part B Permit Application.	1Q FY 1992
• Complete Wastewater Interim Treatment Operation.	1Q FY 1992
• Complete construction and startup of Waste Pit Area Runoff Control.	1Q FY 1992
• Submit Remedial Design Work Plan to EPA - first OU.	3Q FY 1992
• Submit Remedial Action Work Plan to EPA - first OU.	3Q FY 1992
• Complete Waste Evaluations per the Amended Consent Decree.	4Q FY 1992
• Submit Remedial Design Work Plan to EPA - last OU.	4Q FY 1992
• Submit Remedial Action Work Plan to EPA - last OU.	1Q FY 1993
• Initiate Remedial Actions - first OU.	2Q FY 1993
• Initiate Remedial Actions - last OU.	4Q FY 1993
• Complete Clean Air Act Program.	4Q FY 1993
• Complete thorium overpacking/disposal.	4Q FY 1994
• Complete remediation for first waste unit - OU 2.	1Q FY 1995
• Complete backlog low-level waste (LLW) processing/disposal.	1Q FY 1996
• Complete remediation - first OU.	1Q FY 1997
• Complete remediation for remaining waste units - OU 2.	4Q FY 1997

*Milestone dates are currently under negotiations with EPA and the State of Ohio.

Progress Chart for Fernald Site Office: Feed Materials Production Center *

Long-Term Objectives:
Clean up all OUs by FY 2020
Decommission all surplus building by FY 2015

Five-Year Objectives:
Dispose of all backlog LLW
Complete RI/FS on all five OUs
Complete identified removal actions
Begin remedial design on all five OUs



Legend

- ○ Planned Milestones
- ● Completed Milestones
- - - ► Information Flows
- ▬ Activities

Acronyms and Initialisms

CAA- Clean Air Act
D&D- Decontamination and Decommissioning
DEs- Drum Equivalents
LLW- Low-Level Waste
PTI- Permit to Install
RI/FS- Remedial Investigation/Feasibility Study

*For Validated Target Level

STATUS/ACCOMPLISHMENTS

Corrective Activities

- RCRA Compliance Plan was submitted.
- A detailed sampling plan and schedule for wastes were developed and implemented.
- Underground storage tanks have been removed.

Waste Management

- Disposed of 24,420 drum equivalents (180,000 ft^3) of LLW in FY 1990.
- Extensive RCRA sampling and analyses activities were initiated per the proposed Amended Consent Decree.
- More than 13,000 drums of LLW were overpacked in FY 1990.
- A program was implemented to decontaminate contaminated scrap metal.

Environmental Restoration

- A Consent Agreement is being implemented under CERCLA Sections 120 and 106; the Consent Agreement Schedule is currently being negotiated between DOE and EPA.
- Each of the five OUs has an RI/FS in progress.
- The Administrative Record file for the FMPC has been established and is located offsite to allow easy access by the public.
- Several removal actions are planned and in progress, and several have been implemented.
- A National Environmental Policy Act (NEPA) program was developed and implemented.
- A Safety Analysis Report to cover the site transition from production to shutdown is being developed.
- Site services are provided, such as maintenance, transportation, and utilities, to support the site programs.

ISSUES

Applicable Regulations, Orders, and Agreements

CERCLA	NPDES
RCRA	CWA
DOE Orders	CAA
CERCLA Consent Agreement under Sections 120 and 106	OSHA
Consent Decree and Amendments	NIOSH
TSCA	FOIA
NEPA	SARA

Environmental, Health and Safety Risk

- Integration of CERCLA requirements with the Consent Decree.
- Laboratory capability for environmental samples is lacking and may delay certain site certification activities.
- Uranium contamination of groundwater, soils, and buildings at the FMPC and RMI.
- FMPC wastes include raffinate slurries containing uranium and radium; wastewaters and various wastes contaminated with uranium and thorium; pyrophoric; reactive chemicals; oils contaminated with uranium; and organic solvents.
- Fields Brook, which is adjacent to RMI, contains polychlorinated biphenyls, chlorinated solvents, toxic metals, and trichloroethylene.
- Lack of basic site services will threaten shutdown of site operations and delay of CERCLA cleanup and waste management, thereby increasing risk of environmental insult.
- High-hazard asbestos-deteriorated materials exist onsite.
- Waste pit air and water contamination.
- Deterioration of storm sewers and integrity of wastewater treatment.
- Current thorium container/facility integrity.
- Outdoor deteriorated LLW containers.
- Contaminated scrap metal piles.

Funding: Validated Target Level ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	48,464	0	33,682	0	92,118	0	87,868	0	262,132
FY92	0	0	0	0	129,848	0	105,043	0	234,891
FY93	0	0	0	0	143,144	0	191,747	0	334,891
FY94	0	0	0	0	139,799	0	231,351	0	371,150
FY95	0	0	0	0	137,671	0	255,080	0	392,751
FY96	0	0	0	0	109,980	0	306,776	0	416,756
FY97	0	0	0	0	108,361	0	333,275	0	441,636
FY93-97	48,464	0	33,682	0	860,921	0	1,511,140	0	2,454,207

Funding: Preliminary Unvalidated Case ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	48,464	0	33,682	0	92,118	0	87,868	0	262,132
FY92	0	0	0	0	129,848	0	105,043	0	234,891
FY93	0	0	0	0	159,815	0	312,162	0	471,977
FY94	0	0	0	0	139,799	0	368,578	0	508,377
FY95	0	0	0	0	121,633	0	429,367	0	551,000
FY96	0	0	0	0	109,981	0	367,652	0	477,633
FY97	0	0	0	0	108,362	0	309,901	0	418,263
FY93-97	48,464	0	33,682	0	861,556	0	1,980,571	0	2,924,273

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.

IDAHO FIELD OFFICE
INSTALLATION SUMMARY
GRAND JUNCTION PROJECTS OFFICE SITE

FACILITY DESCRIPTION

Idaho Field Office Grand Junction Projects Office is located on a 56-acre site adjacent to the Gunnison River in Western Colorado immediately south of the City of Grand Junction, Colorado (population 28,500). The Grand Junction Projects Office primarily applies project management, engineering, and geoscience expertise to support the DOE Environmental Restoration process. Major programs include Uranium Mill Tailings Remedial Action (UMTRA) Grand Junction Vicinity Properties (GJVP) Project, Monticello Millsite and Vicinity Properties National Priorities List (NPL)-listed sites being remediated under the authority of CERCLA, Decontamination and Decommissioning at the Grand Junction Projects Office (GJPO) site, and surveillance and maintenance of completed Title I disposal sites.

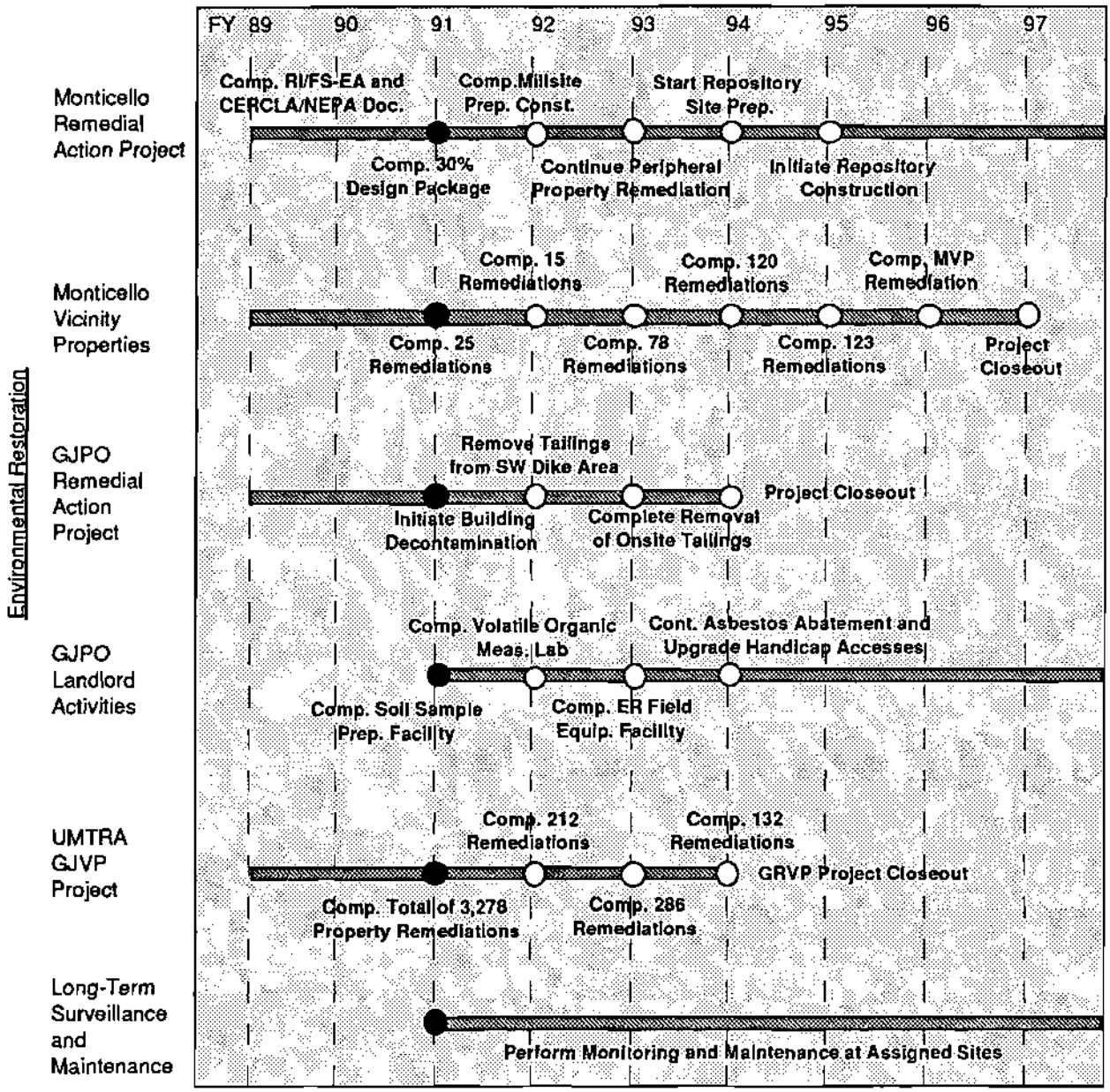
MAJOR MILESTONES

Environmental Restoration:	Date
UMTRA Project	
• Complete 286 construction activities (start 1Q FY 1993).	4Q FY 1993
• Complete 132 construction activities (start 1Q FY 1993).	4Q FY 1993
• Close out GJVP (start 1Q FY 1994).	4Q FY 1994
Monticello Remedial Action Project	
• Complete 90 percent design package for the repository (start 1Q FY 1991).	1Q FY 1993
• Complete millsite and repository site preparation activities (start 2Q FY 1992).	3Q FY 1995
• Complete tailings removal to repository (start 3Q FY 1994).	4Q FY 1996
GJPO Remedial Action Project	
• Complete remedial action (start 1Q FY 1990).	4Q FY 1992
Monticello Vicinity Properties	
• Complete 78 construction activities (start 1Q FY 1992).	4Q FY 1992
• Complete 120 construction activities (start 1Q FY 1993).	4Q FY 1993
• Complete 123 construction activities (start 1Q FY 1994).	4Q FY 1994
• Complete 88 construction activities (start 1Q FY 1995).	4Q FY 1995
Long-Term Surveillance & Maintenance	
• Provide prelicensing custodial care of Nuclear Regulatory Commission (NRC)-licensed Title 1 UMTRA disposal sites (start 1Q FY 1991).	4Q FY 1997
• Perform long-term surveillance and maintenance at designated sites (start 1Q FY 1994).	Ongoing

Progress Chart for
Idaho Field Office: Grand Junction Projects Office Site *

Long-Term Objectives:
Complete Monticello Remedial Action Project
Continue Monitoring Title I Long-Term Surveillance Sites

Five-Year Objectives:
Complete UMTRA GJVP Project
Complete GJPO Remedial Action Project
Complete MVP



Legend
- ○ Planned Milestones
- ● Completed Milestones
- ▬ Activities

Acronyms and Initialisms

EA-	Environmental Assessment	RI/FS-	Remedial Investigation/ Feasibility Study
ER-	Environmental Restoration	SW-	Sanitary Waste
GJVP-	Grand Junction Vicinity Projects		
MVP-	Monticello Vicinity Properties		
NEPA-	National Environmental Policy Act		

*For Validated Target Level

STATUS/ACCOMPLISHMENTS

Environmental Restoration

- All major milestones listed in the FY 1992-1996 Five-Year Plan were accomplished.
- Completed radiologic and engineering design on 3,889 UMTRA properties.
- Began construction on 3,411 UMTRA properties.
- Completed construction activities on 3,278 UMTRA properties.
- Issued a CERCLA Record of Decision (ROD) on MVP on November 29, 1989.
- Remediated 90 MVP.
- Issued a ROD on GJPO Remedial Action Projects for the selected remedy on April 30, 1990.
- Issued a CERCLA ROD on Monticello Remedial Action Projects on September 20, 1990.

ISSUES

Regulatory Drivers

- PL-95-604 of the Uranium Mill Tailings Radiation Control Act.
- 40 CFR 192 (Because of a Federal court remand, EPA has issued draft UMTRA standards for groundwater protection. DOE is attempting to comply with these standards even though they have not been finalized.).
- PL 100-616 of the Uranium Mill Tailings Remedial Action Amendments Act of 1987.
- Applicable State regulations.
- Written agreement with the Colorado Department of Health on the GJPO Remedial Actions.
- Federal Facilities Agreement (FFA) for Monticello Remedial Action Project/MVP.

Health Risks

- Unremediated vicinity properties can expose occupants of residential and commercial structures to unacceptable levels of radon gas, radon decay products, and gamma radiation.
- Residual radioactive materials from earlier uranium milling operations at the GJPO and Monticello, Utah, can pose potential, near-and long-term health risks to offsite residents through groundwater contamination and potential surface water contamination.
- If disposal sites deteriorate before licensing, then the NRC can be expected to postpone licensing until sites are restored.

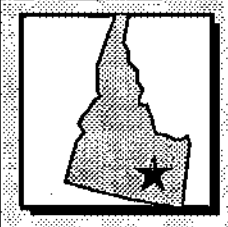
Funding: Validated Target Level ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	0	0	0	900	2,339	8,162	31,071	42,472
FY92	0	0	0	0	0	3,956	4,723	42,674	51,353
FY93	0	0	0	0	300	5,057	300	40,091	45,748
FY94	0	0	0	0	991	4,975	0	15,751	21,717
FY95	0	0	0	0	778	3,785	0	10,189	14,752
FY96	0	0	0	0	696	1,691	0	9,130	11,517
FY97	0	0	0	0	617	1,314	0	8,371	10,302
FY93-97	0	0	0	0	3,382	16,822	300	83,532	104,036

Funding: Preliminary Unvalidated Case ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	0	0	0	900	2,339	8,162	31,071	42,472
FY92	0	0	0	0	0	3,956	4,723	42,674	51,353
FY93	0	0	0	0	5,610	5,057	300	48,658	59,625
FY94	0	0	0	0	4,400	5,256	0	29,513	39,169
FY95	0	0	0	0	3,367	4,547	0	23,458	31,372
FY96	0	0	0	0	2,134	3,034	0	13,545	18,713
FY97	0	0	0	0	2,056	2,390	0	1,435	5,881
FY93-97	0	0	0	0	17,567	20,284	300	116,609	154,760

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.



IDAHO FIELD OFFICE
INSTALLATION SUMMARY
IDAHO NATIONAL ENGINEERING LABORATORY

FACILITY DESCRIPTION

The Idaho National Engineering Laboratory (INEL), situated in southern Idaho along the western edge of the Eastern Snake River Plains, encompasses an area of approximately 890 miles^2 of desert. The nearest major community is Idaho Falls (population 46,000), located 42 miles southeast of INEL. Activities at INEL include the operation of nuclear reactors, a fuel processing plant, waste management facilities, and other supporting facilities. At INEL, approximately 350 waste management units are combined into 10 Waste Area Groupings where characterization and eventual remediation will occur. Decontamination and decommissioning (D&D) activities are ongoing at eight facilities. INEL was placed on the National Priorities List (NPL) in 1989, which requires the CERCLA cleanup of at least three listed sites.

MAJOR MILESTONES

Corrective Activities

Date

A top priority at INEL is to bring laboratory facilities into compliance with applicable local, State, and Federal regulations. In that effort, Corrective Activities have been established to eliminate contaminant discharges to the soil, upgrade waste transfer lines, and modify or replace underground storage tanks.

- Install secondary containment for liquid waste tank and upgrade the CPP-627 analytical laboratory drain system. — 4Q FY 1992

Waste Management

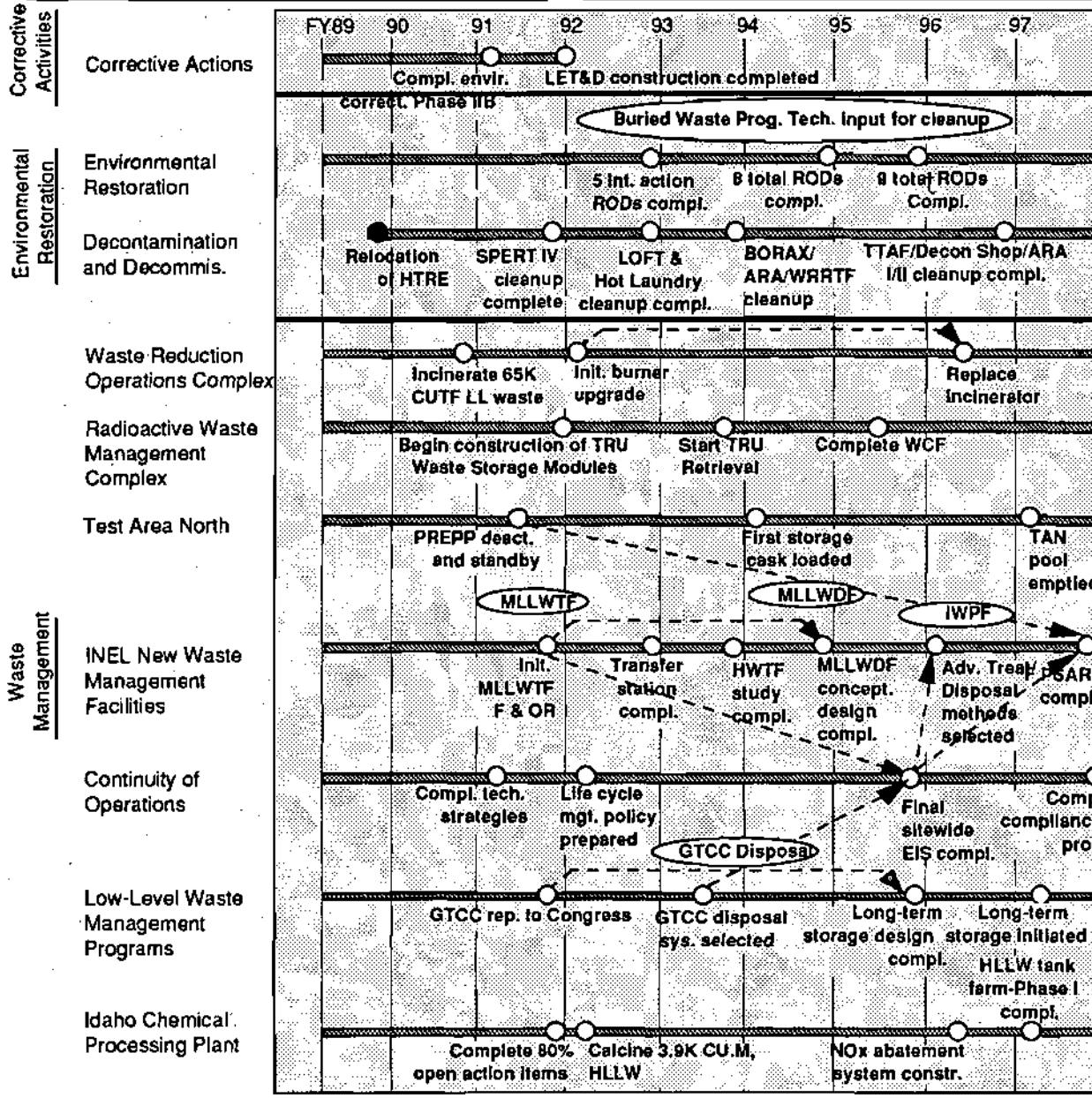
Waste management efforts at INEL are directed toward safe and environmentally sound treatment, storage, and disposal of radioactive, hazardous, and sanitary waste generated from facility operations.

- Deactivation of Process Experimental Pilot Plant (PREPP), facility placed on standby. — 2Q FY 1991
- Begin construction of transuranic (TRU) Waste Storage Modules. — 4Q FY 1991
- Startup of the Liquid Effluent Treatment and Disposal facility. — 1Q FY 1992
- Complete Municipal Solid Waste Transfer Station. — 1Q FY 1993
- Recommend a complexwide Greater-Than-Class-C (GTCC) Disposal Site. — 3Q FY 1993
- Initiate Three-Mile Island cask Fabrication and Dry Storage Program. — 2Q FY 1995
- Complete construction of TRU Characterization and Storage Facility. — 2Q FY 1995
- Complete final INEL sitewide Environmental Impact Statement (EIS). — 4Q FY 1995
- Support Waste Isolation Pilot Plant Bin Test Program. — 4Q FY 1995
- Replace incinerator combustion chambers at the Waste Experimental Reduction Facility (WERF). — 2Q FY 1996
- Construct and startup a full-scale NOx abatement facility. — 4Q FY 1996
- Prepare Idaho Waste Processing Facility (IWPF) Preliminary Safety Analysis Report. — 4Q FY 1997
- Install and place into service four high-level liquid waste (HLLW) storage tanks. — 2Q FY 1999

Progress Chart for Idaho Field Office: Idaho National Engineering Laboratory*

Long-Term Objectives:
Complete Environmental Restoration of the INEL
Send all stored waste/fuel to repositories

Five-Year Objectives:
Complete Corrective Activities
Start Stored TRU Retrieval
Complete Construction of HLLW Tank Farm-Phase 1



Legend

- ○ Planned Milestones
- ● Completed Milestones
- - - ▶ Information Flows
- (text) Technology Input
- ▒ Activities

Acronyms and Initialisms

ARA-Auxiliary Reactor Area
BORAX-Boiling Water Reactor Experiment
F&OR-Functional and Operational Requirements
GTCC-Greater than Class C
HLLW-High-Level Liquid Waste
HTRE-Heat Transfer Reactor Experiment
HWTF-Hazardous Waste Treatment Facility
IWPF-Idaho Waste Processing Facility
LET&D-Liquid Effluent Treatment and Disposal
LLW-Low-Level Waste
LOFT-Loss of Fluid Test
MLLWDF-Mixed Low-Level Waste Disposal Facility
MLLWTF-Mixed Low-Level Waste Treatment Facility
PREPP-Process Experimental Pilot Plant
PSAR-Preliminary Safety Analysis Report
ROD-Record of Decision
SPERT-Special Power Excursion Reactor Test
TTAF-Test Train Assembly Facility
WCF-Waste Calcining Facility
WRRTF-Water Reactor Research Test Facility

*For Validated Target Level

Environmental Restoration

• Complete five Interim Action (IA) Records of Decisions (RODs).	4Q FY 1992
• Complete Idaho Chemical Processing Plant (ICPP) preliminary scoping activities.	3Q FY 1993
• Complete ICPP Existing Data Review.	4Q FY 1993
• Complete cleanup at five sites.	4Q FY 1993
• Complete three additional RODs.	4Q FY 1994
• Complete one additional ROD.	4Q FY 1995
• Complete cleanup at three additional sites.	4Q FY 1996

Technology Development

• New Facilities Technology Development.	1991-1997
• GTCC Technology Development.	1993-1995
• Buried Waste Technology Development.	1993-1997

Landlord Activities

The Waste Management Decision Unit includes the Idaho Landlord Infrastructure. Landlord responsibilities include maintaining sitewide infrastructure through central planning, maintenance, procurement of General Purpose Equipment, and construction of common-use facilities, utilities, and roads.

• Complete sewer system construction.	2Q FY 1995
• Complete construction of transportation complex.	1Q FY 1996
• Complete construction of fire and life safety improvements.	2Q FY 1996
• Complete electrical upgrade.	3Q FY 1996
• Construct radio communications facilities.	2Q FY 1997
• Complete INEL Training Facility.	3Q FY 1997
• Replace RESL Laboratory.	3Q FY 1997
• Complete Central Facilities Area Office building.	4Q FY 1997
• Complete INEL Research Center Laboratory.	4Q FY 1997

STATUS/ACCOMPLISHMENTS

Corrective Activities

- Completed Waste Characterization and Implementation Plan.
- Completed repairs on new waste calcining facilities to resume calcining HLLW.

Waste Management

• Restarted the NOx abatement pilot plant for testing.	4Q FY 1990
• Complete TRU Retrieval Enclosure Design.	4Q FY 1990
• Restarted the new waste calcining facility.	1Q FY 1990
• Completed deactivation of PREPP.	2Q FY 1991
• Completed TRUPACT II Readiness Review.	4Q FY 1991

Environmental Restoration

• Completed BORAX V asbestos removal.	4Q FY 1990
• Removed 27 inactive underground storage tanks.	4Q FY 1990
• Started prototype NaK processing.	4Q FY 1990
• Submitted nine Closure Plans [1 for Test Area North (TAN), 1 for Test Reactor Area (TRA), 4 for ICPP, 3 for Power Burst Facility/Auxiliary Reactor Area].	4Q FY 1990
• Submitted 22 summary assessments. (10 for TAN, 3 for TRA, 6 for ICPP)	4Q FY 1990
• Completed TAN injection well sludge cleanup.	4Q FY 1990
• Completed Vapor Vacuum Extraction Demonstration.	4Q FY 1990
• Delisted 27 Consent Order Compliance Agreement (COCA) sites.	4Q FY 1990
• Commenced cleanup of ICPP polychlorinated biphenyl (PCB)-contaminated sites.	2Q FY 1991
• Concluded Interagency Agreement (IAG) negotiations.	4Q FY 1991
• Submitted Draft TRA Warm Waste Sediments Pond ROD for review.	3Q FY 1991
• Commenced removal/disposition of transit asbestos at ICPP.	3Q FY 1991
• Completed cleanup of Special Power Excursion Reactor Test (SPERT) IV Ancillaries.	4Q FY 1991
• Met Consent Order and Compliance Agreement requirements (COCA) at ICPP.	4Q FY 1991
• Completed NaK processing.	1Q FY 1992

Landlord Activities

• Completed INEL Security Upgrade.	3Q FY 1990
• Completed INEL Communications Upgrade.	3Q FY 1990
• Refined General Plant Project (GPP) prioritization process.	3Q FY 1990
• Completed INEL road renovation.	4Q FY 1991

ISSUES

Waste Management

The following issues require resolution:

- Reduced funding will limit or delay INEL's ability to come into compliance with OSHA, RCRA, and DOE requirements at all INEL facilities.
- TMI spent fuel and core debris will remain a safety concern.
- New facilities are required to ensure compliance with applicable regulations and to provide proper long-term treatment, storage, and disposal options.
- Completion of sitewide EIS will be completed in FY 1996 instead of FY 1995.
- Maintenance backlog at Waste Management facilities will be increased.
- Partial support to new treatment facilities.
- Startup of the Liquid Effluent Treatment and Disposal facility will begin in FY 1994 instead of FY 1993.
- Prolong compliance with newly issued DOE Orders.
- Conceptual design for additional calcine bin sets will be rescheduled to FY 1996.

Environmental Restoration

Of the 319 identified waste management units at INEL, three have been confirmed to involve releases of hazardous constituents. Site contaminants that might be released include petroleum products, acids, bases, solvents, heavy metals, radionuclides, PCBs, and asbestos. INEL was placed on the NPL because of volatile organic and chromium concentrations in groundwater in excess of drinking water standards. Potential risks to employees at INEL TAN, primarily through drinking water, have been mitigated. The extent of contamination at the D&D facilities ranges from radionuclides to mixed hazardous wastes. Facilities on the D&D list not undergoing cleanup are in the surveillance and maintenance program to ensure safe containment of contaminants. Regulatory authorities are the Idaho State Department of Health and Welfare and EPA Region X. Applicable regulations are the RCRA-based COCA between the EPA Region X and DOE and the CERCLA IAG among DOE, EPA, and the State of Idaho, which will supersede COCA when executed.

Landlord Activities

- Partial support for Site Facility Maintenance Restoration increasing backlog of maintenance repairs.
- GPCE Restoration and Modernization Program will be partially supported.
- GPP activities will be prolonged, requiring a bow wave of activities in outyears.
- Emergency Preparedness capital equipment will be rescheduled to FY 1994.
- Partial support for INEL Fire and Safety improvements.

Funding: Validated Target Level ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	13,978	0	234,134	0	43,568	0	4,698	0	296,378
FY92	7,000	0	248,197	0	43,361	410	11,916	1,390	312,274
FY93	0	0	320,041	0	44,008	144	11,260	1,665	377,118
FY94	0	0	351,550	0	49,046	3,262	16,342	2,475	422,675
FY95	0	0	387,894	0	51,223	766	24,423	1,051	465,357
FY96	0	0	406,028	0	45,048	0	32,806	1,930	485,812
FY97	0	0	421,874	0	51,780	0	32,070	0	505,724
FY93-97	0	0	1,887,387	0	241,105	4,172	116,901	7,121	2,256,686

Funding: Preliminary Unvalidated Case ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	13,978	0	234,134	0	43,568	0	4,698	0	296,378
FY92	7,000	0	248,197	0	43,361	410	11,916	1,390	312,274
FY93	0	0	373,719	0	64,039	135	12,715	1,665	452,273
FY94	0	0	442,992	0	70,966	0	19,994	4,430	538,382
FY95	0	0	389,258	0	61,493	0	43,944	1,051	495,746
FY96	0	0	405,087	0	60,070	0	81,836	0	546,993
FY97	0	0	439,182	0	64,277	0	33,349	0	536,808
FY93-97	0	0	2,050,238	0	320,845	135	191,838	7,146	2,570,202

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.

IDAHO FIELD OFFICE
INSTALLATION SUMMARY
WEST VALLEY DEMONSTRATION PROJECT OFFICE

FACILITY DESCRIPTION

The West Valley Demonstration Project (WVDP) is carried out at the Western New York Nuclear Service Center (WNYNSC) located in Cattaraugus County, near West Valley, New York. The WVDP Act (PL 96-368) was enacted to demonstrate solidification that can be used to prepare high-level radioactive waste (HLW) for disposal. Waste management programs at the site include waste minimization, reduction, treatment, and storage. Other site activities include programs for site characterization, site cleanup, decontamination and decommissioning of facilities, and shipment of HLW to the repository. Currently the project is stressing continued waste management and waste cleanup in a safe and effective manner that protects the general public, plant employees, and the environment.

MAJOR MILESTONES

Waste Management	Date
• Submit WVDP RCRA Part A Application Permit for mixed waste.	3Q FY 1990
• Negotiate a manageable Federal State Facilities Compliance Agreement (FSFCA) and RCRA 3008(h).	4Q FY 1991
• Select contractor for Phase II Environmental Impact Statement (EIS).	4Q FY 1992
• Issue Vitrification Operational Readiness Review Board (ORRB) checklist.	4Q FY 1993
• Complete the vitrification construction.	4Q FY 1994
• Publish Phase II EIS.	2Q FY 1995
• Start vitrification hot operations.	2Q FY 1996
• Publish Record of Decision on Phase II EIS.	1Q FY 1996
• Complete vitrification hot operations.	4Q FY 1998
• Prepare comprehensive Project Completion Plan.	4Q FY 1999

STATUS/ACCOMPLISHMENTS

Waste Management

- The WVDP is reducing in volume 660,000 gallons of HLW before solidifying the HLW for disposal.
- Low-level waste (LLW) produced in concentration of the HLW activity is solidified and placed in long-term storage onsite.
- An expanded environmental monitoring program has been developed to achieve full compliance with DOE Order 5400.1.
- A continuing effort in FY 1991 is construction in preparation for operation of the vitrification facility. The major emphasis is completion of the civil/structural (nonseismic) modifications to existing component test stand.
- In FY 1991 and FY 1992, portions of the melter jumpers will be fabricated and stored. The process off-gas system will be fabricated and delivered, and long-lead procurement items will be placed on order.
- Activities for FY 1991 are completion of design, procurement, installation, and testing of the sludge washing equipment.
- Waste form qualification and associated process qualification activities will continue.

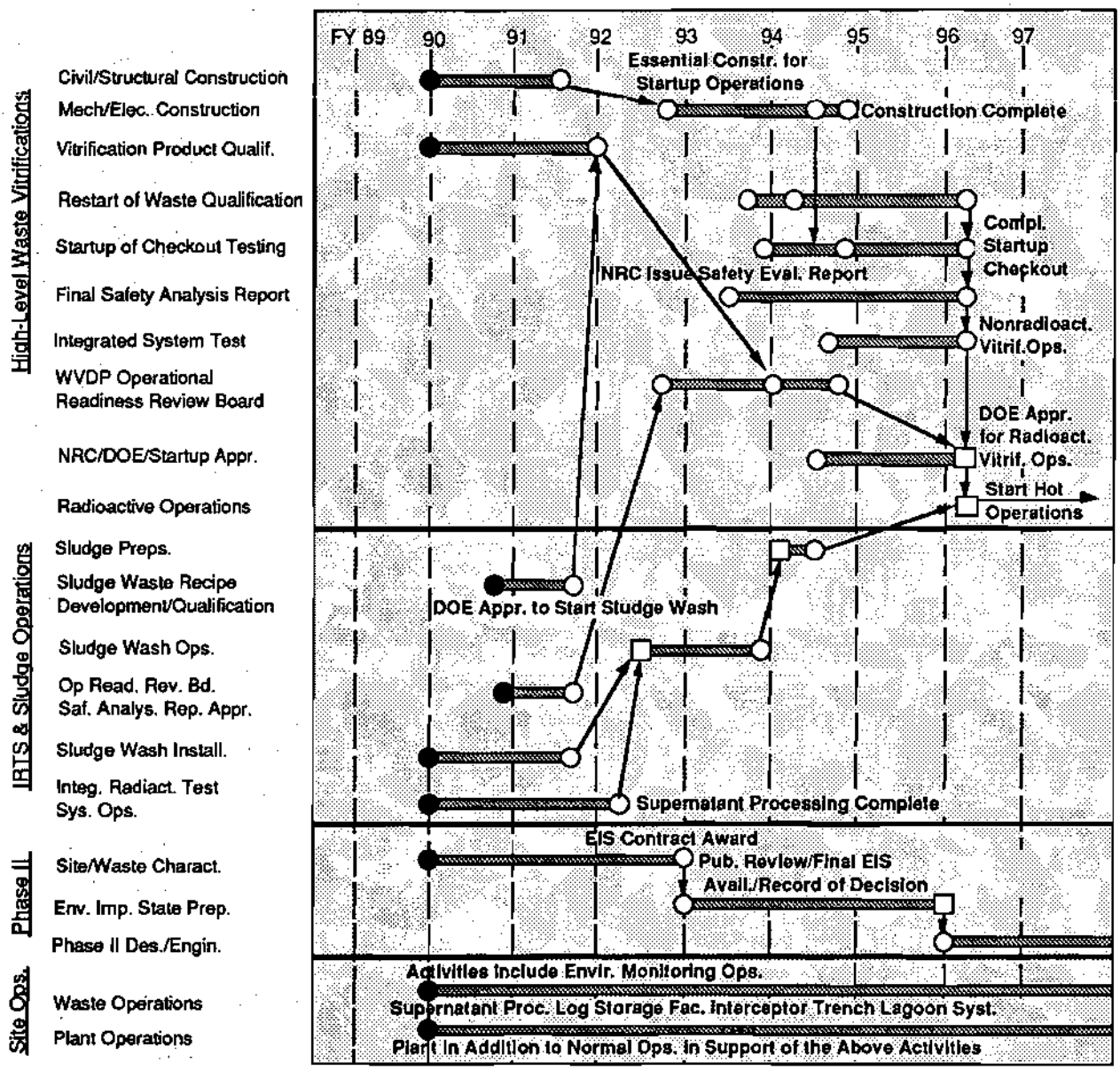
Progress Chart for Idaho Field Office: West Valley Demonstration Project*

Long-Term Objectives:

Complete Vitrification of High-Level Waste (FY 1998)
Complete Decontamination and Decommissioning of the Facility (FY 2023)
Turn over the Facility to New York State for site closure (FY 2024)

Five-Year Objectives:

Negotiate a manageable FSFCA and 3008(h) Order (FY 1991)
Publish Phase II EIS (FY 1995)
Start vitrification radioactive operations (FY 1996)
Complete final EIS and Record of Decision (FY 1996)



Legend

- ○ Planned Milestones
- ● Completed Milestones
- □ Decision Point
- → Project Flow
- ▬ Activities

Acronyms and Initialisms

EIS- Environmental Impact Statement
IRTS-Integrated Radioactive Test System
NRC-Nuclear Regulatory Commission
WVDP-West Valley Demonstration Project

*For Validated Target Level

- Operational activities at the site in FY 1991 will include continued supernatant processing through the Integrated Radioactive Test Treatment System (IRTS). Environmental monitoring and waste handling will continue throughout the year.
- Environmental site activities, characterization, and planning for the Phase II EIS and postsolidification activities will also continue.
- Processing of supernatant liquid from the HLW tank 8D-2 through the IRTS is expected to be completed early in FY 1992, followed by processing of sludge wash liquid through the IRTS.
- Eighty percent of the HLW was reduced in volume at the end of December 1990. Through December 1990, 10,393 drums of decontaminated supernatant have been processed through the IRTS.
- Construction and equipment installation will continue in preparation for vitrification operations.
- Preparation and filing of a RCRA Part A Permit for radioactive mixed waste was completed by 3Q FY 1990.
- Initiated construction of the Sludge Mobilization System (SMS) pits and trenches.
- Continued site characterization and initiated planning for waste characterization support of preparation for Phase II.

ISSUES

Special Considerations

- Liquid waste in a storage tank presents some risk. Therefore, DOE is committed to proceeding expeditiously to process the HLW in the tanks at WVDP. The tanks are monitored and pose no danger to the general public, workers, or the environment.
- It is assumed that the scope evolving out of FSFCA and RCRA 3008(h) Order will be adequately covered.
- No new regulatory and/or DOE-driven samples.

Regulatory Drivers

- Public Law 96-368.
- Memorandum of Understanding (MOU) between DOE and the Nuclear Regulatory Commission (NRC).
- Cooperative agreement with New York State Energy Research and Development Authority.
- Negotiated agreement between DOE, EPA, and New York State Department of Environmental Conservation (NYSDEC). (Target for reaching this agreement is 4Q FY 1991.)
- Comprehensive Settlement (May 1987) between DOE (defendant) and the Coalition on West Valley Nuclear Waste (plaintiffs), which directs DOE to include LLW and transuranic (TRU) waste disposition in a planned EIS for Phase II operation and project closure.

Regulatory Authorities

- NRC (MOU-1981).
- NYSDEC.
- EPA.

References

- WVDP Major System Acquisition Plan.
- WVDP Project Management Plan.
- WVDP Environmental Protection Implementation Plan.
- WVDP Five-Year Site-Specific Plan.
- WVDP Emergency Plan and Procedures Manual.

Funding: Validated Target Level ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	0	0	79,073	0	0	0	0	79,073
FY92	0	0	0	104,000	0	0	0	0	104,000
FY93	0	0	0	124,000	0	0	0	0	124,000
FY94	0	0	0	126,000	0	0	0	0	126,000
FY95	0	0	0	127,000	0	0	0	0	127,000
FY96	0	0	0	130,000	0	0	0	0	130,000
FY97	0	0	0	135,000	0	0	0	0	135,000
FY93-97	0	0	0	642,000	0	0	0	0	642,000

Funding: Preliminary Unvalidated Case ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	0	0	79,073	0	0	0	0	79,073
FY92	0	0	0	104,000	0	0	0	0	104,000
FY93	0	0	0	134,000	0	0	0	0	134,000
FY94	0	0	0	126,000	0	0	0	0	126,000
FY95	0	0	0	127,000	0	0	0	0	127,000
FY96	0	0	0	130,000	0	0	0	0	130,000
FY97	0	0	0	135,000	0	0	0	0	135,000
FY93-97	0	0	0	652,000	0	0	0	0	652,000

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.

NEVADA FIELD OFFICE
INSTALLATION SUMMARY
NEVADA OFFSITE LOCATIONS

FACILITY DESCRIPTION

Nevada Field Office (NV) manages eight offsite locations that are, or were, used primarily for testing nuclear explosive devices. The purpose of the underground nuclear tests conducted at these sites was to study the potential for gas field stimulation seismic studies related to underground nuclear test detection and warhead development. These sites are located at Amchitka Island, Alaska; Grand Valley and Rifle, Colorado; Carlsbad and Farmington, New Mexico; Hattiesburg, Mississippi; Fallon, Nevada; and the Central Nevada Site near Tonopah, Nevada. The closest site to a major population center is Tatum Dome, which is located 21 miles southwest of Hattiesburg, Mississippi. Pending further clarification as part of the planned negotiations with the States, NV considers CERCLA to be the primary regulatory authority governing any remediation of these sites.

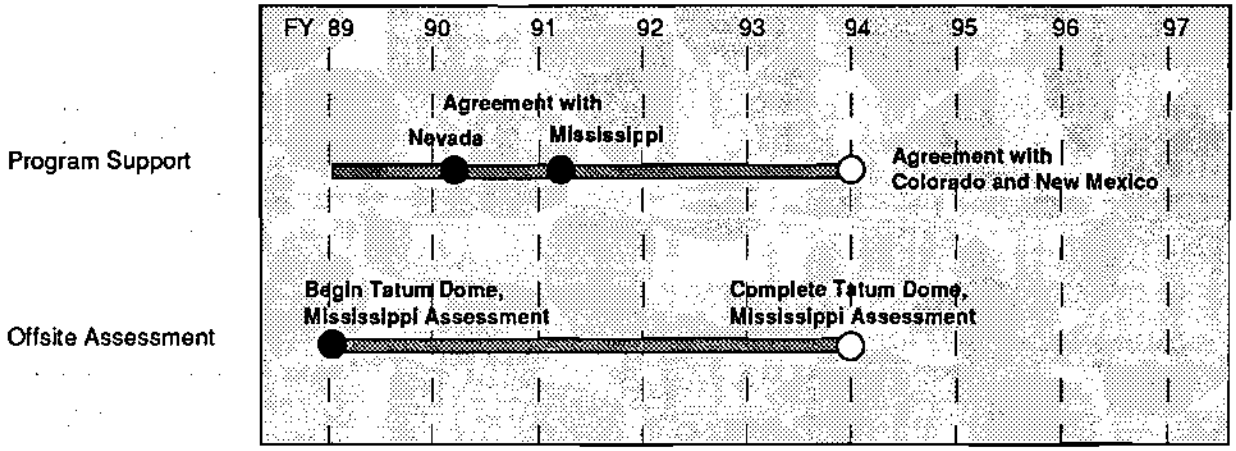
MAJOR MILESTONES

	Date
• Negotiate Interagency Agreement with State of Mississippi (start 1Q FY 1992).	2Q FY 1992
• Negotiate the Superfund Amendments and Reauthorization Act Section 120 Agreement with Alaska, Colorado, and New Mexico (start 1Q FY 1993).	2Q FY 1993
• Complete CERCLA Assessment for Tatum Dome Test Site in Mississippi (start 1Q FY 1993).	1Q FY 1994
• Negotiate Agreement-in-Principle with State of Colorado (start 1Q FY 1994).	4Q FY 1994
• Complete CERCLA Assessment for Nevada offsite locations (start 2Q FY 1992).	4Q FY 1996

Progress Chart for
Nevada Field Office: Nevada Offsite Locations *

Long-Term Objectives:
Enter into agreements with each host state by FY 1994
Clean up all offsite locations by FY 1998

Five-Year Objectives:
Complete program planning by FY 1994
Complete Tatum Dome, Mississippi, assessment by FY 1994



Legend

- ○ Planned Milestones
- ● Completed Milestones
- ▬ Activity

***For Validated Target Level**

STATUS/ACCOMPLISHMENTS

- CERCLA Preliminary Assessments were performed for each offsite location and submitted to the appropriate regulatory authority.
- A draft Remedial Investigation/Feasibility Study Work Plan for the Tatum Dome Test Site was submitted to the Mississippi Regulatory Authority.
- Program plans were further developed through the breakout of individual assessment, oversight, and Federal compliance in each of the five host States.
- The Community Relations Program for the Tatum Dome Test Site was initiated through a series of public meetings at communities in southern Mississippi.
- The preparation of programmatic-level planning documents was initiated to meet DOE requirements.
- A study of health effects near the Tatum Dome Test Site was initiated.

ISSUES

The applicable regulations at NV's offsite locations are the Safe Drinking Water Act, CERCLA, underground injection control programs, and State environmental and waste management laws and regulations.

Historically, cleanup activities were conducted after each test at each site to consolidate and contain residual wastes and byproducts generated during testing operations. In addition, comprehensive monitoring of air, water, and the biological food chain was conducted. The Preliminary Assessments did not find any significant threats to public health or the environment that would require interim remediation under the provisions of CERCLA. No environmental risks were found associated with two sites, the Gasbuggy Stimulation Test Site near Farmington, New Mexico, and the Shoal Test Area near Fallon, Nevada.

Funding: Validated Target Level ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	0	0	0	369	0	0	0	369
FY92	0	0	0	0	1,400	0	0	0	1,400
FY93	0	0	0	0	1,264	0	0	0	1,264
FY94	0	0	0	0	866	0	0	0	866
FY95	0	0	0	0	594	0	0	0	594
FY96	0	0	0	0	596	0	0	0	596
FY97	0	0	0	0	326	0	0	0	326
FY93-97	0	0	0	0	3,646	0	0	0	3,646

Funding: Preliminary Unvalidated Case ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	0	0	0	369	0	0	0	369
FY92	0	0	0	0	1,650	0	0	0	1,650
FY93	0	0	0	0	2,512	0	0	0	2,512
FY94	0	0	0	0	2,490	0	541	0	3,031
FY95	0	0	0	0	972	0	2,705	0	3,677
FY96	0	0	0	0	542	0	7,640	0	8,182
FY97	0	0	0	0	542	0	2,709	0	3,251
FY93-97	0	0	0	0	7,058	0	13,595	0	20,653

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.

NEVADA FIELD OFFICE
INSTALLATION SUMMARY
NEVADA TEST SITE

FACILITY DESCRIPTION

Nevada Field Office (NV) operates the Nevada Test Site (NTS) and historical test areas on the Tonopah Test Range (TTR) and Nellis Air Force Range (NAFR) Area 13. NTS covers approximately 1,350 miles^2 of desert. The closest major population center is Las Vegas, about 65 miles southeast of NTS. NTS primarily conducts belowground nuclear tests and, historically, aboveground nuclear tests. Approximately 800 individual sites were identified that include the belowground and aboveground testing location, ancillary waste disposal sites associated with testing activities, and areas where surficial soils were contaminated with plutonium as a result of safety tests of nuclear devices. Pending further clarification as part of its planned Environmental Restoration (ER) program, NV considers CERCLA to be the primary regulatory authority governing any remediation of the sites. For active tunnel ponds and muck piles that receive waste generated during reentry operations following nuclear tests, RCRA may be the primary regulatory authority.

MAJOR MILESTONES

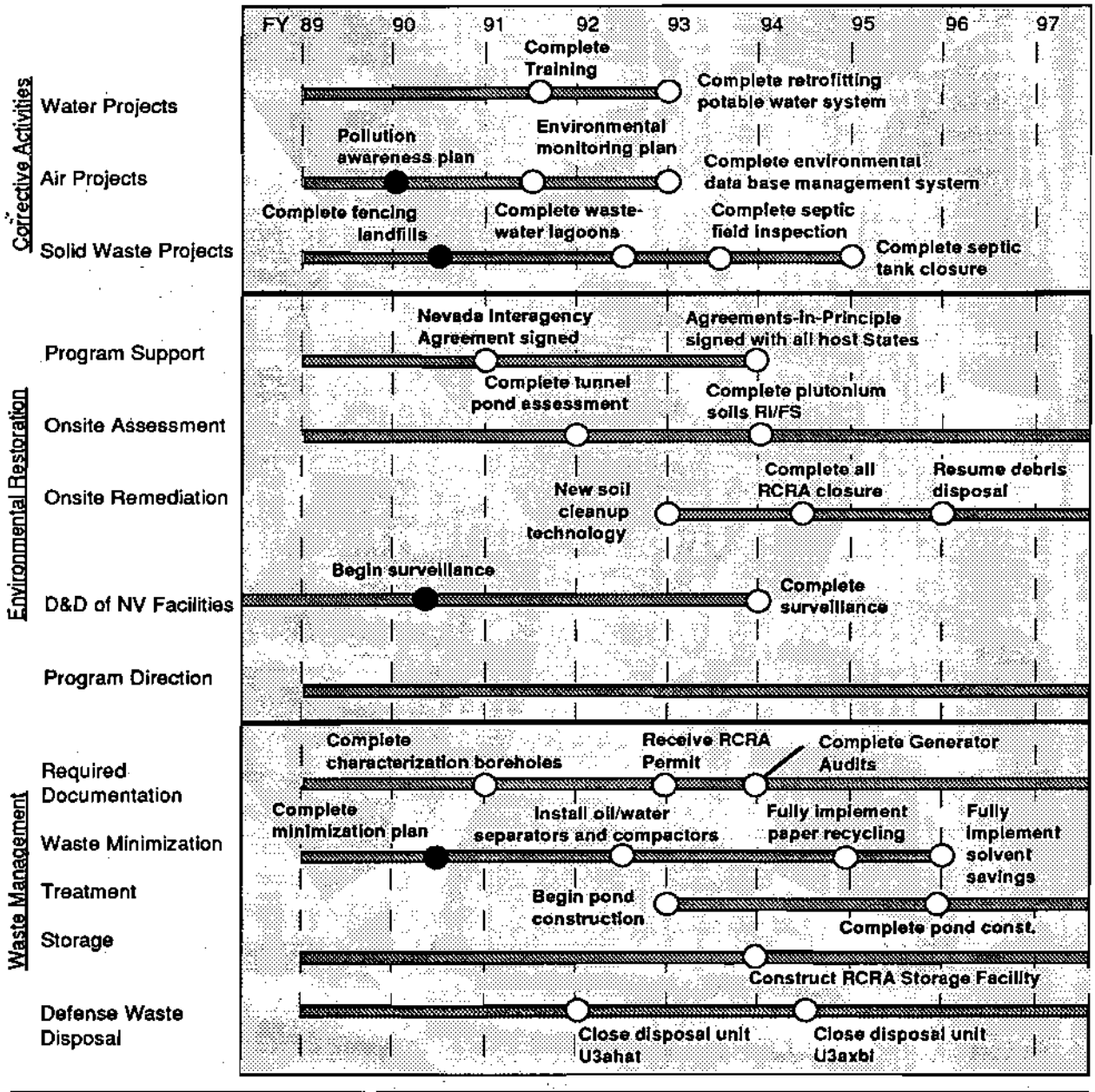
Corrective Activities	Date
• Complete construction of lined pond - Area 6 Facility.	4Q FY 1991
• Implement Environmental Data Base Management Information System.	4Q FY 1992
• Complete environmental upgrades of all landfills.	4Q FY 1992

Waste Management	
• Complete Performance Assessment of Area 5 disposal pits and trenches.	1Q FY 1991
• Complete construction of steam cleaning effluent discharge pads.	4Q FY 1991
• Open New Area 3 Subsidence Crater for low-level waste (LLW) disposal.	2Q FY 1992
• Complete lined pond construction.	4Q FY 1992
• Receive RCRA Mixed Waste Permit from the State of Nevada.	4Q FY 1992
• Initiate characterization and certification activities of Lawrence Livermore National Laboratory (LLNL) Waste Packages.	1Q FY 1993
• Close Area 5 Pit 4 (classified waste).	1Q FY 1993
• Open New Area 5 LLW Pit.	1Q FY 1993
• Complete performance assessment for 40 CFR 191.	FY 1993-1994
• Close U3axbl bulk LLW disposal pit.	4Q FY 1994
• Complete Environmental Impact Statement (EIS) for Greater Confinement Disposal (GCD) methodology.	4Q FY 1995
• Complete Site-Specific EIS for Waste Operations.	FY 1995-1996
• Close U3ahat (awaiting State approval of closure plan).	
• Close Area 5 Mixed Waste Cells (as needed).	
• Complete generator audits (ongoing activity).	

Progress Chart for Nevada Field Office: Nevada Test Site *

Long-Term Objectives:
Clean up all WAGs by FY 2007
Decommission surplus facilities by FY 1998
Implement all Corrective Activities by FY 1995
Have disposal process in place for minimized waste streams by FY 1998

Five-Year Objectives:
Complete onsite assessment for 16 of 17 WAGs
Decommission all surplus facilities
Complete implementation of Waste Minimization program
Permit and construct waste treatment, storage, and disposal sites to handle waste stream



Legend

- ○ Planned Milestones
- ● Completed Milestones
- ▬ Activity

Acronyms and Initialisms

RI/FS- Remedial Investigation/Feasability Study

*For Validated Target Level

Environmental Restoration

• Negotiate Superfund Amendments and Reauthorization Act Section 120 Agreement with the State of Nevada and EPA.	FY 1992
• Complete Active Tunnel Pond/Muck Pile Assessments and Closure Plans.	FY 1992
• Complete decontamination and decommissioning (D&D) surveillance at NTS.	FY 1993
• Conduct investigations of abandoned septic tanks.	FY 1993
• Complete RCRA Closure Plan Implementation.	FY 1994
• Complete development of RCRA closure plans.	FY 1994
• Complete postevent location characterization.	FY 1996
• Complete installation of 57 Groundwater Characterization Wells.	FY 1996
• Complete CERCLA Assessments at four Waste Area Groupings (WAGs).	FY 1997

STATUS/ACCOMPLISHMENTS

Corrective Activities

- Completed fencing Areas 6, 9, and 23 Sanitary Landfills.
- Completed modifications of Areas 2, 6, 23, and 25 Sewage Lagoon Systems.
- Implemented the Pollution Prevention Awareness Plan.
- Implemented the Environmental Monitoring Plan.

Waste Management

- Disposed of 389,000 ft^3 of LLW.
- Disposed of 202,000 ft^3 of mixed waste.
- Initiated Waste Certification Program.
- Completed construction of centralized hazardous waste storage pad.
- Finalized Waste Minimization Plan.
- Shipped 499 drums (21,600 lb) of polychlorinated biphenyl (PCB)-contaminated transformer waste and 19,000 gallons of diesel and PCB-contaminated oil.
- Responded to State comments on the RCRA Part B Permit Application for a proposed mixed waste management unit at the Radioactive Waste Manangement Site in Area 5.
- Submitted closure plans for mixed waste disposal units to the State of Nevada for review.
- Completed Preliminary Performance Assessment and Source Term Inventory for GCD.
- Prepared comprehensive requirements for defense waste acceptance, certification, and transfer from offsite waste generators.
- Prepared an Environmental Monitoring Program Plan for GCD.
- Issued NV Waste Minimization and Pollution Prevention Awareness Plan.
- Initiated a procurement tracking system for hazardous materials.
- Replaced 50 percent of the hazardous materials formerly used at the NTS with nonhazardous solvents.

Environmental Restoration

- Performed CERCLA Preliminary Assessments for the inactive sites.
- Prepared Draft RCRA Closure Plans for active sites.
- Signed an Agreement-in-Principle with the States of Nevada and Mississippi.
- Prepared Draft National Environmental Policy Act (NEPA) compliance documentation for the Groundwater Characterization Program.
- Initiated RCRA assessments of active tunnel ponds and muck piles through the investigation of these sites.
- Initiated Community Relations Program; held the initial public scoping meeting for the programmatic NEPA compliance program.
- Initiated rescoring by EPA of the NTS to determine whether the facility is a candidate for the National Priorities List.

ISSUES

Corrective Activities

Risks to the potable waste supply system will be reduced and the low level of risk believed to be associated with disposal to the soil column will be evaluated and reduced through the construction of concrete pads, lined ponds, and lagoons.

Waste Management

Environmental safety and health risks will be reduced through waste minimization and through the closure and monitoring of waste disposal sites in accordance with RCRA requirements. Applicable regulations for the waste operations are RCRA, DOE Order, State of Nevada waste disposal laws and regulations, Waste Isolation Pilot Plant Waste Acceptance Criteria, and 40 CFR 191.

Environmental Restoration

The final regulatory authority is uncertain pending rescoring of the NTS WAGs through the revised EPA Hazard Ranking System. Until the decision is final, compliance activities are geared to meeting the applicable requirements of CERCLA, RCRA 3004 (u), the Safe Drinking Water Act, State environmental laws and regulations, and the underground injection control regulations. Preliminary Risk Assessments were performed for key WAGs at NTS in support of DOE's national prioritization of Environmental Restoration sites. More comprehensive assessments will be conducted as part of the CERCLA program being implemented for the facility. Risks to the general public are minimal due to the remote nature of NTS and the rigidly controlled access to the facility. There are minimal risks to the work force as a result of testing activities. Risks to CERCLA investigation workers will be reduced through worker training programs and the rigid safety protocols that have been implemented at NTS. Environmental Restoration activities primarily reduce the uncertainties pertaining to the extent of contamination and its associated health risks.

Funding: Validated Target Level ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	836	0	9,506	0	13,023	0	725	0	24,090
FY92	1,660	0	13,819	0	27,480	0	730	0	43,689
FY93	0	0	14,410	0	27,631	0	833	0	42,874
FY94	0	0	19,773	0	30,944	0	1,026	0	51,743
FY95	0	0	20,248	0	34,040	0	0	0	54,288
FY96	0	0	22,266	0	35,181	0	867	0	58,314
FY97	0	0	24,485	0	37,419	0	867	0	62,771
FY93-97	0	0	101,182	0	165,215	0	3,593	0	269,990

Funding: Preliminary Unvalidated Case ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	836	0	9,506	0	13,023	0	725	0	24,090
FY92	1,660	0	13,819	0	27,245	0	730	0	43,454
FY93	0	0	22,044	0	35,452	0	23,194	0	80,690
FY94	0	0	25,789	0	39,142	0	63,310	0	128,241
FY95	0	0	24,343	0	38,868	0	64,936	0	128,147
FY96	0	0	22,768	0	34,042	0	69,891	0	126,701
FY97	0	0	23,876	0	32,089	0	58,724	0	114,689
FY93-97	0	0	118,820	0	179,593	0	280,055	0	578,468

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.

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OAK RIDGE FIELD OFFICE
INSTALLATION SUMMARY
FORMERLY UTILIZED SITES REMEDIAL ACTION PROGRAM

FACILITY DESCRIPTION

The Formerly Utilized Sites Remedial Action Program (FUSRAP) presently includes 33 sites in 13 States. Of these, 28 are Manhattan Engineer District (MED) or Atomic Energy Commission (AEC) sites that are included in FUSRAP under authority of the Atomic Energy Act of 1954 as amended. The other five sites were added by congressional action in 1984 and 1985. Six of the sites are listed on the EPA's National Priorities List (NPL). This summary includes work performed for FUSRAP by other field offices.

The objectives of FUSRAP are to:

- Identify and assess all sites formerly used to support early MED/AEC nuclear work to determine whether further decontamination and/or control is needed.
- Decontaminate and/or apply controls to these and other program sites to permit conformance with current applicable guidelines.
- Dispose of and/or stabilize all generated residues in a radiologically and environmentally acceptable manner.

MAJOR MILESTONES

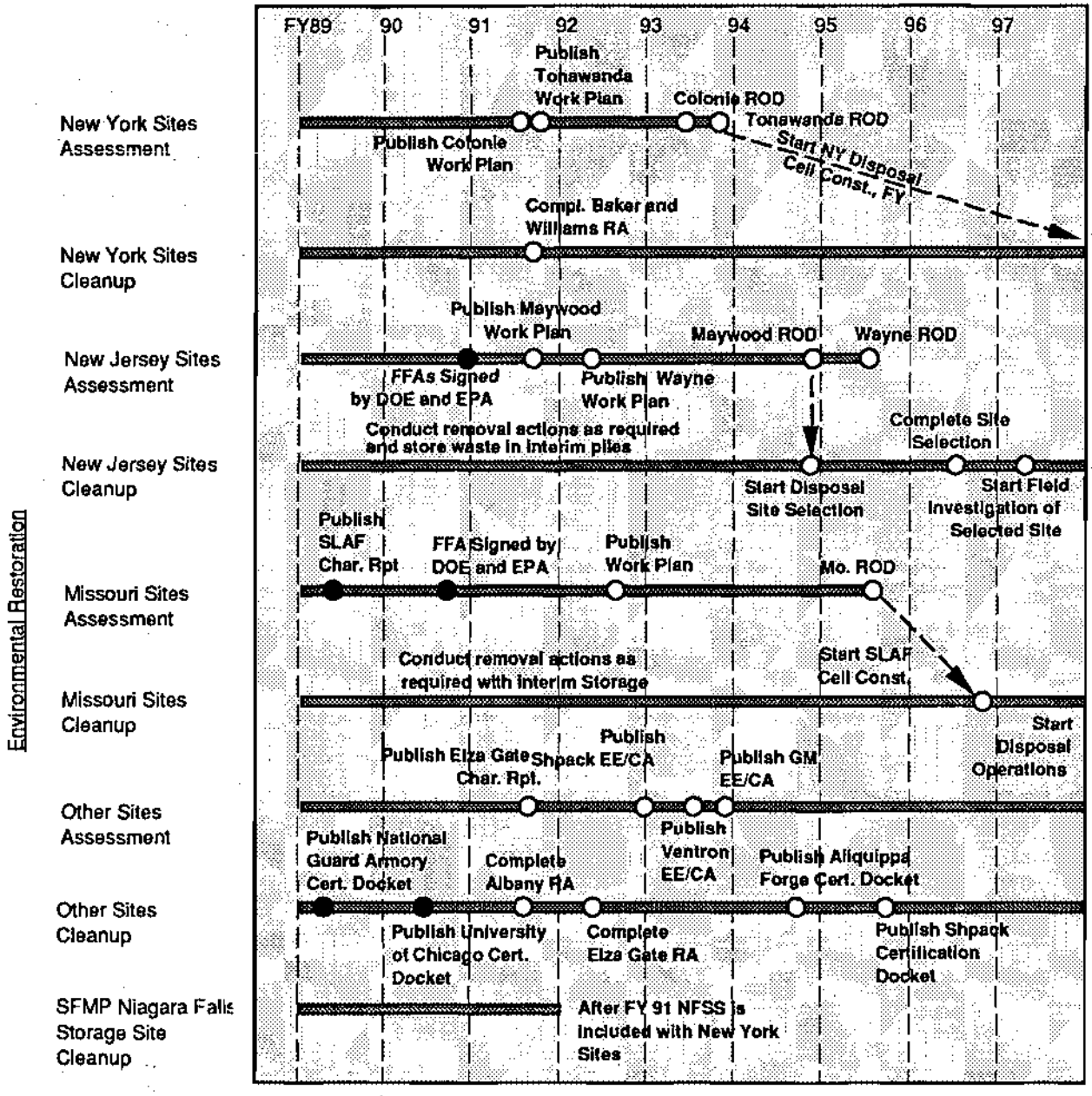
Environmental Restoration	Date
• Complete Albany Research Center (Albany, OR) remedial action.	3Q FY 1991
• Complete Elza Gate (Oak Ridge, TN) remedial action.	4Q FY 1992
• Publish Record of Decision for Colonie, NY.	3Q FY 1993
• Publish Record of Decision for Tonawanda, NY.	4Q FY 1993
• Publish Record of Decision for Maywood, NJ.	4Q FY 1994
• Publish Record of Decision for Wayne, NJ.	3Q FY 1995

There are no apparent serious alternatives to the timely remediation of properties where contamination exists. Removal of contamination from the properties is the only alternative that accomplishes the DOE goal of releasing the properties for use with no radiological restrictions. This process is mandated and enforceable under CERCLA. A possibility does exist that technologies could be developed that concentrate radionuclides or hazardous chemicals and reduce the volume of waste that must be transported and disposed.

Progress Chart for
Oak Ridge Field Office: Formerly Utilized Sites Remedial Action Program*

Long-Term Objectives:
- Clean up all New Jersey Sites by end of FY 2009
- Clean up all Missouri Sites by end of FY 2002
- Complete program by end of FY 2010

Five-Year Objectives:
- Clean up Colonie Site by end of FY 1995
- Clean up Tonawanda Sites by end of FY 1997
- Publish Maywood ROD in FY 1994
- Publish Wayne ROD in FY 1995
- Publish Missouri ROD in FY 1995



Legend
- ● Completed Milestones
- ○ Planned Milestones
- Activities
- → Information Flows

Acronyms and Initialisms

EE/CA-Engineering Evaluation/Cost Assessment
FFA-Federal Facilities Agreement
NFSS-Niagra Falls Storage Site
RA-Remedial Action
ROD-Record of Decision
SFMP-Surplus Facilities Management Program
SLAF- St. Louis Airport Facility

*For Validated Target Level

STATUS/ACCOMPLISHMENTS

Environmental Restoration

- Field characterization has been performed at Linde, Seaway, Ashland 1, and Ashland 2 in New York.
- Work plan for Colonie was issued to the public for review and comment.
- Federal Facilities Agreements were signed for Missouri Sites and for Wayne and Maywood, New Jersey.
- Work plan for Maywood was issued to the public for review and comment.
- In Missouri, characterization reports were completed for the St. Louis Downtown Site and St. Louis Airport Site vicinity properties.
- Draft work plan for Missouri was provided to EPA for review.
- Remedial action is under way at Elza Gate, Tennessee, and Albany Research Center, Oregon.

ISSUES

- Cleanup of Missouri and New Jersey vicinity properties in FY 1991-1994, with wastes going to existing interim storage piles, may be affected by community opposition.
- Lengthy RI/FS process is concern to communities and regulators.
- Disposal site: Permanent waste disposal sites must be identified to prevent program delays and cost increases.
- By FY 1995, Records of Decision will be issued for all five NPL sites for which DOE and EPA have signed Federal Facilities Agreements.

Funding: Validated Target Level* ($ in Thousands)

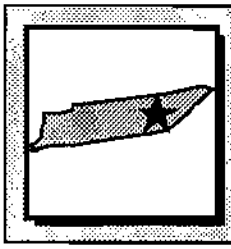
	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	0	0	0	0	15,328	0	13,872	29,200
FY92	0	0	0	0	0	17,648	0	31,352	49,000
FY93	0	0	0	0	0	6,068	0	34,832	40,900
FY94	0	0	0	0	0	4,911	0	41,589	46,500
FY95	0	0	0	0	0	8,964	0	38,793	47,757
FY96	0	0	0	0	0	4,225	0	42,532	46,757
FY97	0	0	0	0	0	4,159	0	43,609	47,768
FY93-97	0	0	0	0		61,303	0	246,579	307,882

Funding: Preliminary Unvalidated Case* ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	0	0	0	0	15,328	0	13,872	29,200
FY92	0	0	0	0	0	17,648	0	31,352	49,000
FY93	0	0	0	0	0	6,080	0	34,832	40,912
FY94	0	0	0	0	0	5,698	0	81,287	86,985
FY95	0	0	0	0	0	9,612	0	77,929	87,541
FY96	0	0	0	0	0	4,803	0	75,004	79,807
FY97	0	0	0	0	0	4,686	0	82,926	87,612
FY93-97	0	0	0	0	0	63,855	0	397,202	461,057

* Includes funding for FUSRAP activities at Chicago-Argonne National Laboratory-East and Oak Ridge.

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.



OAK RIDGE FIELD OFFICE INSTALLATION SUMMARY OAK RIDGE K-25 SITE

FACILITY DESCRIPTION

The Oak Ridge K-25 Site occupies a 1,500-acre area adjacent to the Clinch River, approximately 13 miles west of downtown Oak Ridge, Tennessee. The K-25 Site originally produced enriched uranium hexaflouride for defense purposes. Due to a declining demand for enriched uranium, the enrichment process at the K-25 Site was placed on standby in 1985 and subsequently shutdown in 1987. The K-25 Site now serves as the location of many contractor central staff functions, including operating waste treatment and storage facilities, serving as a center for applied technology, and supporting the development of the Advanced Vapor Laser Isotope Separation uranium enrichment technology.

MAJOR MILESTONES

Corrective Activities	Date
• Repair and reroute K-1203 Sewage Treatment Plant lines.	4Q FY 1993
• Repair the remainder of the collection system at the K-25 Site.	4Q FY 1994

Waste Management	
• Develop K-25 Site Waste Minimization Program.	3Q FY 1991
• Complete Project Design Criteria for low-level waste (LLW) disposal facilities.	3Q FY 1991
• Complete Solid Waste Storage Area-6 performance assessment.	4Q FY 1991
• Complete incineration of 2.1 million lb of waste at the Toxic Substances Control Act (TSCA) incinerator.	4Q FY 1991
• Document minimization goals for the Waste Management Department.	3Q FY 1992
• Develop K-25 Site Waste Certification and Verification Program.	3Q FY 1992
• Complete incineration of 2.5 million lb of waste at the TSCA incinerator.	4Q FY 1992
• Complete performance assessments for new disposal facilities.	4Q FY 1992

Environmental Restoration	
• Initiate gasket removal in motor exhaust ducts.	4Q FY 1991
• Complete sampling and analysis of lube oil systems for polychlorinated biphenyls (PCBs).	4Q FY 1991
• Initiate seven Phase 1 RCRA Facility Investigations (RFI), continue RFIs at six sites, and evaluate data from one RFI.	FY 1992
• Remove three underground petroleum storage tanks.	FY 1992
• Establish health-based cleanup levels for Oak Ridge Field Office (OR) Environmental Restoration (ER) Program.	1Q FY 1992
• Complete Groundwater Program Summary Plan for OR ER Program.	2Q FY 1992
• Revise OR Ground Water Processing Plant (GWPP) Management Plans.	1Q FY 1993
• Begin operation of the Environmental Restoration Consolidated Data Base.	4Q FY 1993
• Drain PCB transformers, properly dispose of fluid, and seal transformer carcasses.	3Q FY 1994
• Begin operation of the complete OR analytical upgrade.	4Q FY 1994
• Complete OR Environmental Restoration Waste Management Phase I-III activities.	4Q FY 1994
• Implement Environmental Restoration Information System (ERIS).	4Q FY 1994

Progress Chart for Oak Ridge Field Office: Oak Ridge K-25 Site*

Long-Term Objectives:

Complete RIs and clean up all the SWMUs by the year 2019

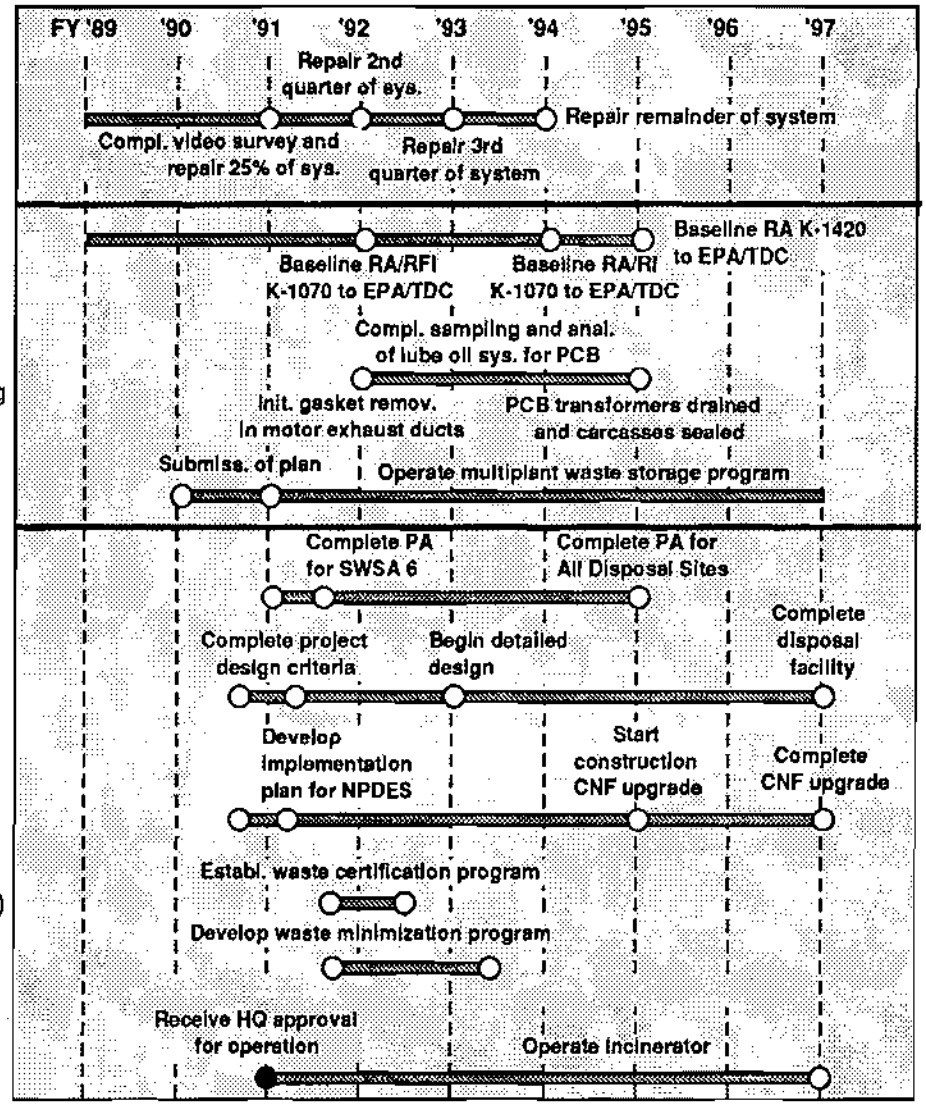
Complete the Sludge Management Project to ensure maximum protection of health and environment and to meet all regulatory requirements

Five-Year Objectives:

Complete RIs and initiate cleanup activities at nine SWMUs

Initiate RIs at all SWMUs on the K-25 Site

Complete Sludge Management Project to ensure maximum protection of health and environment and to meet all regulatory requirements



Legend

- ○ Planned Milestones
- ● Completed Milestones
- ▬ Activities

Acronyms and Initialisms

CNF-	Central Neutralization Facility
HQ-	Headquarters
NPDES-	National Pollutant Discharge Elimination System
PA-	Preliminary Assessment
RA/RI-	Remedial Action/ Remedial Investigation
RFI-	RCRA Facility Investigation
SWMU-	Solid Waste Mgmt. Unit
SWSA-	Solid Waste Storage Area
TDC-	Tennessee Department of Conservation

* Validated Target Level

STATUS/ACCOMPLISHMENTS

Corrective Activities

- The first of two gas/oil boilers has been installed to replace existing coal-fired boilers at the K-25 Site Steam Plant. The gas/oil boilers are required to meet capacity standards.
- A portion of the sewage collection system at the K-25 Site's K-1203 Sewage Treatment Plant will be repaired and rerouted each year through FY 1994. This will eliminate infiltration of groundwater and rainwater, which periodically results in noncompliance with the NPDES permit.

Waste Management

- Direction of the Waste Management and Corrective Activities portions of the DOE HQ EM Program belongs to DOE-OR and the new Central Waste Management Division (established in 1990 and located at the K-25 Site). While the division serves all five plants managed by Martin Marietta Energy Systems, Inc., it also has several related program planning and support functions, including development and operation of future centralized waste treatment, storage, and disposal facilities and management of the DOE Scrap Metal Program.
- The K-25 Site is developing an implementation plan for operation of the Central Neutralization Facility (CNF) in compliance with NPDES permit limits. The CNF treats wastewater so that it will comply with NPDES discharge limits; the K-1203 Sewage Treatment Plant; and the K-1232 Treatment Facility, a RCRA wastewater treatment unit.
- The K-25 Waste Storage program has 43 storage units of waste now being stored.
- The TSCA Incinerator thermally destroys mixed hazardous wastes from DOE OR facilities. This incinerator is a critical treatment unit for bringing the DOE sites into compliance with RCRA/TSCA storage and treatment requirements. TSCA was authorized for full operation in late March 1991.
- The Oak Ridge Filter Test Facility is operated within the K-25 Site and provides high-efficiency particulate air filter and respirator canister testing capabilities for DOE's eastern facilities.
- The Conceptual Design Report for the LLW Disposal Facilities was completed in February 1990, and the design criteria were completed in April 1991.
- The CNF Optimization Plan was completed in March 1991.

Environmental Restoration

- Operation of K-25 Site for the past 45 years created facilities and sites containing hazardous materials and wastes. The sites included burial grounds, process facilities, storage facilities, underground tanks, surface impoundments, treatment facilities, process lines, and accumulation areas exhibiting the potential for releasing contaminants into the environment. Uranium-contaminated liquid and sludge, PCB-contaminated solid waste, and RCRA hazardous wastes will be incinerated onsite.
- One hundred and forty Solid Waste Management Units (SWMUs) have been identified at the K-25 Site. Offsite surface waters have been contaminated with radionuclides, metals, and organic compounds.
- The gaseous diffusion facilities comprise approximately 140 acres. These facilities contain extensive amounts of asbestos insulation, RCRA oils and chemicals, PCBs, special nuclear materials, and residual radionuclides. The gas centrifuge buildings, containing 325,000 ft^2 of floor space, house contaminated and classified centrifuge equipment and process materials.
- Federal Facilities Agreement (FFA) milestone negotiations with EPA and the Tennessee Department of Health and Environment (TDHE) will occur.
- The Hazardous Waste Remedial Actions Program provides support to OR HQ, including technical support and technical information support for EM-40 activities.
- RCRA Facility Assessments have been completed on all currently identified SWMUs.
- RCRA Remedial Investigations have been initiated on four SWMUs.
- Design of a bioreclamation system for the cleanup of diesel fuel products in groundwater and soils has been completed and the Environmental Assessment is being prepared.

- Sludge Waste Management activities for the management of wastes from the K-1407-B and K-1407-C ponds were initiated and are currently continuing.
- An Administrative Record was established and contractor support was hired for ER Program activities.

ISSUES

Environmental, Health, and Safety Risk

Noncompliance with environmental regulations implies the potential for environmental consequences.

Personnel exposure to friable asbestos-containing materials, PCBs, and RCRA-regulated oils and chemicals is a concern in and around the gaseous diffusion facilities.

Possible contamination of the Clinch River could affect the municipal drinking water supply, fishing, and recreation.

Applicable Regulations/Agreements/Orders

Draft FFA (EPA Region IV, TDC, and DOE)
Clean Water Act/Tennessee Water Quality Regulations
NPDES
RCRA/Hazardous and Solid Waste Amendments/Tennessee Hazardous Waste Regulations
CERCLA
NEPA
TSCA
DOE/TN Agreement-in-Principle
NCP TDC, Subtitle 1
DOE Orders

Funding: Validated Target Level ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	1,232	0	19,256	2,080	68,838	6,435	27,905	3,598	129,344
FY92	12,608	0	53,222	2,059	81,189	45,206	10,316	7,611	212,211
FY93	554	0	72,371	0	117,110	49,011	19,028	29,364	287,438
FY94	583	0	75,214	0	142,288	50,522	31,747	32,053	332,407
FY95	0	0	78,678	0	121,099	54,922	51,396	45,440	351,535
FY96	0	0	83,788	0	122,937	45,970	42,661	36,924	332,280
FY97	0	0	92,052	0	128,087	39,972	62,261	57,948	380,320
FY93-97	1,137	0	402,103	0	631,521	240,397	207,093	201,729	1,683,980

Funding: Preliminary Unvalidated Case ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	1,232	0	19,256	2,080	68,838	6,435	27,905	3,598	129,344
FY92	12,608	0	53,222	2,059	81,189	45,206	10,316	7,611	212,211
FY93	554	0	99,370	0	248,795	62,173	32,448	38,854	482,194
FY94	583	0	161,040	0	178,240	60,325	30,497	35,773	466,458
FY95	0	0	225,555	0	151,983	64,760	48,954	48,411	539,663
FY96	0	0	223,444	0	158,082	64,957	54,496	54,548	555,527
FY97	0	0	150,017	0	149,513	55,298	62,261	64,140	481,229
FY93-97	1,137	0	859,426	0	886,613	307,513	228,656	241,726	2,525,071

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.

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OAK RIDGE FIELD OFFICE
INSTALLATION SUMMARY
OAK RIDGE NATIONAL LABORATORY

FACILITY DESCRIPTION

The Oak Ridge National Laboratory (ORNL) occupies several sites and covers approximately 2,900 acres in Melton Valley and Bethel Valley, 10 miles southwest of downtown Oak Ridge, Tennessee. ORNL's mission is to conduct applied research and engineering development in support of DOE programs in fusion, fission, conservation, fossil, and other energy technologies and to perform basic scientific research in selected areas of the physical and life sciences. Past research and development (R&D) and waste management activities at ORNL have produced a significant number of RCRA/CERCLA units contaminated with low-level radioactive and/or hazardous chemical wastes that will potentially require remediation. The Oak Ridge Reservation, which includes ORNL, was placed on the National Priorities List in 1989.

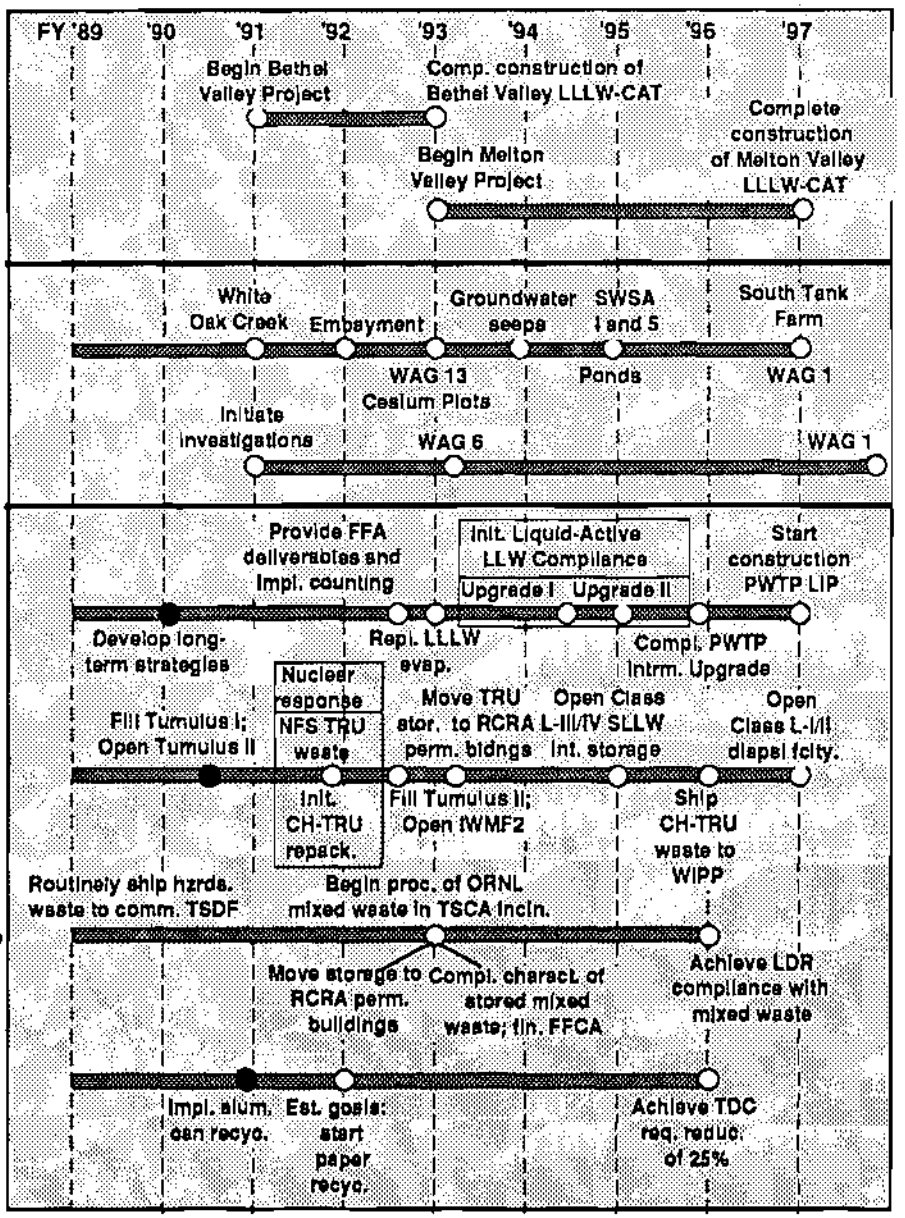
MAJOR MILESTONES

Corrective Activities	Date
• Complete construction of Liquid Low-Level Waste (LLLW) Collection and Transfer (CAT) Systems for:	
Bethel Valley	4Q FY 1993
Melton Valley	1Q FY 1998
Waste Management	
• Issue Waste Handling and Packaging Plant Conceptual Design Report.	2Q FY 1992
• Issue Annual ORNL Waste Reduction Report.	2Q FY 1992
• Issue Final Report on Characterization of Stored Mixed Waste.	3Q FY 1992
• Begin Construction of a Mixed Waste Storage Upgrade in Building 7507.	3Q FY 1992
• Complete Receipt of Nuclear Fuel Services (NFS) Waste and Scrap.	1Q FY 1993
• Complete Detailed Design for the Waste Characterization and Certification Facilities.	1Q FY 1996
• Complete Design of Bethel Valley Federal Facilities Agreement (FFA) Upgrade I.	4Q FY 1996
• Complete Design of Bethel Valley FFA Upgrade II.	4Q FY 1997
• Complete Construction of the Process Waste Treatment Plant Line Item Project.	1Q FY 1998
Environmental Restoration	
• Submit Waste Area Grouping (WAG) 6 RCRA Facility Investigation (RFI) Report to EPA/Tennessee Department of Conservation (TDC).	4Q FY 1991
• Complete White Oak Creek Embayment Interim Corrective Measures (ICMs) Removal Actions.	1Q FY 1992
• Complete 3001 Canal Interim Closure.	1Q FY 1992
• Complete closure of the 7860-A.	1Q FY 1992
• Submit WAG 6 Corrective Measures Study (CMSs)/Environmental Assessment (EA) to EPA/TDC.	1Q FY 1993
• Complete WAG 13 ICMs.	4Q FY 1993
• Submit WAG 6 Remedial Action Plan/Record of Decision (RAP/ROD) to EPA/TDC.	1Q FY 1994
• Complete WAG 6 Closure Design.	3Q FY 1994
• Prepare/submit WAG 1 Feasibility Study (FS)/EA to EPA/TDC.	4Q FY 1996
• Complete WAG 6 closure.	3Q FY 1997
• Submit WAG 1 RAP/ROD to EPA/TDC.	4Q FY 1997
• Complete ICMs (South Tank Farm).	4Q FY 1997
• Complete ICMs (North Tank Farm).	4Q FY 1998
• Complete ICMs (Old Hydrofracture Site Tanks).	4Q FY 1998

Progress Chart for Oak Ridge Field Office: Oak Ridge National Laboratory*

Long-Term Objectives:
Complete RI/FS/NEPA/RAP/ROD process on all WAGs; remediation of inactive LLLW tank contents; remediate majority of WAGs

Five-Year Objectives:
Close WAG 6; complete seven RIs; continue S&M; complete ICMs necessary to protect human health and the environment



Legend

- ○ Planned Milestones
- ● Completed Milestones
- → Information Flows
- ▬ Activities

Acronyms and Initialisms

CAT-	Collection and Transfer
CH-TRU-	Contact Handled Transuranic
FFCA-	Federal Facility Compliance Agreement
IWMF-	Interim Waste Management Facility
LDR-	Land Disposal Restriction
LIP-	Line Item Project
NFS-	Nuclear Fuel Services
PWTP-	Production Waste Treatment Plant
RAP-	Remedial Action Plan
ROD-	Record of Decision
S&M-	Surveillance and Maintenance
SWSA-	Solid Waste Storage Area
TSCA-	Toxic Substances Control Act
TSDF-	Treatment, Storage, and Disposal Facility
WAG-	Waste Area Grouping
WHPP-	Waste Handling and Packaging Plant
WIPP-	Waste Isolation Pilot Plant

* For Validated Target Level

STATUS/ACCOMPLISHMENTS

Corrective Activities

- Complete detailed design for the Bethel Valley LLLW CAT Systems upgrade project was completed.
- All systems requirements have been developed, Conceptual Design Report completed, and the Line Item Projects (LIP) validated for the Melton Valley LLLW CAT upgrade project.
- Attained Federal Facility Compliance Agreement (FFCA) compliance levels for nonradiological wastewater treatment plant.
- The LLLW CAT Systems are being upgraded to meet FFA requirements.

Waste Management

- Routine waste collection, transfer, storage, and treatment are provided.
- Interim waste operations activities include the development of waste management strategies and demonstration of improved operation of waste systems.
- Shipment of ORNL waste to TSCA incinerator will begin.
- Additional management capability for ORNL Contact Handled (CH) and Remote Handled (RH) transuranic (TRU) waste is being provided.
- Support activities include critical data base management, waste minimization, and WHPP management.
- Activities continue to demonstrate greater alternative confinement disposal technologies such as aboveground tumulus and belowgrade silos.
- Operation of the new Nonradiological Wastewater Treatment Plant began in 1990, and the FFCA goal was met.
- An effective LLLW minimization effort that reduced generation by 60 percent has been maintained for the past 5 years.

Environmental Restoration

- Approximately 300 RCRA/CERCLA units, divided into 20 WAGs, have been identified at ORNL. Two hundred and twenty-two of these units included within 12 of the WAGs will potentially require remediation. Wastes that have been generated are primarily liquid and solid, low-level, and TRU radioactive waste. Nonradioactive wastes include organic solvents, corrosive waste, polychlorinated biphenyls (PCBs), and heavy metals.
- Decontamination and decommissioning activities encompass a variety of facilities ranging from abandoned waste storage tanks to large experimental reactors.
- Remedial Investigation (RI) field activities have been completed in WAG 6 and have been initiated for WAGs 1 and 2.
- WAG 6 Feasibility Study/NEPA documentation is in progress.
- ICMs have been completed in WAG 6 and are progressing with the White Oak Creek Embayment and the 3001 Storage Canal.
- Thirteen RI plans have been submitted to EPA Region IV and TDC for review, comment, and approval.

ISSUES

Environmental, Health, and Safety Risk

No immediate or short-term offsite health risks have been identified based on available information; however, surface and groundwater contamination and offsite radionuclide contamination exist. Radionuclides migrate from older solid LLW and TRU waste storage/disposal areas.

Risk of any environmental insult or adverse impact to public health is low-to-moderate for noncompliance situations identified by State compliance inspections and internal DOE appraisals.

Existing 30-year-old LLLW CAT Systems are singly contained, subject to leakage, and not designed for integrity testing as specified by current regulatory requirements.

Applicable Regulations

Draft FFA (EPA Region IV, TDC, and DOE)
Clean Air Act
National Emission Standards for Hazardous Air Pollutants
Clean Water Act/Tennessee Water Quality Regulations/National Pollutant Discharge Elimination System Permit
Safe Drinking Water Act
RCRA/Hazardous and Solid Waste Amendments/Tennessee Hazardous Waste Regulations
CERCLA
Toxic Substances Control Act
TDC, Subtitle I
NEPA
DOE Orders
Tiger Team Findings
DOE/TN Agreement-In-Principle

Funding: Validated Target Level ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	8,433	16,537	11,727	31,028	2,116	18,799	175	88,815
FY92	0	7,279	34,330	19,705	35,928	13,837	34,678	2,917	148,674
FY93	0	16,400	36,640	22,107	18,061	13,833	6,099	38,607	151,747
FY94	0	12,000	44,129	17,989	24,737	11,022	4,320	44,817	159,014
FY95	0	10,482	49,372	17,910	31,163	11,939	4,753	41,476	167,095
FY96	0	0	60,614	21,359	27,493	5,678	33,934	16,856	165,934
FY97	0	0	49,898	40,273	24,806	5,812	49,204	3,817	173,810
FY93-97	0	38,882	240,653	119,638	126,260	48,284	98,310	145,573	817,600

Funding: Preliminary Unvalidated Case ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	8,433	16,537	11,727	31,028	2,116	18,799	175	88,815
FY92	0	7,279	34,330	19,705	35,928	13,837	34,678	2,917	148,674
FY93	0	16,400	61,904	42,392	26,310	5,588	17,057	52,854	222,505
FY94	0	12,000	92,585	45,250	35,791	6,107	105,083	6,144	302,960
FY95	0	10,482	140,300	60,250	32,731	8,069	103,244	4,038	359,114
FY96	0	0	168,050	56,500	33,065	5,599	108,842	3,963	376,019
FY97	0	0	139,900	47,300	28,904	5,700	115,447	3,475	340,726
FY93-97	0	38,882	602,739	251,692	156,801	31,063	449,673	70,474	1,601,324

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.

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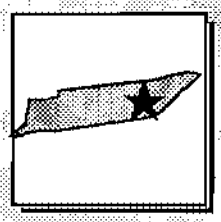


OAK RIDGE FIELD OFFICE INSTALLATION SUMMARY OAK RIDGE Y-12 PLANT

FACILITY DESCRIPTION

The Oak Ridge Y-12 Plant occupies an 811-acre site in the Bear Creek Valley approximately 2 miles from downtown Oak Ridge, Tennessee. The site is drained by Bear Creek and East Fork Poplar Creek. The Y-12 Plant, built in 1943 as part of the Manhattan Project, was established to separate uranium isotopes by the electromagnetic process. When the process was discontinued after World War II, the Y-12 Plant's role changed to manufacturing and developmental engineering. The Y-12 Plant contains many facilities that have been used for treating, storing, or disposing of hazardous and radioactive waste, and hazardous substances. Examples of this include landfills, incinerators, drum storage areas, aboveground storage tanks, underground storage tanks, surface impoundments, and treatment facilities. The Oak Ridge Reservation, which includes the Y-12 Plant, was placed on the National Priorities List in 1989.

MAJOR MILESTONES

Corrective Activities	Date
• Complete construction of Steam Plant Ash Disposal and Leachate Treatment Facility.	3Q FY 1993
Waste Management	
• Cease disposal operations for solid low-level waste (LLW) at the Bear Creek Burial Ground (BCBG).	3Q FY 1991
• Provide regulatory-compliant treatment of 1.6 million gallons of waste.	4Q FY 1991
Environmental Restoration	
• Complete Alternate Concentration Limits (ACL) demonstration for S-3 pond, BCBG/Oil Land Farm, and New Hope Pond (NHP).	4Q FY 1992
• Obtain Record of Decision (ROD) for East Fork Poplar Creek.	4Q FY 1993
• Obtain complete RCRA closures.	4Q FY 1993
• Rehabilitate sanitary sewer system.	4Q FY 1993
• Procure system and install ozonation units.	4Q FY 1995
• Construct additional treatment units.	4Q FY 1995
• Complete remedial design of groundwater treatment facilities.	4Q FY 1995
• Obtain ROD for Group I Sites.	4Q FY 1996
• Obtain ROD for Group II Sites.	4Q FY 1997

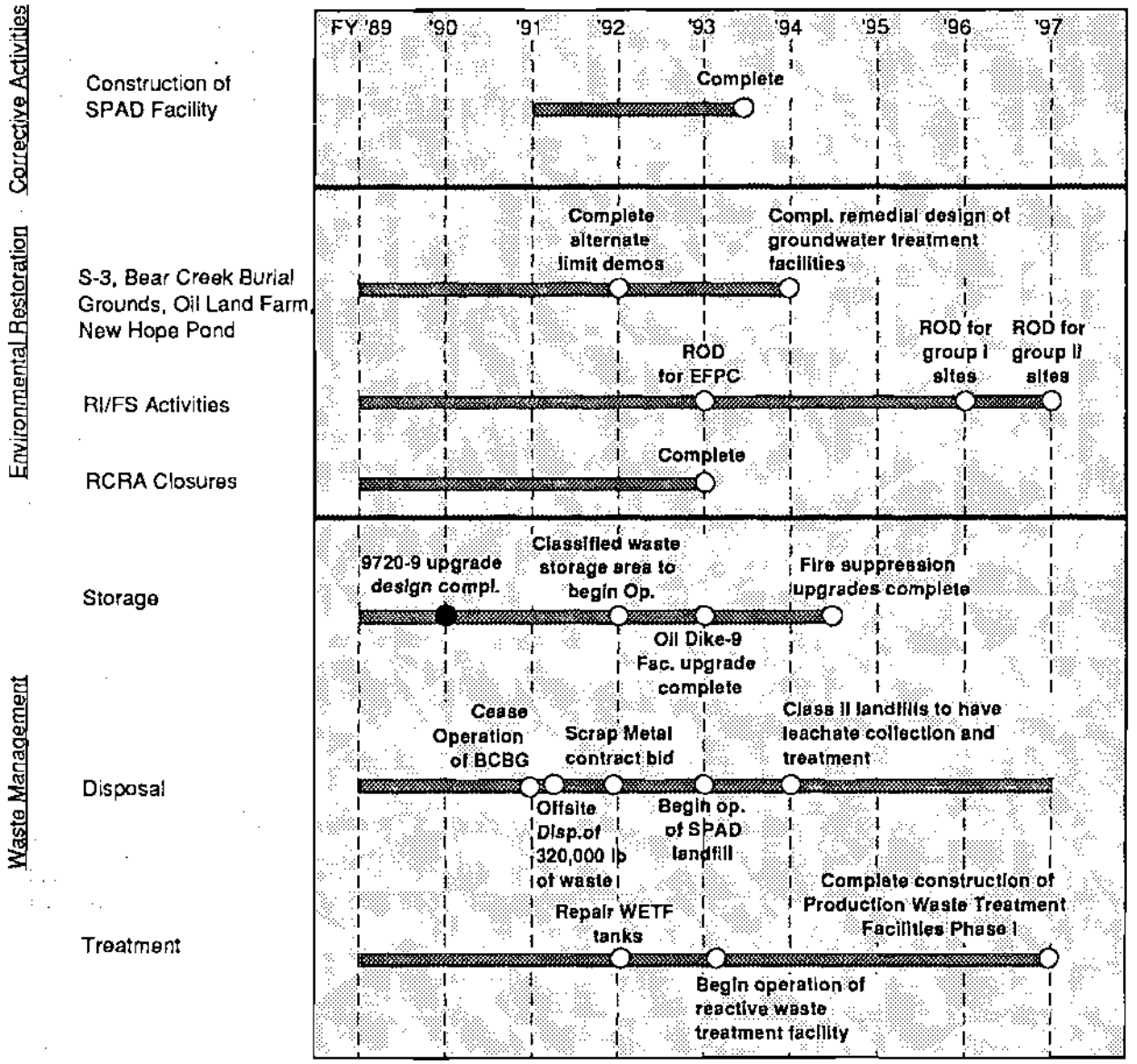
Progress Chart for
Oak Ridge Field Office: Oak Ridge Y-12 Plant*

Long-Term Objectives:

Complete EFPC cleanup by 2015
Complete remediation of major contaminated areas at Y-12 Plant by 2015

Five-Year Objectives:

Complete RCRA closures
Provide new storage facilities for flammable mixed waste, nonflammable mixed waste, and classified waste
Complete remedial design of groundwater treatment facilities



Legend

- ○ Planned Milestones
- ● Completed Milestones
- ▬ Activities

Acronyms and Initialisms

BCBG- *Bear Creek Burial Ground*
EFPC- East Fork Poplar Creek
RI/FS- Remedial Investigation/Feasibility Study
ROD- Record of Decision
SPAD- Steam Plant Ash Disposal
WETF- West End Treatment Facility

*** For Validated Target Level**

STATUS/ACCOMPLISHMENTS

Corrective Activities

- The conceptual design and design criteria, risk and safety assessments, and quality assurance and project management plans for the Steam Plant Ash Disposal Facility have been prepared and approved. National Environmental Policy Act (NEPA) documentation is nearly complete. Construction of the dry fly ash handling and collection system was completed.
- Feasibility studies and detailed designs are being initiated for additional modifications and improvements to control wastewater, cooling tower discharges, and plant drain discharges into East Fork Poplar Creek and to reduce biological toxicity in effluents.
- Flow studies have been conducted to determine major areas of infiltration of the sewage collection system.

Waste Management

- Solid LLW is being containerized and stored so that the BCBG can be phased out by June 30, 1991. In addition, a contract is being developed to provide for segregation and containerization of radioactive contaminated scrap metal.
- Solid waste disposal activities are operated in compliance with applicable environmental regulations and DOE Orders designed to protect human health and the environment. Activities include operating and maintaining active disposal sites.
- Process waste assessments are being performed on all Y-12 Plant waste streams to identify opportunities for waste minimization.
- Ongoing activities to deal with currently generated waste are accomplished in accordance with all State and Federal regulations and DOE Orders.
- Projects are under way to ensure continuous Y-12 Plant production capability, improve efficiency, respond to changing environmental requirements, and develop mixed waste treatment methods.

Environmental Restoration

- Site contamination includes hazardous materials, low-level radioactive material (primarily uranium), and mixed wastes resulting mainly from the weapons production processes. Some of the wastes are highly reactive (pyrophoric and pyrotechnic). The contaminated sites in need of environmental restoration include past-practice waste disposal sites, waste storage tanks, spill sites, and contaminated inactive facilities. Additionally, significant amounts of mercury are present onsite and offsite in the East Fork Poplar Creek floodplain soils and sediments.
- A total of 29 RCRA Facility Investigation (RFI) Plans were submitted to regulators; fieldwork has been initiated on 12 of the sites.
- Two Remedial Investigations/RFI Reports have been submitted to regulators.
- A total of 12 of 16 RCRA closures were completed.

ISSUES

Environmental, Health, and Safety Risk

Deferral of daily operational activities will result in the potential for uncontrolled releases of hazardous and radioactive waste into the environment.

Risk of any environmental insult or adverse impact to public health is low-to-moderate for the noncompliance situations identified by State compliance inspections and internal DOE appraisals.

Potential health risks exist from offsite migration of contamination, particularly mercury contamination.

Environmental, Health, and Safety Risk (continued)

A study by the Centers for Disease Control and the Tennessee Department of Conservation (TDC) concluded that Oak Ridge residents are not likely to be at increased risk from significantly high mercury levels in the local environment. Mercury concentrations found in urine and hair samples from local residents were within background ranges.

To ensure employees' health and safety, some inactive and active work areas are being decontaminated.

Applicable Regulations/Agreements/Orders

Draft Federal Facilities Agreement (EPA Region IV, TDC, and DOE)
Clean Water Act/Tennessee Water Quality Regulations
NPDES Permits
Clean Air Act
National Emission Standards for Hazardous Air Pollutants
RCRA/Hazardous and Solid Waste Amendments (HSWA)/Tennessee Hazardous Waste Regulations
NEPA
CERCLA
Toxic Substances Control Act
Tennessee Solid Waste Regulations
TDC, Subtitle 1
DOE Orders
DOE/TN Agreement-in-Principle

Funding: Validated Target Level ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	6,000	0	42,710	0	7,443	0	10,078	0	66,231
FY92	15,777	0	71,932	0	11,411	0	15,603	0	114,723
FY93	1,030	0	64,920	0	6,992	0	25,608	0	98,550
FY94	600	0	74,116	0	7,687	0	28,419	0	110,822
FY95	300	0	76,933	0	7,633	0	29,181	0	114,047
FY96	0	0	81,973	0	7,540	0	25,958	0	115,471
FY97	0	0	90,171	0	7,593	0	26,579	0	124,343
FY93-97	1,930	0	388,113	0	37,445	0	135,745	0	563,233

Funding: Preliminary Unvalidated Case ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	6,000	0	42,710	0	7,443	0	10,078	0	66,231
FY92	15,777	0	71,932	0	11,411	0	15,603	0	114,723
FY93	1,030	0	70,775	0	11,018	0	47,800	0	130,623
FY94	600	0	80,845	0	14,012	0	145,100	0	240,557
FY95	300	0	130,345	0	17,330	0	151,130	0	299,105
FY96	0	0	169,415	0	18,950	0	80,365	0	268,730
FY97	0	0	179,715	0	13,540	0	62,222	0	255,477
FY93-97	1,930	0	631,095	0	74,850	0	486,617	0	1,194,492

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.

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OAK RIDGE FIELD OFFICE
INSTALLATION SUMMARY
PADUCAH GASEOUS DIFFUSION PLANT

FACILITY DESCRIPTION

The principal onsite process at Paducah Gaseous Diffusion Plant (PGDP), located 15 miles west of Paducah, Kentucky, is the separation of uranium isotopes through gaseous diffusion. The process produces enriched uranium, which is used for nuclear fuel in commercial power plants and for military purposes. The site covers 750 acres (including 74 acres of process buildings). The site is included in a 3,422-acre tract of DOE-owned property.

MAJOR MILESTONES

Corrective Activities	Date
• Complete design of troughing option for polychlorinated biphenyl (PCB) control improvements.	FY 1992
• Complete conceptual design report (CDR) for Process Water and Runoff Collection Systems.	FY 1992
• Complete construction of PCB control improvements.	FY 1994

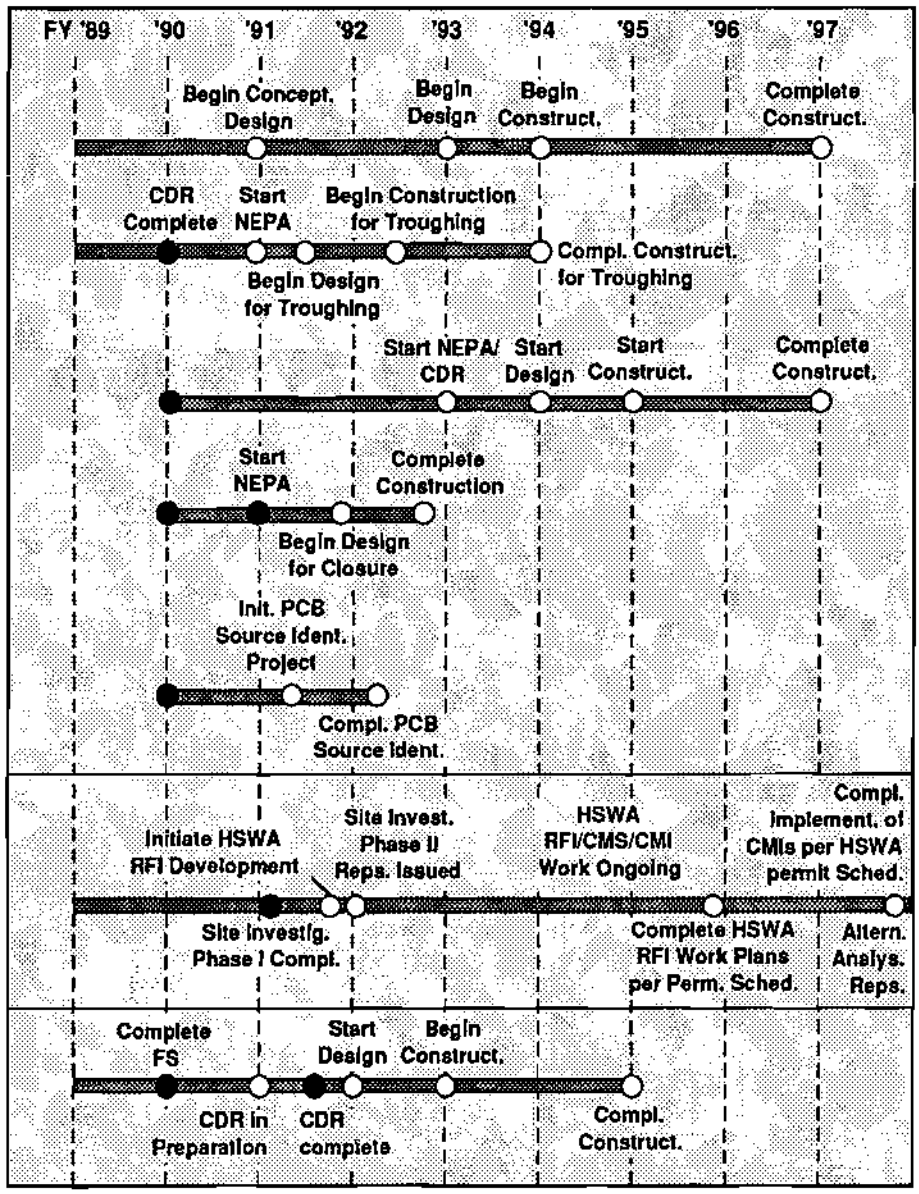
Waste Management	
• Complete construction of storage facility upgrade.	FY 1992
• Complete design of New Storage Facility.	FY 1993
• Complete construction of New Storage Facility.	FY 1994

Environmental Restoration	
• Issue Phase II Site Investigation and Alternatives Evaluation Report.	1Q FY 1992
• Initiate and issue alternative analyses reports.	2Q FY 1994
• Complete Hazardous and Solid Waste Amendments (HSWA) work plans per permit schedule.	4Q FY 1995
• Complete RCRA Facility Investigations (RFIs) per HSWA permit schedule.	4Q FY 1997

Progress Chart for
Oak Ridge Field Office: Paducah Gaseous Diffusion Plant *

Long-Term Objective:
Complete all the corrective measures required at PGDP

Five-Year Objectives:
Complete all the investigations and alternatives analysis at PGDP



Legend

- ○ Planned Milestones
- ● Completed Milestones
- ▬ Activities

Acronyms and Initialisms

CDR-Conceptual Design Report
CMI- Corrective Measures Implementation
CMS - Corrective Measures Study
FS-Feasibility Study
HSWA - Hazardous and Solid Waste Amendments
KPDES-Kentucky Pollutant Discharge Elimination System
PCB-Polychlorinated Biphenyl
PGDP-Paducah Gaseous Diffusion Plant
RFI-RCRA Facility Investigation

* For Validated Target Level

STATUS/ACCOMPLISHMENTS

Corrective Activities

- Begin design for project that provides process water and runoff water collection systems intercepting waste streams before entering storm drains or pen ditches.
- Install oil collection troughs to collect PCB-contaminated oil drips to meet PCB usage regulations.

Waste Management

- Upgrading, replacing, or adding dikes around tank and container storage facilities is required to provide containment in the event of a spill. Construction is anticipated to begin in FY 1991.
- An alternate facility and/or system is planned to significantly reduce or eliminate the use of chlorinated solvents. While PGDP presently complies with waste regulations for chlorinated solvents, this waste minimization project is planned because of the desirability of eliminating the use of materials that may have adverse environmental and health impacts and in anticipation of increasingly stringent regulation of these materials.
- Wastewater treatment systems at PGDP are proposed for C-720 and C-400 to provide improved treatment of waste streams that could contribute to noncompliance if current limits regulating the discharge of radionuclides are changed.
- Continuing waste management operations at PGDP include waste sampling and characterization, packaging, transportation, storage, and onsite and offsite disposal. These activities support plant operations and environmental restoration program activities.
- An upgrading of an existing storage area is required for high-assay waste spacing, criticality alarms installation, and physical separation of the storage area from other nearby facilities. Additional RCRA and Toxic Substances Control Act (TSCA) waste storage facilities are required for wastes generated by plant operations.
- A new solid waste landfill (an FY 1993 line item project) will replace the currently operating sanitary landfill and provide for construction of a new, contained landfill. New regulations enacted in January 1990 will require the existing landfill to close in 1992 and a new landfill to have double liners and a leachate collection system.
- PGDP programs produced radioactively contaminated scrap metal during the 1970s and early 1980s. This metal has been through a decontamination process to remove leachable contamination and placed in several storage yards onsite. The yards were initially filled according to metal type that was segregated into aluminum, nickel-plated steel, and miscellaneous metals. Although large quantities of nickel were generated, the nickel and certain forms of aluminum were melted into ingots for classification purposes. Runoff from the scrap piles is contributing to Clean Water Act (CWA) violations. An Oak Ridge Field Office (OR) plan to recover this scrap metal has been formulated.
- A mixed waste facility for storing PGDP-generated hazardous/radioactive and/or PCB/radioactive wastes is planned in FY 1993. These wastes are generated as a result of normal operations, site investigation, and cleanup activities and must be stored in accordance with RCRA and TSCA regulations.
- New regulations enacted in 1990 will require closing the current landfill cell in 1992 and replacing it with a new cell that is equipped with a leachate collection system and double liners. Constructing a new cell will be necessary.
- A pollution and waste data management system and an effluent monitoring system to support an aggressive environmental protection and waste minimization program are planned for FY 1992. The pollution and waste data system provides comprehensive data tracking and information collection. The effluent monitoring system will support waste minimization and pollution control activities by adding or upgrading monitoring of releases to verify compliance with regulations.
- Projects to increase efficiency, minimize waste generation, and allow PGDP to remain in compliance with TSCA regulations include a PCB decontamination facility, a sludge volume reducer for reducing LLW generated by the uranium solution treatment process, a compactor for compacting LLW, and a paper shredder for the paper recycling project; these projects will reduce the amount of waste being landfilled at PGDP by up to 40 percent.

Environmental Restoration

- An estimated 144 SWMUs have been identified as needing site characterization.
- Groundwater contamination exists both onsite and offsite.
- Sediment and soil contamination exists both onsite and offsite.
- Major known contaminants are technetium-99, trichloroethylene in the groundwater, and PCBs.
- Phase I Site Investigation has been completed.
- Phase II Site Investigation Work Plan has been submitted and approved by EPA. Field investigation activities have been initiated.
- Engineering design has been completed, and a contract has been awarded for the removal of two leaking Underground Storage Tanks scheduled for removal in April 1991.
- An investigation was initiated to determine which contaminants (including PCBs) are present in Kentucky Pollutant Discharge Elimination System (KPDES) outfalls.

ISSUES

Environmental, Health, and Safety Risk

Contaminated residential wells have been placed on public water supplies. Surrounding residential wells are being monitored.

Potential health risks exist if the contamination plume is not characterized and remediated.

Only minimal near-term risks are identified in connection with Corrective Activities.

Applicable Regulations/Agreements/Orders

DOE/EPA Administrative Consent Order.
HSWA permit
CWA/KPDES Regulations
RCRA
CERCLA
TSCA
Applicable State regulations
Kentucky Solid Waste Regulations
Nuclear Regulatory Commission Regulations
DOE Orders

Funding: Validated Target Level ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	2,750	0	5,679	0	27,804	0	825	37,058
FY92	0	12,659	0	17,643	6,270	6,379	7,730	8,245	58,926
FY93	0	16,225	0	40,876	14,760	12,365	10,960	10,960	106,146
FY94	0	8,835	0	57,114	19,476	15,838	4,000	4,000	109,263
FY95	0	7,300	0	47,964	17,842	12,958	2,607	2,607	91,278
FY96	0	42,200	0	43,864	14,908	10,147	5,995	5,995	123,109
FY97	0	6,700	0	31,451	13,776	9,023	7,534	7,534	76,018
FY93-97	0	81,260	0	221,269	80,762	60,331	31,096	31,096	505,814

Funding: Preliminary Unvalidated Case ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	2,750	0	5,679	0	27,804	0	825	37,058
FY92	0	12,659	0	17,643	6,270	6,379	7,730	8,245	58,926
FY93	0	16,225	0	38,422	16,490	13,775	12,370	12,370	109,652
FY94	0	8,835	0	63,152	19,575	15,837	2,820	4,000	114,219
FY95	0	7,300	0	47,964	14,551	10,151	2,780	2,780	85,526
FY96	0	42,200	0	43,864	15,183	10,477	5,995	5,995	123,714
FY97	0	6,700	0	31,451	11,837	7,157	5,847	5,847	68,839
FY93-97	0	81,260	0	224,853	77,636	57,397	29,812	30,992	501,950

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.

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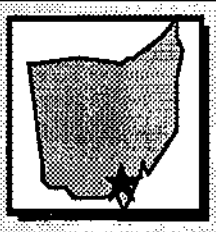


OAK RIDGE FIELD OFFICE
INSTALLATION SUMMARY
PORTSMOUTH GASEOUS DIFFUSION PLANT

FACILITY DESCRIPTION

The principal onsite process at the Portsmouth Gaseous Diffusion Plant (PORTS) in Ohio is the separation of uranium isotopes through gaseous diffusion. This process produces enriched uranium, which is used for nuclear fuel in commercial power plants and for military purposes. The site covers 3,700 acres, including 93 acres for the process building and is approximately 20 miles north of Portsmouth, Ohio.

MAJOR MILESTONES

Corrective Activities	Date
• Complete design of polychlorinated biphenyl (PCB) Control Improvements (Gaskets).	FY 1991
• Initiate testing and implementation of PCB decontamination of the lubricating oil systems.	FY 1991
• Begin construction of PCB Control Improvements (Gaskets).	FY 1992

Waste Management	
• Complete construction of Mixed Waste Storage Facility (Pre-engineered warehouse).	4Q FY 1991
• Authorize Project for a 10-year Mixed Waste Storage Facility.	4Q FY 1991
• Complete Feasibility Study Report for Radioactive Scrap Metal.	2Q FY 1992
• Complete Feasibility Study Report for Low-Level Waste Disposal.	2Q FY 1992
• Complete Title II Design of Mixed Waste Storage Facility.	4Q FY 1992
• Decision on the installation of the encapsulator.	1Q FY 1993
• Begin engineering for radioactive scrap metal storage pad.	1Q FY 1993
• Begin construction for radioactive scrap metal storage pad.	1Q FY 1996

Environmental Restoration	
• Complete Well 6B Interim Remedial Measure.	FY 1991
• Complete RCRA Closure.	FY 1992
• Complete RCRA Facility Investigation (RFI) for Quadrants I and II.	FY 1992
• Complete X-701B Interim Remedial Measure.	FY 1992
• Complete Demolition of X-326 old HASA.	FY 1992
• Complete Corrective Measures Studies for Quadrants I and II.	FY 1993
• Complete Gas Centrifuge Enrichment Plant (GCEP) equipment removal.	FY 1993
• Complete Demolition of X-705A Radicator.	FY 1993
• Complete Corrective Measures Implementation (CMI) Program Plan and Quadrant-specific CMI work plans.	FY 1994
• Complete Plugging and Abandonment of Legacy Wells.	FY 1995
• Complete Aboveground Storage Tank Remediation.	FY 1995

Progress Chart for
Oak Ridge Field Office: Portsmouth Gaseous Diffusion Plant*

Long-Term Objectives:

Monitor the effectiveness of the chosen remedial actions

Define the need and extent for additional remedial actions required to resolve particular contaminant problems where remedial actions have been initiated

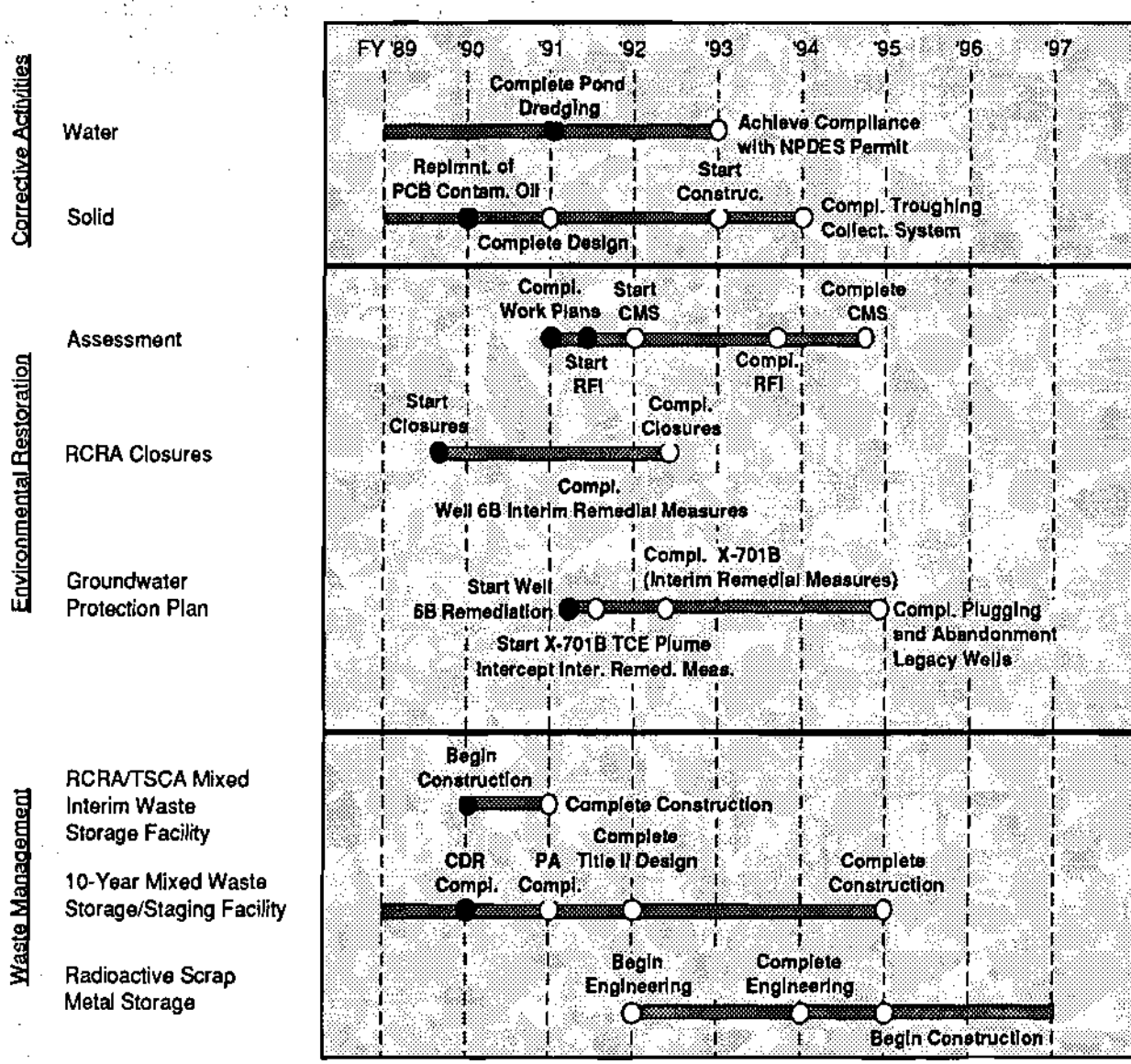
Five-Year Objectives:

Define land use contaminant problems associated with plant industrial activities

Evaluate the effectiveness of viable remedial action alternatives

Implement the most effective remedial actions

Provide compliant storage for mixed waste



Legend

- ○ Planned Milestones
- ● Completed Milestones
- ▬ Activities

Acronyms and Initialisms

CDR-	Conceptual Design Report	PA-	Preliminary Assessment
CMS-	Corrective Measures Study	PCB-	Polychlorinated Biphenyl
NPDES-	National Pollutant Discharge Elimination System	RFI-	RCRA Facility Investigation
		TCE-	Trichloroethylene
		TSCA-	Toxic Substances Control Act

* For Validated Target Level

STATUS/ACCOMPLISHMENTS

Corrective Activities

- Design for system improvements at PORTS is in process. Completion is planned for FY 1993. These improvements include pond dredging, restoration of downstream areas, process building filter room drains, and the X-621 Coal Pile Runoff Facility.
- Ventilation duct systems (gaskets) at PORTS need to be brought into compliance with PCB usage regulations under the Toxic Substances Control Act (TSCA).
- The PORTS system improvements project is currently in the conceptual engineering phase of development.
- Installation of preliminary collection systems has been initiated at PORTS to contain leaks from ventilation duct gaskets. A Federal Facility Compliance Agreement (FFCA) is being drafted by DOE with EPA to document and formalize an agreement on the approach concerning removal or replacement.
- Dredging of the J-5 Pond was completed in October 1990.
- A process to treat PCB-contaminated oil in the process lubricating oil systems is being evaluated by EPA.

Waste Management

- Ongoing activities at PORTS that meet National Pollutant Discharge Elimination System (NPDES) effluent discharge limits include the operation of pollution abatement, effluent treatment, and waste treatment facilities and processes. Specific examples of these activities include the heavy metal removal process, the biodenitrification facility, the X-705 effluent treatment facilities, the X-700 chromic acid treatment tank, and the installation of Hydrogen Zeolite Treatment systems at the X-600 Steam Plant. Routine operation of treatment systems includes managing sewage and wastewater treatment, sanitary landfills, steam plants, and precipitators.
- A proposed 38,000 ft^2 facility will meet RCRA and TSCA requirements for storage of mixed wastes at PORTS. The project, a pre-engineered warehouse with concrete slab foundation, is necessary to meet compliance regulations for long-term storage of these materials.
- A mixed waste storage facility for handling low-level, TSCA, RCRA, and intermingled mixed waste categories will serve as a 10-year storage facility. Construction will begin in FY 1993.
- Calcination of X-705 solutions at PORTS will eliminate the cadmium co-contaminated waste and reduce the volume of waste. The calcination project is in a conceptual design phase. Engineering studies to determine the most effective encapsulation media have been completed.
- Construction on a waste encapsulator to encapsulate solid toxic waste in an environmentally acceptable media for disposal is planned for FY 1994. Currently, these solid toxic waste streams have no disposal options and are in storage.
- A project to dispose of LLW scrap metal will make it possible to minimize radioactive waste on the PORTS site.
- A storage facility, including diking and a leachate collection system, is planned for temporary storage of LLW-contaminated scrap metal generated on the PORTS site.
- Construction of the interim RCRA/TSCA mixed waste storage facility began in FY 1990.
- The upgrade of the X-7725 recycle/assembly facility to meet applicable RCRA Interim Status requirements will begin in FY 1991.

Environmental Restoration

- Approximately 84 SWMUs have been identified as needing site characterization.
- Groundwater contamination is known to exist.
- Contamination plumes have been identified and are currently contained within the site boundary.
- As the SWMUs are characterized, additional soil, surface water, air, and groundwater contamination is expected to be confirmed.
- Major contaminants include technetium-99, trichloroethylene, and PCBs.
- RFI Work Plans for Quadrants I through IV were submitted.
- X-749, X231B, and X-701B Closure Option studies were submitted.
- Well 6B, X-701B, and X-749 Cap Designs were submitted.
- Well 6B Interim Remedial Measure Plan began.
- Aboveground Storage Tanks Corrective Action Work Plan was submitted.

ISSUES

Environmental, Safety, and Health Risks

- Air and water quality improvements are necessary to provide a safer work environment and better environmental protection.
- If DOE does not act within the next 3 to 5 years to remediate the groundwater contamination, then offsite contamination will probably occur; this conclusion is based on the groundwater travel times at the site.

Applicable Regulations

FFCA between DOE/EPA
Clean Water Act
NPDES
Clean Air Act
TSCA
RCRA
CERCLA/SARA
Ohio EPA Regulations
Consent Decree (DOE, Ohio)
Administrative Consent Order (EPA, DOE).
Federal and State Environmental Regulations
DOE Orders

Funding: Validated Target Level ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	6,500	0	7,000	0	11,569	0	17,328	42,397
FY92	0	8,425	0	34,561	9,790	6,793	5,210	2,280	67,059
FY93	0	20,701	0	22,370	8,668	6,308	6,332	5,083	69,462
FY94	0	6,390	0	45,565	4,206	1,425	12,543	12,543	82,672
FY95	0	0	0	52,240	4,307	1,459	12,849	12,849	83,704
FY96	0	0	0	70,390	4,204	1,424	18,790	18,790	113,598
FY97	0	0	0	26,065	4,289	1,453	20,622	20,622	73,051
FY93-97	0	27,091	0	216,630	25,674	12,069	71,136	69,887	422,487

Funding: Preliminary Unvalidated Case ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	6,500	0	7,000	0	11,569	0	17,328	42,397
FY92	0	8,425	0	34,561	9,790	6,793	5,210	2,280	67,059
FY93	0	20,701	0	22,545	12,119	9,759	8,130	5,650	78,904
FY94	0	6,390	0	47,580	3,766	1,276	6,495	12,512	78,019
FY95	0	0	0	61,650	3,628	1,139	15,131	13,516	95,064
FY96	0	0	0	70,390	3,558	1,066	18,072	18,125	111,211
FY97	0	0	0	26,065	3,485	993	20,256	20,256	71,055
FY93-97	0	27,091	0	228,230	26,556	14,233	68,084	70,059	434,253

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.

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OAK RIDGE FIELD OFFICE
INSTALLATION SUMMARY
WELDON SPRING SITE REMEDIAL ACTION PROJECT

FACILITY DESCRIPTION

This 229-acre site, located about 30 miles west of St. Louis, Missouri, was used by the Army as an ordnance works in the 1940s; then in the 1950s and 1960s the Atomic Energy Commission used Weldon Spring for the processing of uranium and thorium. The site is currently on the EPA National Priorities List, and DOE is conducting a comprehensive remedial action program, including long-term management of radiological waste.

Areas to be remediated include:

- Quarry - 9-acre site containing 95,000 yd^3 of radiologically contaminated soil and rubble and 3,000,000 gallons of radiologically or chemically contaminated water.
- Raffinate Pits - 4 waste lagoons, containing 250,000 yd^3 of raffinate sludges and 57 million gallons of radioactive or chemically contaminated water.
- Chemical Plant - 44 buildings and other structures and 470,000 yd^3 of contaminated soil and building material.
- Vicinity Properties - approximately 25,000 yd^3 of contaminated soil.
- Groundwater - nitroaromatic and radiologically contaminated groundwater at the Quarry and the Chemical Plant.

MAJOR MILESTONES

Environmental Restoration	Date
• Issue Chemical Plant Site Remedial Investigation/Feasibility Study documents to public.	4Q FY 1991
• Begin Site Water Treatment Plant Operation.	2Q FY 1992
• Begin Quarry Bulk Waste Removal.	4Q FY 1992
• Issue Site Record of Decision.	4Q FY 1992
• Complete Quarry Bulk Waste Removal.	1Q FY 1995
• Begin Disposal Facility Operation.	2Q FY 1995
• Complete Vicinity Properties Remedial Action.	2Q FY 1996
• Issue Quarry Residual Record of Decision.	1Q FY 1997
• Complete Chemical Plant Building Dismantlement.	4Q FY 1997

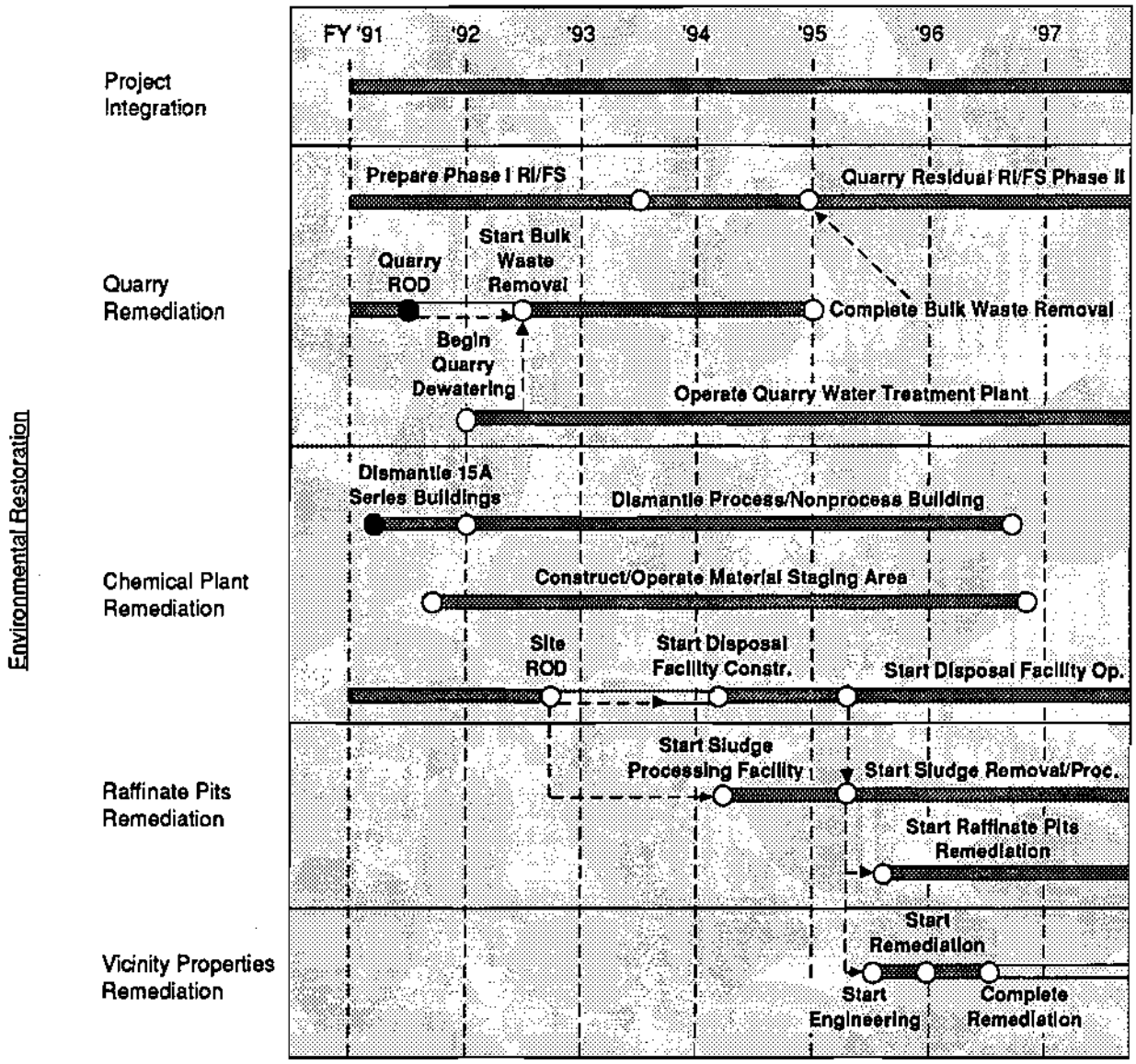
Progress Chart for Oak Ridge Field Office: Weldon Spring Site *

Long-Term Objectives:

Decontaminate/Remediate Quarry, Raffinate Pits, Vicinity Properties, Chemical Plant
Provide for Long-Term Management of the Wastes

Five-Year Objectives:

Remove Quarry Bulk Waste
Issue Site Record of Decision
Dismantle Chemical Plant Buildings
Initiate Disposal Cell Construction



Legend

- ○ Planned Milestones
- ● Completed Milestones
- → Information Flows
- ▬ Activities

Acronyms and Initialisms

RI/FS- Remedial Investigation/Feasibility Study
ROD- Record of Decision

*** For Validated Target Level**

STATUS/ACCOMPLISHMENTS (FY 1990 - 1991)

Environmental Restoration

• Issued Quarry Remedial Investigation/Feasibility Study documents for public review.	1Q FY 1990
• Awarded Quarry Staging Area Subcontract.	2Q FY 1990
• Issued Site Water Treatment Plant Engineering Evaluation/Cost Analysis to Public.	3Q FY 1990
• Completed and approved Quarry Remedial Investigation/Feasibility Study and Environmental Assessment.	4Q FY 1990
• Completed Draft Site Remedial Investigation/Feasibility Study documents.	1Q FY 1991
• Quarry Record of Decision for Bulk Waste Removal approved by DOE.	1Q FY 1991

ISSUES

Applicable Regulations

National Environmental Policy Act
CERCLA
Safe Drinking Water Act
Clean Water Act
RCRA
Clean Air Act

Environmental, Health, and Safety Risks

- No immediate health risks have been identified based on information available to date.
- Radiological and chemical contamination has migrated beyond the Quarry site boundary. A county wellfield is within one-half mile of the Quarry site.
- Radiological and chemical contamination has migrated beyond the Chemical Plant site boundary.
- A large high school is located downwind of the site and within one-half mile of the site boundary.

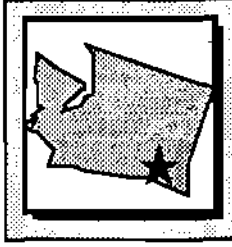
Funding: Validated Target Level ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	0	0	0	0	934	0	24,998	25,932
FY92	0	0	0	0	0	698	0	48,302	49,000
FY93	0	0	0	0	0	3,287	0	47,676	50,963
FY94	0	0	0	0	0	1,546	0	37,488	39,034
FY95	0	0	0	0	0	1,226	0	45,087	46,313
FY96	0	0	0	0	0	920	0	49,751	50,671
FY97	0	0	0	0	0	830	0	31,217	32,047
FY93-97	0	0	0	0	0	7,809	0	211,219	219,028

Funding: Preliminary Unvalidated Case ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	0	0	0	0	934	0	24,998	25,932
FY92	0	0	0	0	0	698	0	48,302	49,000
FY93	0	0	0	0	0	3,287	0	47,676	50,963
FY94	0	0	0	0	0	1,546	0	37,488	39,034
FY95	0	0	0	0	0	1,226	0	45,087	46,313
FY96	0	0	0	0	0	920	0	49,751	50,671
FY97	0	0	0	0	0	830	0	31,217	32,047
FY93-97	0	0	0	0	0	7,809	0	211,219	219,028

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.



RICHLAND FIELD OFFICE
INSTALLATION SUMMARY
HANFORD SITE

FACILITY DESCRIPTION

The Hanford Site encompasses 560 miles² within the Columbia River Basin in southeastern Washington State. This semidesert area is located to the north of Richland, Kennewick, and Pasco (population 100,000). Activities at Hanford, formerly focused on plutonium production, have shifted to environmental restoration, managing the wastes generated by past reactor and processing operations, and research and development for advanced reactors, energy technologies, basic sciences, and waste disposal technologies. Approximately 1,100 waste sites, grouped into 78 operable units in four aggregate areas, will potentially require remediation. The aggregate areas are on the National Priorities List.

MAJOR MILESTONES

The following milestones are based on the Validated Target Level (VTL) budget guidance and do not necessarily correspond to commitment dates in the Tri-Party Agreement (TPA).

Corrective Activities	Date
• Submit evaporator and double-shell tank Part B Permit Applications.	3Q FY 1991
• Complete facility effluent monitoring plans.	3Q FY 1991
• Achieve compliance with Interim Status Requirements.	4Q FY 1991
• Install 50 RCRA groundwater monitoring wells (annually).	1Q FY 1992
• Issue first annual National Emission Standards for Hazardous Air Pollutants (NESHAPs) report.	3Q FY 1992
• Start construction of PFP Enclosed Material Handling Facility.	1Q FY 1993
• Submit T Plant Treatment Tank Part B Permit Application.	4Q FY 1993
• Complete Phase IV Mixed Waste Storage Facility construction.	4Q FY 1993

Waste Management	
• Complete B Plant Pretreatment Risk Assessment.	4Q FY 1991
• Start Operation of 242-A Evaporator and Liquid Effluent Retention Facility.	1Q FY 1992
• Start Hanford Waste Vitrification Plant construction.	TBD
• Begin operation of Low-Level Waste Laboratory.	2Q FY 1993
• Complete three grout campaigns for disposal of double shell-tank waste.	3Q FY 1993
• Cease disposal of Phase I liquid effluents into soil column.	3Q FY 1995
• Begin operation of mixed waste hot cell expansion.	3Q FY 1996
• Complete 14 grout campaigns for disposal of double-shell tank waste.	4Q FY 1996
• Complete interim stabilization and isolation of 149 single-shell tanks (potentially excepting some tanks with safety concerns).	4Q FY 1997
• Begin Waste Receiving and Processing Facility, Module I Operations.	4Q FY 1997

Environmental Restoration	
• Issue Record of Decision on the surplus production reactor decommissioning Environmental Impact Statement (EIS).	3Q FY 1991
• Submit Draft Feasibility Study Phase III on Operable Unit 1100-EM-1 to the regulators.	3Q FY 1992
• Complete 183-H Solar Basin Closure.	4Q FY 1992
• Submit 300 Area Process Trench Closure/Postclosure Plan to EPA/Ecology.	4Q FY 1994

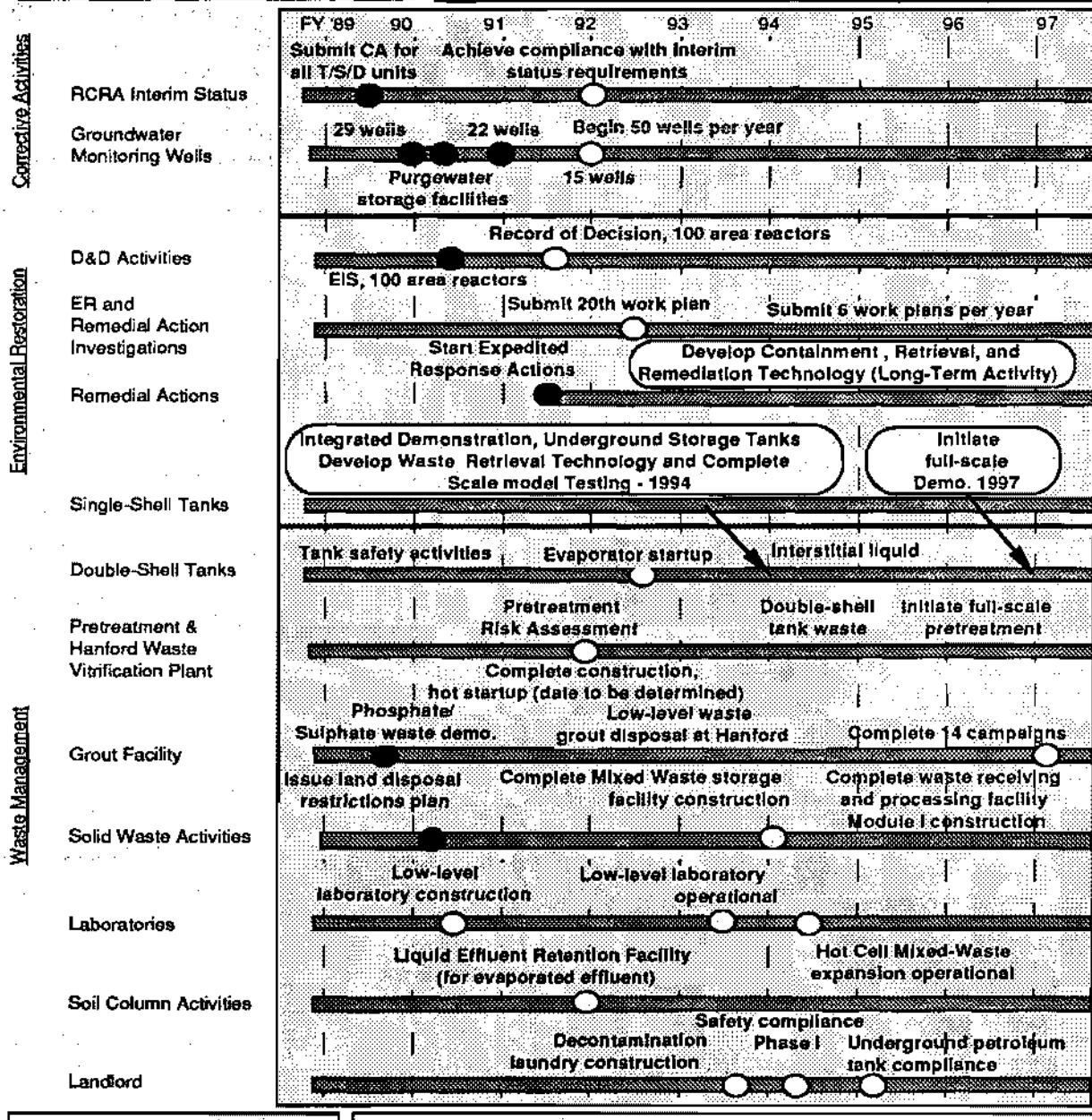
Progress Chart for Richland Field Office: Hanford Site*

Long-Term Objectives:

Clean up all operable units by FY 2018
Characterize tank wastes, remediate single-shell tanks by FY 2018
Cease disposal of Phase II effluent streams to the soil

Five-Year Objectives:

Continue aggressive waste tank safety issue resolution program
Start and continue construction of Hanford Waste Vitrification Plant
Operate grout and Waste Receiving and Packaging plants
Submit majority of remedial action work plans
Operate low-level and hot cell laboratories
Complete interim single-shell tank stabilization/isolation
Continue significant RI/FS and remediation activities



Legend

- Planned Milestones
- Completed Milestones
- Material Flow
- text — Technology Input
- Activities

Acronyms and Initialisms

CA- Compliance Assessment
D&D- Decontamination and Decommissioning
NEPA- National Environmental Policy Act
T/S/D- Treatment/Storage/Disposal

*For Validated Target Level

Technology Development

Hanford has responsibility for the Integrated Demonstration of underground storage tank remediation. This is in support of the cleanup of 149 Hanford single-shell tanks as well as tanks at other field offices. Technology Development is needed for containment, waste retrieval, waste treatment, support of tank safety issues, core sampling and analysis, and in situ treatment.

STATUS/ACCOMPLISHMENTS

Corrective Activities

- The cathodic protection system for waste management facilities was temporarily placed on hold in FY 1990. It has recently been restarted, but a new completion date has not yet been determined.
- Construction of Phase I mixed waste storage facilities was completed in FY 1990.
- The Plutonium Finishing Plant enclosed material handling project was rescoped. It is now expected to start in FY 1993.
- Interim status RCRA compliance actions for single- and double-shell tanks were completed in FY 1991.
- Preliminary inventory of hot-cell facilities having potential PCB-leaking ballasts has been completed. Routine leakers have been controlled.
- Six RCRA Part B Permits and six closure plans have been submitted to Ecology in CY 1990 in accordance with TPA milestones.
- Twenty-two groundwater monitoring wells were installed in CY 1990.

Waste Management

- Of the 1990 TPA milestones, 34 of 38 were completed on or ahead of schedule. The remaining 4 milestones were not met due to technical issues and are undergoing resolution with the State and EPA in accordance with the Federal Facilities Agreement (FFA) and Consent Order Provisions.
- Construction of four additional grout vaults (102 through 105) began and continues.
- Construction of the 242-A Evaporator effluent retention basins began and continues in preparation for evaporator restart.
- Small samples of tank 101-SY waste crust were taken due to safety concerns regarding hydrogen buildup. Additional administrative controls have been placed on a number of "watch list" tanks. A supplemental EIS was committed to for tank safety issues. A reorganization was completed to specifically address waste tank safety issues and the upgrade program.
- The decision was made to prepare an EIS on the disposition of irradiated reactor fuel. The PUREX facility was put in standby condition.
- A Land Disposal Restrictions Plan for mixed waste was issued.
- Design was completed for a new laboratory for low-level mixed waste sample analysis.

Environmental Restoration

- 183-H Solar Evaporation Basin Liquid solidification was completed in May 1990. Current work is focusing on soil sampling around and under the basins.
- The draft final surplus production reactor decommissioning EIS was completed and submitted to DOE HQ for review and approval. The EIS and ROD are currently scheduled to be completed/published in FY 1991.
- Three CERCLA or RCRA work plans were approved by the regulators in FY 1990, five additional work plans were submitted for approval, and two additional work plans were submitted for comments in FY 1990.
- Remedial Investigation/Feasibility Study activities are continuing at Operable Unit 1100-EM-1.
- Remedial Investigation/Feasibility Study activities (groundwater well installation) have been initiated on Operable Units 200-BP-1, 300-FF-1, and 300-FF-5.
- Nonintrusive activities will be initiated on selected 100 Area Operable Units during FY 1991.
- The 300 Area Process Trench effluent treatment conceptual design and a schedule for ceasing liquid discharges were completed.
- Expedited Response Actions have been initiated in FY 1991.

Technology Development

- Hexone transfer and distillation from underground storage tanks to railcars have been completed. Evaluation of mixed waste disposal technologies for the hexone is in progress.
- Underground Storage Tanks - Robotics Demonstration Team has developed a multisite team to demonstrate the use of robotics in the retrieval of wastes from underground storage tanks. A cold demonstration is scheduled to start in July 1991.
- Planning was initiated for a national arid site volatile organic carbon remediation demonstration in the 200 Area.
- In situ vitrification completed a large-scale test at the 116-B-6A crib, completed a pilot-scale test on an underground tank, and created a horizontal vitrified "floor" that may be used for containment and isolation of hazardous wastes.

ISSUES

The governing document at the Hanford Site is the Hanford FFA and Consent Order (May 1989) signed by DOE, State of Washington, and EPA. This agreement covers remediation and waste management activities required at the Hanford Site. Regulations include DOE Orders 5820.2A and 5400.1, Washington Admin. Code 173-303, and 40 CFR 61.

Assessment of risks due to wastes stored in underground single- and double-shell tanks is ongoing. Information available to date suggests a very low risk of loss of containment due to chemical reactions or other events. Other than the tank farm area, no immediate or near-term risk to the public or workers has been identified in connection with Waste Management activities.

The health risk associated with the waste in the 100, 200d, and 300 Areas at Hanford cannot be quantified until a major portion of the characterization work is completed. Monitoring shows no immediate health risk for the 100 Area; however, the potential exists since chromium, strontium-90, and tritium have been detected in the aquifer beneath the area. Health risks in the 200 and 300 Areas are thought to be similar. (Each area has different chemicals due to different past operations.) Several waste sites in the 1100 Area are within 3,000 ft of the north Richland well field, a source of drinking water. Although monitoring has shown no contamination in the wells, the 1100 Area is a high priority for cleanup because of its proximity to the drinking water supply.

Funding: Validated Target Level ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	22,398	397	556,460	87,079	100,176	0	30,675	0	797,185
FY92	10,932	3,045	756,399	7,386	118,400	6,900	29,600	0	932,662
FY93	2,405	50	893,775	6,792	145,631	693	23,190	0	1,072,536
FY94	0	0	924,823	4,958	141,963	724	30,220	0	1,102,688
FY95	0	0	981,489	5,037	150,628	724	30,438	0	1,168,316
FY96	0	0	1,144,135	5,211	159,308	724	29,845	0	1,339,223
FY97	0	0	1,256,889	5,292	172,309	724	27,205	0	1,462,419
FY93-97	2,405	50	5,201,111	27,290	769,839	3,589	140,898	0	6,145,182

Funding: Preliminary Unvalidated Case ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	22,398	397	556,460	87,079	100,176	0	30,675	0	797,185
FY92	10,932	3,045	756,399	7,386	118,400	6,900	29,600	0	932,662
FY93	2,405	50	1,260,529	18,738	190,162	1,082	45,360	0	1,518,326
FY94	0	0	1,430,372	6,073	235,818	6,697	70,834	600	1,750,394
FY95	0	0	1,551,723	4,215	324,884	8,419	77,915	0	1,967,156
FY96	0	0	1,738,687	3,911	333,824	6,622	79,039	0	2,162,083
FY97	0	0	1,741,454	3,651	297,609	5,006	127,593	0	2,175,313
FY93-97	2,405	50	7,722,765	36,588	1,382,297	27,826	400,741	600	9,573,272

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.

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ROCKY FLATS OFFICE
INSTALLATION SUMMARY
ROCKY FLATS

FACILITY DESCRIPTION

Rocky Flats (RF) is located in northern Jefferson County, approximately 16 air miles northwest of Denver, Colorado. RF covers almost 11 miles^2. RF's primary mission is to produce, in an environmentally sound manner, plutonium and other metal components for nuclear weapons. Key production activities involve component fabrication from plutonium, uranium, and nonradioactive metals. RF has specialized facilities for recovering nuclear components from obsolete weapons. Existing environmental contamination is the result of past spills, improper storage and disposal, and/or other waste management practices. Contaminated sites have been organized into 16 operable units (OUs), which contain solid waste management units to be remediated under either the CERCLA or RCRA guidelines, per the Interagency Agreement negotiated between EPA, the Colorado Department of Health (CDH), and DOE. The goal of Waste Management activities at RF is to implement waste treatment, packaging, storage, and transport functions in the most efficient manner possible, while maintaining strict regulatory compliance and protecting human health and the environment. The span of management has been expanded to include Technology Development for resolving critical waste management and environmental restoration problems and issues.

MAJOR MILESTONES

Waste Management	Date
• Begin operating the supercompactor.	4Q FY 1991
• Begin operating the Trupact II loading facility.	4Q FY 1991
• Resume shipments of low-level mixed waste (including saltcrete) to the Nevada Test Site.	FY 1992
• Implement Cost/Schedule Control Systems Criteria.	FY 1993
• Complete Sewage Treatment Plant upgrades.	FY 1993
• Complete construction of first cell of new sanitary landfill.	FY 1993
• Begin construction of Process Waste Transfer System.	FY 1995
• Begin construction of Building 374 upgrades.	FY 1995

Environmental Restoration	
• Complete OU 2 IM/IRA Construction.	FY 1991
• Complete OU 1 IM/IRA Construction.	FY 1992
• Submit Final Phase I RCRA Facility Investigation/Remedial Investigation(RFI/RI) work plan for OU 3.	FY 1992
• Submit Final Historical Release Report.	FY 1992
• Complete solar pond cleanup.	FY 1993
• Complete OU 1 Phase III Report and submit final Corrective Measures Study/Feasability Study Report.	FY 1993
• Submit Final Phase II RFI/RI Report for OU 2.	FY 1993
• Submit Final Phase I RFI/RI Work Plan for OUs 12-15.	FY 1993
• Submit CAD/Record of Decision for OU 1.	FY 1995
• Submit CAD/Record of Decision for OU 2.	FY 1995
• Begin Corrective/Remedial Action Construction for OU 1.	FY 1996
• Begin Corrective/Remedial Action Construction for OU 2.	FY 1997
• Begin Remedial Action Construction for OU 6.	FY 1997

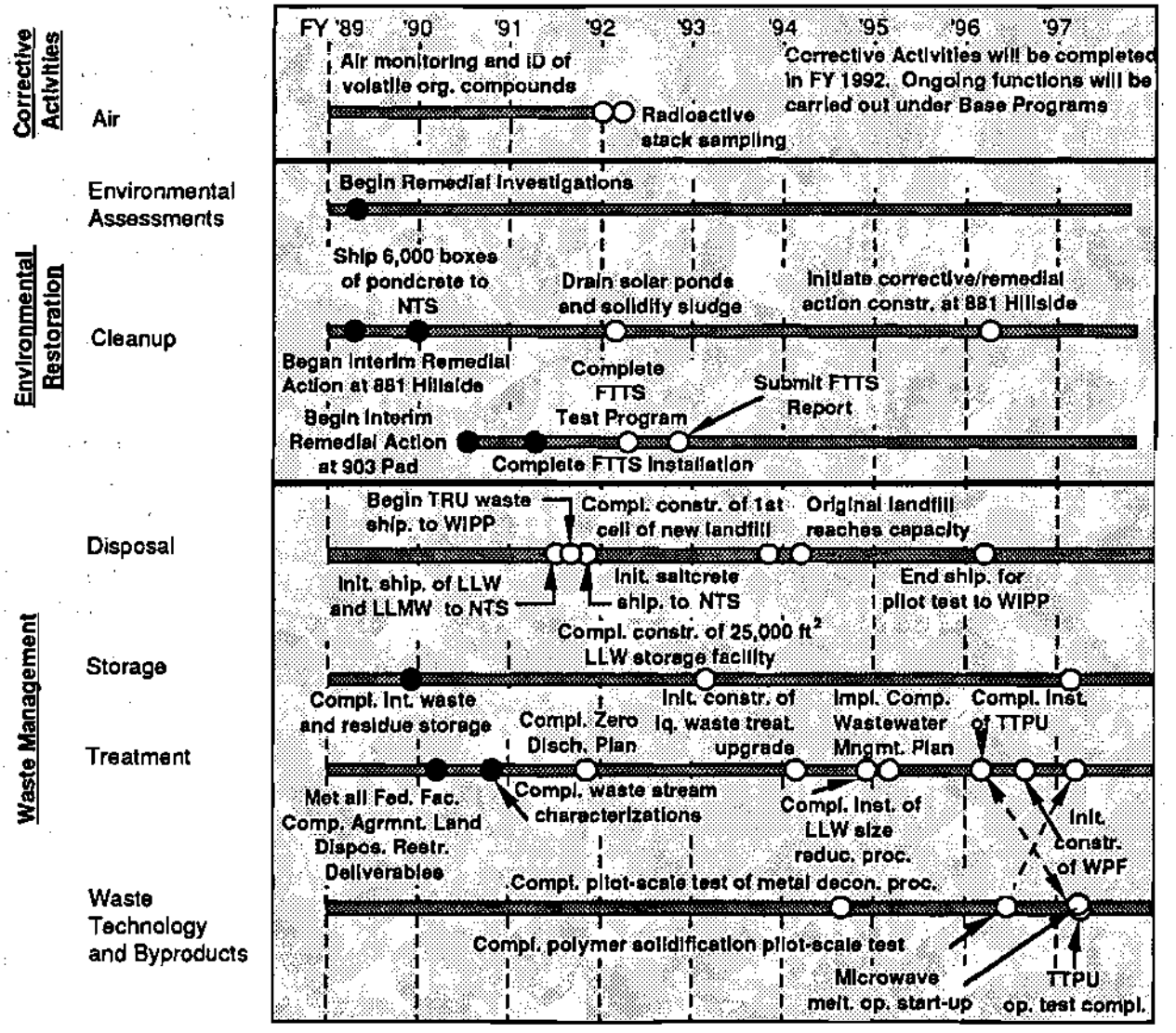
Progress Chart for Rocky Flats Office: Rocky Flats*

Long-Term Objectives:

- Clean up all operable units by 2019.
- Construct and operate new sanitary landfill.
- Implement treatment technologies for wastes subject to Land Disposal Restrictions.
- Construct permanent waste storage buildings.
- Implement Comprehensive Wastewater Management Plan.

Five-Year Objectives:

- Complete Phase I Remedial Investigations on all applicable operable units.
- Establish Land Disposal Restriction waste reduction goals.
- Initiate saltcrete shipment to Nevada Test Site.
- Initiate construction of low-level mixed waste and residue storage facilities.
- Start up low-level mixed and TRU-mixed waste microwave melting operations.
- Complete TRU waste shipments for WIPP pilot test.



Legend

- ○ Planned Milestones
- ● Completed Milestones
- → Information Flows
- ▬ Activities

Acronyms and Initialisms

ID- Identification
FTTS-Field Treatability Test System
LLMW- Low-Level Mixed Waste
LLW- Low-Level Waste
NTS-Nevada Test Site
TRU- Transuranic
TTPU- Technical Task Plan Unit
WIPP- Waste Isolation Pilot Plant
WPF- Waste Processing Facility

* For Validated Target Level

STATUS/ACCOMPLISHMENTS

Waste Management

- Restructured the Environmental Restoration and Waste Management organization to improve its effectiveness with regard to single-point accountability, clear lines of communication, and visibility at the highest levels of management.
- Issued Draft Waste Minimization Plan with reduction goals.
- Shipped 6,000 boxes of pondcrete to the Nevada Test Site for storage/disposal.
- Met all Federal Facility Compliance Agreement Land Disposal Restrictions and Residue Compliance Agreement deliverables on or ahead of schedule.
- Optimized and extended waste storage capacity by more than 12 months.
- Opened a public reading room to provide public access to all waste permitting documents, Environmental Restoration and Waste Management Plans, Environmental Restoration Assessments, compliance agreement deliverables, etc.
- Instituted the Master Planning Program and Interim Cost Schedule/Cost Control System.
- Processed more than 17 million gallons of aqueous waste through evaporation.
- Completed a waste stream characterization of 101 buildings, in which 498 processes generating 4,004 process output streams were identified.
- Completed the Waste Inventory Tracking and Control Module for the Waste and Environmental Data Management System; the remaining modules will be completed in FY 1992.

Environmental Restoration

- Submitted Final Interim Measures/Interim Remedial Action Decision Document for OU 1.
- Completed Phase I-A and Phase I-B Interim Measures/Interim Remedial Action Construction for OU 1.
- Submitted Draft Responsiveness Summary and Final Interim Measures/Interim Remedial Action Decision Document for OU 2.
- Initiated construction for IRA at OU 2 Walnut Creek Site.
- Submitted Final Past Remedy Report for OU 3 Interim Remedial Action.
- Submitted Final Historical Information/Preliminary Health Risk Assessment Report for OU 3.
- Submitted Final Sitewide Community Survey Plan.
- Submitted Draft Sitewide Quality Assurance Project Plan.
- Submitted Draft Sitewide Standard Operating Procedures.
- Submitted Draft Sitewide Plan for Prevention of Contaminant Dispersion.
- Submitted Draft Sitewide Treatability Study Plan.
- Submitted Draft Sitewide Community Relations Plan.
- Submitted Final Sitewide Health and Safety Plan.
- Submitted draft work plan for Radionuclide Discharge Limits.
- Submitted OU 2 Final Phase II RFI/RI.
- Submitted OU 1 Final Phase III RFI/RI.
- Submitted Draft Phase I RFI/RI for OUs 4, 7, 9, and 11.

ISSUES

Waste Management

Applicable regulations and compliance agreements include:

- Agreement-in-Principle, dated June 16, 1989, between DOE and CDH.
- Clean Air Act.
- Clean Water Act.
- Colorado Hazardous Waste Regulations.
- Colorado Hazardous Waste Management Act.
- DOE Orders.
- Hazardous and Solid Waste Amendments.
- Federal Facility Compliance Agreements.
- Residue Compliance Agreement.
- National Emissions Standards for Hazardous Air Pollutants.
- National Environmental Policy Act.
- National Pollutant Discharge Elimination System.
- RCRA.
- Toxic Substances Control Act.

Environmental Safety and Health Risks:

- RF is not a disposal site. All radioactive wastes must be disposed of at another DOE facility. Disposal of low-level mixed waste is a primary concern.
- Storage of saltcrete, a low-level mixed waste, is a potential waste management problem. Much of this waste is stored outside, with little protection from the elements, possibly resulting in the leaching out of nitrates. This waste is scheduled for disposal at the Nevada Test Site after repackaging.
- RF is located upgradient of the drinking water supply reservoirs of Westminster and Broomfield, Colorado. It is of utmost importance to monitor and control all water releases from the plant site.

Environmental Restoration

Applicable regulations and compliance agreements include

- Agreement-in-Principle of June 16, 1989, between DOE and CDH.
- Colorado Hazardous Waste Amendment Act.
- CERCLA.
- DOE Orders.
- RCRA.
- Interagency agreement dated January 22, 1991, between DOE, EPA, and CDH.

Environmental Safety and Health Risks:

- No immediate health risks have been identified, based on information available to date. However, health risks are not fully quantified, pending the ongoing background characterization programs and site-specific risk assessments.
- The primary present concern is groundwater contaminated with volatile organic compounds, which was the principal DOE Environmental Survey Prioritization Report. This groundwater has not breached the RF boundary. Two interim remedial actions are under way to capture and minimize groundwater migration from contaminated areas.

Funding: Validated Target Level ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	1,381	0	89,904	0	33,138	0	31,862	0	156,285
FY92	2,251	0	95,041	0	45,965	0	4,035	0	147,292
FY93	0	0	94,108	0	33,393	0	21,607	0	149,108
FY94	0	0	106,570	0	40,344	0	14,981	0	161,895
FY95	0	0	117,503	0	43,089	0	15,457	0	176,049
FY96	0	0	129,253	0	30,725	0	31,398	0	191,376
FY97	0	0	142,178	0	35,683	0	30,151	0	208,012
FY93-97	0	0	589,612	0	183,234	0	113,594	0	886,440

Funding: Preliminary Unvalidated Case ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	1,381	0	89,904	0	33,138	0	31,862	0	156,285
FY92	2,251	0	95,041	0	45,965	0	4,035	0	147,292
FY93	0	0	123,946	0	70,854	0	84,258	0	279,058
FY94	0	0	131,261	0	56,282	0	43,069	0	230,612
FY95	0	0	176,332	0	34,500	0	41,963	0	252,795
FY96	0	0	227,060	0	26,159	0	42,928	0	296,147
FY97	0	0	223,352	0	22,940	0	30,388	0	276,680
FY93-97	0	0	881,951	0	210,735	0	242,606	0	1,335,292

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.

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SAN FRANCISCO FIELD OFFICE
INSTALLATION SUMMARY
LABORATORY FOR ENERGY-RELATED HEALTH RESEARCH

FACILITY DESCRIPTION

The DOE-owned Laboratory for Energy-Related Health Research (LEHR) occupies a 15-acre site located south of the main campus of the University of California at Davis (UCD). The site, leased from UCD, is surrounded by scattered campus research facilities and private farms. For more than 30 years, the laboratory was used by UCD to conduct a DOE-sponsored research program on the health effects of exposure to low levels of radiation. Research activities potentially contaminated five buildings, outdoor dog pens/cages, and a tank trailer and generated radioactive and mixed sludge wastes contained in 17 underground septic tanks. Soil was also contaminated by the onsite burial of radioactively contaminated wastes in trenches and pits. Some chemical and radioactive contaminants may have reached the groundwater.

MAJOR MILESTONES

Environmental Restoration	Date
• Complete National Environmental Policy Act (NEPA) documentation for the decontamination and decommissioning (D&D) of building and associated facilities.	4Q FY 1991
• Complete Interim Action (Sludge, Tanker, and cobalt-60 source disposal).	2Q FY 1992
• Complete Phase II soil and groundwater characterization/assessment.	3Q FY 1992
• Complete NEPA documentation for soil and groundwater remediation.	4Q FY 1992
• Complete D&D of building and associated facilities.	4Q FY 1993
• Complete Phase III soil and groundwater characterization/assessment.	1Q FY 1994
• Complete soil and groundwater remedial design.	3Q FY 1995
• Initiate groundwater remediation.	3Q FY 1995
• Complete soil remediation.	4Q FY 1995

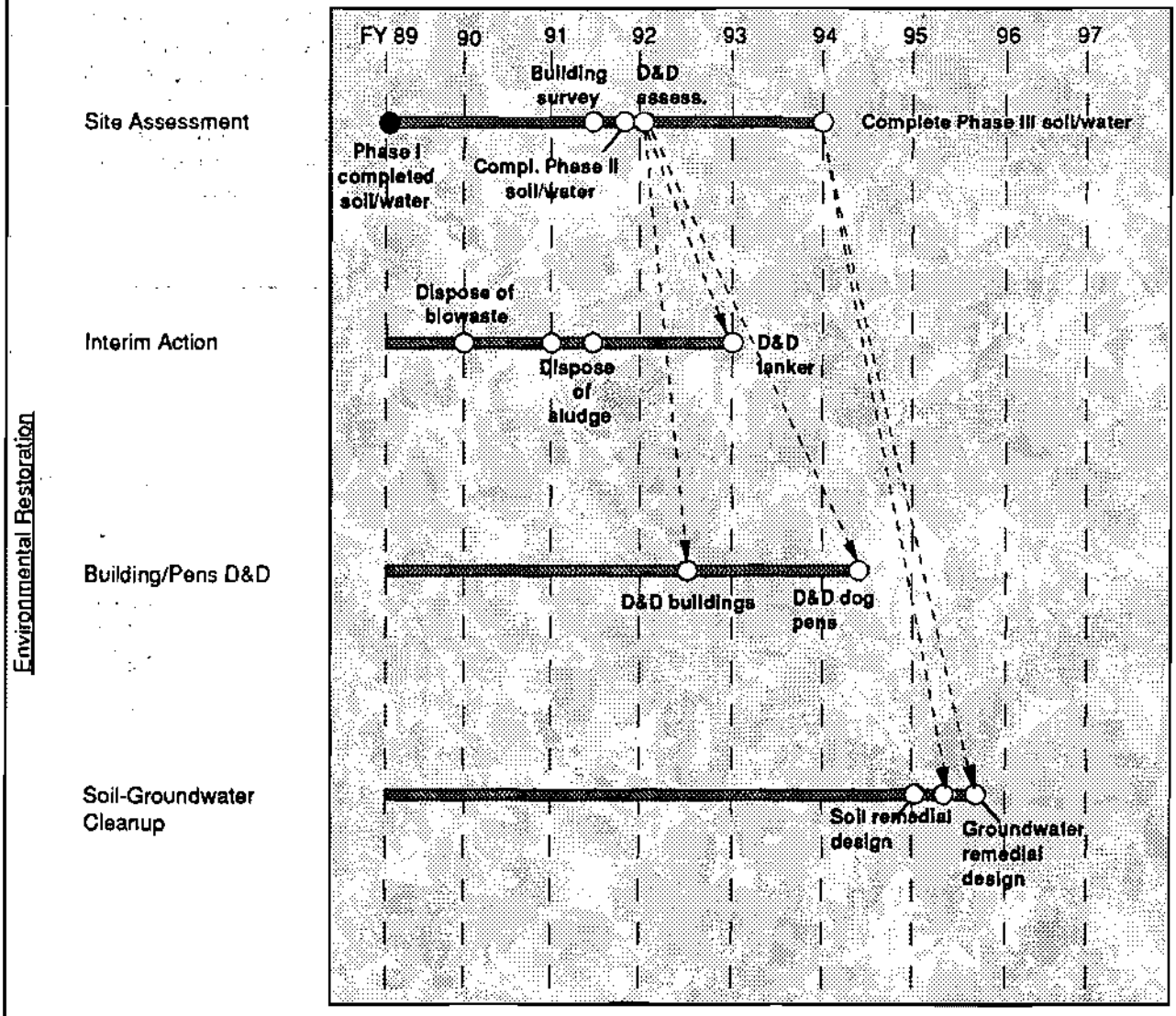
Progress Chart for
San Francisco Field Office: Laboratory for Energy-Related Health Research*

Long-Term Objectives:

Same as the Five-Year Objectives. Cleanup to be completed by FY 1995 and 95 percent of the assessment done by FY 1997.

Five-Year Objectives:

Complete Site Assessment
Complete Interim Actions
D&D buildings and Associated Facilities
Clean up Soil-Groundwater
Release Site to UCD



Legend

- ○ Planned Milestones
- ● Completed Milestones
- → Material Flows
- ▒ Activities

Acronyms and Initialisms

D&D-Decontamination and Decommissioning
UCD-University of California at Davis

*For Validated Target Level

STATUS/ACCOMPLISHMENTS

Environmental Restoration

- Packaged and shipped radioactively contaminated biological waste to the DOE Hanford Site for disposal.
- Installed 10 groundwater monitoring wells and obtained 55 soil borings.
- Completed Draft NEPA documentation for D&D of building and associated facilities.
- Packaged and shipped strontium-90 radioactive source to the DOE Argonne National Laboratory.
- Initiated (10 percent complete) activities related to the removal, treatment, packaging, and disposal of approximately 35,000 gallons of sludge waste.
- Completed reconstruction studies to evaluate potential exposure to public from past operation of onsite cobalt-60 irradiator facility.

ISSUES

- Applicable Regulations/Agencies include: RCRA, CERCLA, Clean Water Act, Regional Water Quality Control Board, California Department of Health Services, and EPA.
- Recent analysis by EPA has concluded that the LEHR site is a likely candidate for inclusion in the National Priorities List.
- The neighboring community, regulatory agencies, Davis Natural Resource Commission, and the local press are closely monitoring site restoration activities and progress.
- Potentially affected water is a drinking water source for a large number of neighboring farmers. Bottled drinking water is being provided to several farmers' homes.
- Eventual cost allocation for cleanup of commingled contamination (landfill) must be negotiated with UCD.

Funding: Validated Target Level ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	0	0	0	0	600	0	407	1,007
FY92	0	0	0	0	0	1,833	0	3,600	5,433
FY93	0	0	0	0	0	1,138	0	2,500	3,638
FY94	0	0	0	0	0	1,865	0	5,200	7,065
FY95	0	0	0	0	0	385	0	8,369	8,754
FY96	0	0	0	0	0	278	0	3,434	3,712
FY97	0	0	0	0	0	268	0	1,073	1,341
FY93-97	0	0	0	0	0	3,934	0	20,576	24,510

Funding: Preliminary Unvalidated Case ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	0	0	0	0	600	0	407	1,007
FY92	0	0	0	0	0	1,833	0	3,600	5,433
FY93	0	0	0	0	0	1,138	0	2,500	3,638
FY94	0	0	0	0	0	1,865	0	5,200	7,065
FY95	0	0	0	0	0	385	0	8,369	8,754
FY96	0	0	0	0	0	278	0	3,434	3,712
FY97	0	0	0	0	0	268	0	1,073	1,341
FY93-97	0	0	0	0	0	3,934	0	20,576	24,510

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.

SAN FRANCISCO FIELD OFFICE
INSTALLATION SUMMARY
LAWRENCE BERKELEY LABORATORY

FACILITY DESCRIPTION

The Lawrence Berkeley Laboratory (LBL) site consists of 130 acres located in an urban environment on land leased to DOE from the University of California. The site is bordered on the north by predominantly single-family homes and on the west by multiunit dwellings, student residence halls, and commercial districts. LBL activities include the operations of particle accelerators, chemistry and biomedical research laboratories, and supporting facilities. Principal environmental concerns at LBL involve the potential release of heavy metals and other pollutants to the sanitary sewer system from current operations and soil and groundwater contamination that may have occurred from past operations. A project is currently under way to assess and characterize the extent of any existing sitewide soil and water contamination.

MAJOR MILESTONES

Corrective Activities	Date
• Complete Air Toxics Facility Assessment and Rehabilitation (Building 70A) preliminary design.	1Q FY 1992
• Complete final design for underground storage tank (UST) removal.	3Q FY 1992
• Complete Air Toxics Facility Assessment and Rehabilitation (Building 70A) final design.	4Q FY 1992
• Complete UST construction and installation.	2Q FY 1993
• Complete Air Toxics Facility Assessment and Rehabilitation (Building 70A) construction.	4Q FY 1993
• Complete Sanitary Sewer Monitoring System.	4Q FY 1993

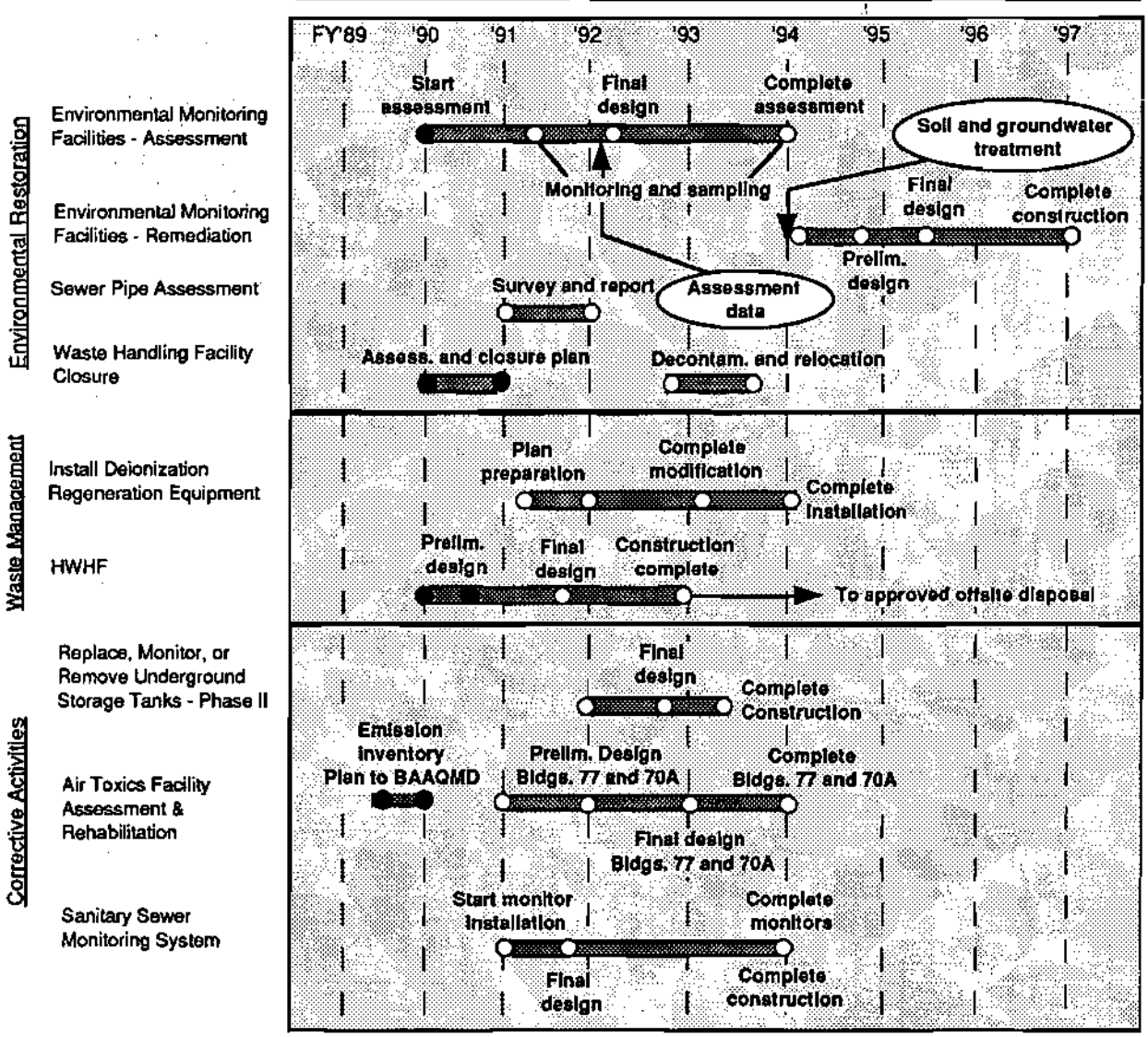
Waste Management	
• Complete existing Deionization Regeneration Equipment system modifications.	1Q FY 1992
• Begin Deionization Regeneration Equipment installation.	4Q FY 1992
• Complete Hazardous Waste Handling Facility (HWHF).	4Q FY 1992
• Complete high-efficiency particulate air filter Installation in HWHF.	1Q FY 1993
• Complete Deionization Regeneration Equipment installation.	3Q FY 1993

Environmental Restoration	
• Complete Sewer Pipe Assessment Report.	1Q FY 1992
• Complete Sitewide Assessment Remediation Investigation.	4Q FY 1992
• Complete Sitewide Assessment Feasibility Study.	2Q FY 1993
• Complete existing Waste Handling Facility Closure.	2Q FY 1993
• Complete Sitewide Assessment Remediation Plan.	4Q FY 1993
• Complete Sitewide Assessment monitoring and sampling.	4Q FY 1993
• Complete Environmental Remediation preliminary design.	4Q FY 1994
• Complete Environmental Remediation final design.	2Q FY 1995
• Complete Environmental Remediation construction.	4Q FY 1997

Progress Chart for San Francisco Field Office: Lawrence Berkeley Laboratory*

Long-Term Objectives:
Monitor and assess LBL operations to ensure against any significant threat to the environment
Manage waste handling operations in an environmentally sound and cost-effective manner

Five-Year Objectives:
Bring all LBL operations into Federal, State, and local environmental regulatory compliance
Assess potential soil and groundwater contamination and perform any required remediation
Upgrade waste handling facilities/procedures to comply with RCRA Part B Permit requirements



Legend

- ○ Planned Milestones
- ● Completed Milestones
- - → Information Flows
- → Material Flows
- (text) Technology Input
- ▬ Activities

Acronyms and Initialisms

BAAQMD- Bay Area Air Quality Management Division

*For Validated Target Level

STATUS/ACCOMPLISHMENTS

Corrective Activities

- Air Toxics Facility Assessment & Rehabilitation Emission Inventory Plan (EIP) sent to BAAQMD in the first quarter of FY 1990.
- Air Toxics Facility Assessment & Rehabilitation (Building 2) modifications began in the fourth quarter of FY 1990.
- Plan of action for the Sanitary Sewer Monitoring System was submitted to East Bay Municipal Utilities District.

Waste Management

- A second draft of the National Environmental Policy Act Environmental Assessment for the HWHF was completed and submitted to DOE Headquarters for review and approval on February 25, 1991.
- Preliminary design for the HWHF was completed on March 1, 1990; the final design is 70 percent complete.
- Second submittal of application for renewal of LBL's RCRA Part B Permit was transmitted to the State regulatory agency for review and approval on March 29, 1991.

Environmental Restoration

- Preliminary sitewide assessment activities including sampling and analysis began in the first quarter of FY 1990 using institutional overhead funding. These activities resulted in a published report entitled *Preliminary Environmental Investigations at the Lawrence Berkeley Laboratory* in November 1990.
- Assessment and closure plan for the existing LBL Waste Handling Facility as Sitewide assessment and characterization activities were initiated in FY 1991 with Environmental Restoration funding.
- Project funding guidance was provided in December 1990; a sitewide Preliminary Assessment report is currently being prepared.

ISSUES

Application for a renewal of LBL's RCRA Part B Permit is still pending. The new submittal to the California Department of Health Services is expected to fulfill all requirements.

As a result of new guidance on Corrective Activities, planned projects for FY 1993 and beyond are being rescoped and rescheduled for consideration by the Office of Energy Research to ensure that identified laboratory facilities are upgraded to meet applicable regulatory compliance standards.

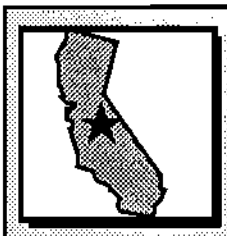
Funding: Validated Target Level ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	2,015	0	0	0	4,118	0	0	6,133
FY92	0	4,980	0	0	0	1,559	0	0	6,539
FY93	0	0	0	5,883	0	2,700	0	0	8,583
FY94	0	0	0	9,443	0	5,649	0	0	15,092
FY95	0	0	0	8,940	0	6,474	0	0	15,414
FY96	0	0	0	8,932	0	5,799	0	0	14,731
FY97	0	0	0	9,616	0	6,258	0	0	15,874
FY93-97	0	0	0	42,814	0	26,880	0	0	69,694

Funding: Preliminary Unvalidated Case ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	2,015	0	0	0	4,118	0	0	6,133
FY92	0	4,980	0	0	0	1,559	0	0	6,539
FY93	0	0	0	6,283	0	2,700	0	0	8,983
FY94	0	0	0	9,443	0	5,649	0	0	15,092
FY95	0	0	0	8,940	0	6,474	0	0	15,414
FY96	0	0	0	8,932	0	5,799	0	0	14,731
FY97	0	0	0	9,616	0	6,258	0	0	15,874
FY93-97	0	0	0	43,214	0	26,880	0	0	70,094

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.



SAN FRANCISCO FIELD OFFICE
INSTALLATION SUMMARY
LAWRENCE LIVERMORE NATIONAL LABORATORY

FACILITY DESCRIPTION

Lawrence Livermore National Laboratory (LLNL), an energy and defense research facility, consists of the main Livermore Site and Site 300. The Livermore Site, 1 mile^2 in size, is located approximately 4 miles from Livermore, California. The city of approximately 50,000/medium- and high-density housing is located on the west side of the facility; to the north, south, and east are low-density industrial and agricultural areas. Site 300, 11 miles^2 in size, is a high-explosive testing facility located 15 miles east of the main site and is surrounded by low population-density agricultural land.

MAJOR MILESTONES

Corrective Activities	Date
• Install main line organics and tritium monitors.	2Q FY 1992
• Construct satellite station monitoring equipment.	4Q FY 1992
• Initiate satellite station monitoring (organics and metals).	4Q FY 1992
• Perform plant species and soil sampling.	4Q FY 1992
• Perform stack assessment for nonradiologicals.	1Q FY 1993
• Obtain tank permits (phased).	2Q FY 1994
• Obtain tank and transformer design (phased packages).	2Q FY 1995
• Continue inversion lining/replacement for sewer systems (ongoing activity).	

Waste Management	
• Perform tank farm operations.	(continuous activity)
• Perform Building 612 operations.	(continuous activity)
• Complete Permit Application preparation for Decontamination and Waste Treatment Facility (DWTF).	3Q FY 1992
• Initiate low-level waste (LLW) compliance plan.	3Q FY 1992
• Initiate RCRA closure of Areas 612-3 and B-613.	3Q FY 1992
• Conduct audits of commercial treatment and disposal sites for LLNL hazardous wastes.	(continuous activity)

Environmental Restoration	
• Complete Remedial Design (RD) - B834.	1Q FY 1993
• Complete RD - Gasoline Spill Area.	1Q FY 1993
• Complete RD - High Explosives Process Area.	1Q FY 1993
• Complete RD - Pit 6.	2Q FY 1993
• Complete Remedial Action Implementation Plan - B850.	3Q FY 1993
• Complete Remedial Action Implementation Plan - B833.	3Q FY 1993
• Complete Record of Decison (ROD)- B833.	4Q FY 1993
• Complete (ROD) - B801/B865.	4Q FY 1993
• Initiate and Perform Remediation - Main Site.	4Q FY 2019

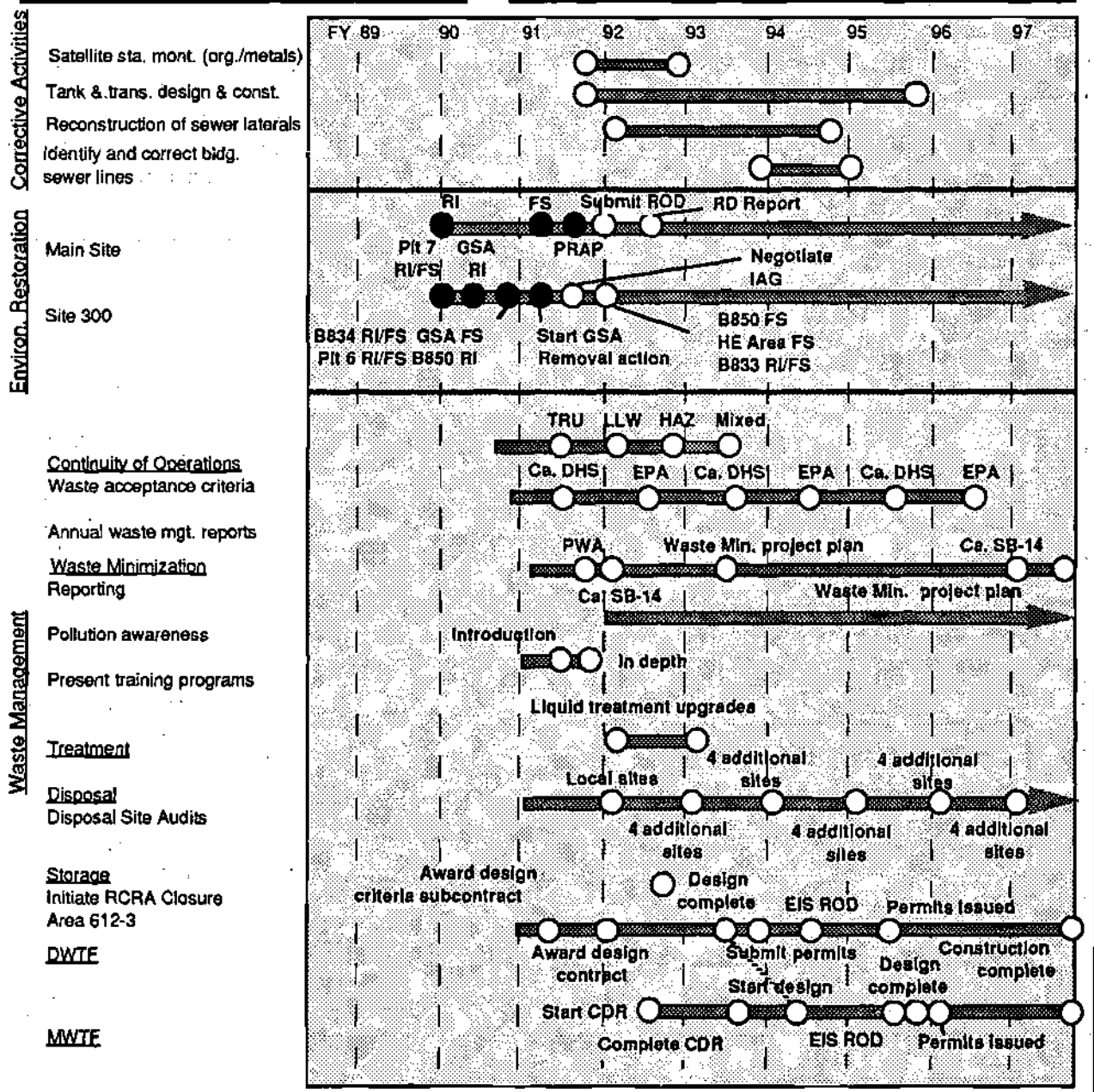
Progress Chart for
San Francisco Field Office: Lawrence Livermore National Laboratory*

Long-Term Objectives:

Bring the facility into compliance with applicable laws and regulations
Manage waste in an environmentally sound and effective manner

Five-Year Objectives:

Complete assessments and begin cleanup at the Main Site and Site 300
Implement effective waste minimization plans
Ensure compliance with environmental laws and regulations



Legend

- Planned Milestones
- Completed Milestones
- Activities

Acronyms and Initialisms

Ca. DHS-	California Dept. of Health and Safety
CDR-	Conceptual Design Report
EIS-	Environmental Impact Statement
FS-	Feasibility Study
GSA-	General Services Area
IAG-	Interagency Agreement
MWTF-	Mixed Waste Treatment Facility
PRAP-	Proposed Remedial Action Plan
PWA-	Process Waste Assessment
RI-	Remedial Investigation

* For Validated Target Level

STATUS/ACCOMPLISHMENTS

Corrective Activities

- Some operational safety procedures have been evaluated for the potential emission of toxics or radionuclides. This work has been deferred.
- Two tank system upgrades have been completed, and six others are in progress.
- Construction of the sewer monitoring upgrades and satellite monitoring stations are complete.

Waste Management

- Through the first quarter of FY 1991, shipments of hazardous wastes have exceeded receipts at the treatment, storage, and disposal facility (TSDF) for almost 1 year.
- Progress has been made in improving compliance status, responding to Tiger Team findings, and developing waste acceptance criteria, LLW compliance, safety analysis documentation, definition of new facility requirements, and the Waste Minimization program.

Environmental Restoration

Site 300 (FY 1990):

- Completed RI/FS for the Pit 7 complex.
- Completed RI for dry wells and high-explosives process area.
- Completed Site Investigation Report for B823 disposal site.
- Completed four Environmental Investigation Quarterly Reports.

Main Site (FY 1990):

- Extracted and treated 16 million gallons of groundwater with an ultraviolet (uv) light/hydrogen peroxide system.
- A second uv light/hydrogen peroxide system was installed to complete the arrest of offsite migration of contaminants.
- Total removal to date exceeds 5,000 gallons liquid equivalent to gasoline vapors at the Gasoline Spill Area and is approximately 90 percent of the original content of the vadose zone.
- All milestones in the Federal Facilities Agreement (FFA) have been met.
- Completed RI for Gasoline Spill Area/Offsite.

ISSUES

Corrective Activities

Applicable regulations: DOE Orders - 5400 series; CERCLA; Clean Air Act; National Emission Standards for Hazardous Air Pollutants (NESHAPs); Tiger Team Finding; DOE/State of California Agreement-in-Principle; California Air Toxics Law AB2588; California Public Right-to-Know Law AB2187; EPA NESHAPs Regulation 10 CFR 60; RCRA, 40 CFR 270.73 (g), 270 Subpart B, 264 Subpart X; RCRA - 40 CFR Part 265; Clean Water Act - 40 CFR Part 280 and Part 112; State - Porter Cologne Water Quality Control Act, State 23 CCR Chapter 3, Subchapter 16 and Chapter 30, Article 25.

Waste Management

The 5-year period will allow waste operations at LLNL to attain new compliance status. Specific examples of areas that are included in the budget request include DOE Order 5820.2A compliance, a quality assurance program that fulfills the requirements of DOE Order 5700.6B and that is in keeping with Tiger Team findings in the packaging and transportation area, and compliance with DOE/Nevada Field Office LLW acceptance criteria contained in NVO-325.

Environmental Restoration

A CERCLA FFA is already in place at the Livermore Main Site. At Site 300, negotiations for an FFA under CERCLA are under way. Site 300 documents have been submitted under an interim letter of agreement until a formal FFA is signed. Final dates for future milestones will be documented in the signed FFA.

Funding: Validated Target Level ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	255	0	14,103	0	11,681	0	9,298	0	35,337
FY92	17,955	0	30,640	0	6,720	0	16,580	0	71,895
FY93	15,700	0	31,091	0	3,745	0	22,270	0	72,806
FY94	9,000	0	40,547	0	465	0	21,515	0	71,527
FY95	0	0	38,497	0	279	0	16,624	0	55,400
FY96	0	0	67,777	0	255	0	15,733	0	83,765
FY97	0	0	35,296	0	232	0	15,155	0	50,683
FY93-97	24,700	0	213,208	0	4,976	0	91,297	0	334,181

Funding: Preliminary Unvalidated Case ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	255	0	14,103	0	11,681	0	9,298	0	35,337
FY92	17,955	0	30,640	0	6,720	0	16,580	0	71,895
FY93	15,700	0	59,614	0	3,890	0	25,020	0	104,224
FY94	9,000	0	35,006	0	320	0	18,765	0	63,091
FY95	0	0	65,265	0	279	0	16,624	0	82,168
FY96	0	0	29,647	0	255	0	15,733	0	45,635
FY97	0	0	35,496	0	232	0	15,155	0	50,883
FY93-97	24,700	0	225,028	0	4,976	0	91,297	0	346,001

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.

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SAN FRANCISCO FIELD OFFICE
INSTALLATION SUMMARY
SANTA SUSANA FIELD LABORATORY

FACILITY DESCRIPTION

The Santa Susana Field Laboratory (SSFL) site is composed of a total of 2,700 acres located in the Simi Hills of Ventura County, approximately 30 miles northwest of downtown Los Angeles, California. The Energy Technology Engineering Center (ETEC) portion of the SSFL consists of government owned buildings on a 90 acre site, and DOE operations are conducted in Rockwell International-owned and DOE owned facilities on a 290 acre site which include ETEC. The Rockwell facilities include former fuel fabrication facilities, a hot cell, a reactor test building, a storage vault, an onsite transport cask, and other radiologically contaminated support laboratories and areas. The ETEC facilities are used to test systems and components for use in energy, power conversion, and liquid metal development programs. At SSFL, outside of ETEC, DOE is funding the decontamination and decommissioning (D&D) of a Rockwell-owned, Nuclear Regulatory Commission-licensed hot cell that was used for DOE activities. Corrective Activities, Waste Management, and Environmental Restoration activities are ongoing at a number of facilities and areas at the site. An Agreement-in-Principle is in place with the State of California, which establishes State oversight to ensure environmental compliance at DOE facilities in California.

MAJOR MILESTONES

Corrective Activities	End Date
• Complete secondary containment at the Sodium Components Test Installation (SCTI).	2Q FY 1991
• Complete the Radioactive Materials Disposal Facility (RMDF) storage sheds.	2Q FY 1991
• Complete SCTI wastewater disposal system (begun 1Q FY 1991).	2Q FY 1992
Waste Management	
• Complete cold trap disposal.	3Q FY 1991
• Complete disposal of alkali metal.	4Q FY 1992
• Complete disposal of surplus coal.	2Q FY 1993
• Complete disposal of surplus sodium.	3Q FY 1994
Environmental Restoration	
• Complete groundwater purification system installation (start 1Q FY 1992).	3Q FY 1992
• Complete sodium disposal facility cleanup (begun 2Q FY 1991).	4Q FY 1992
• Complete Laboratory Building 059 D&D (begun FY 1988).	4Q FY 1992
• Complete SSFL Work Areas D&D (begun 2Q FY 1991).	4Q FY 1992
• Complete Bldg. 005 D&D (start 3Q FY 1992).	4Q FY 1992
• Complete Hot Laboratory (Building 20) D&D (begun 2Q FY 1988).	4Q FY 1993
• Complete PDU D&D (start 1Q FY 1993)	4Q FY 1993
• Complete FHP D&D (start 3Q FY 1993).	3Q FY 1994
• Complete RMDF D&D (start 2Q FY 1992).	4Q FY 1996

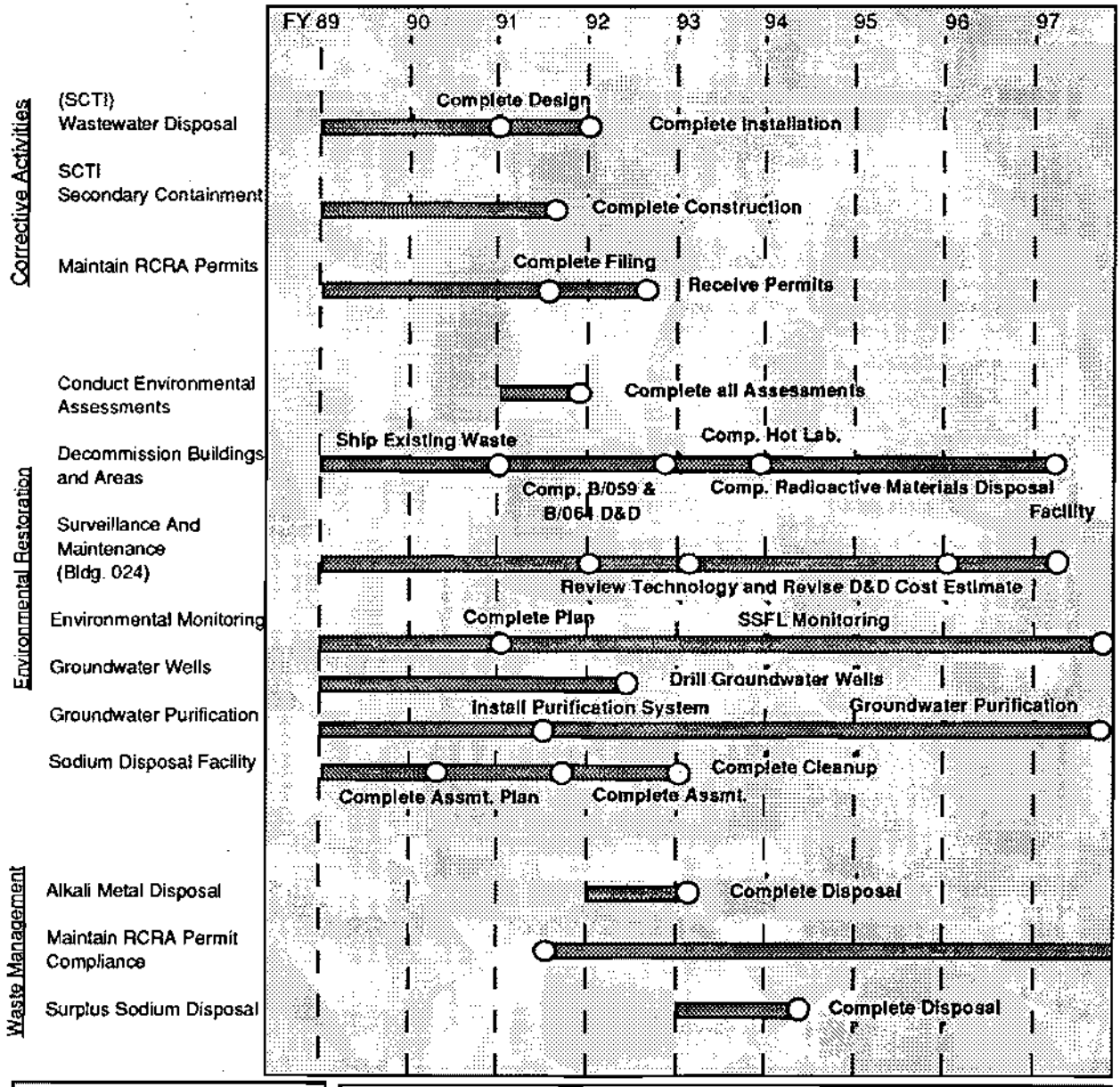
PROGRESS CHART FOR SAN FRANCISCO FIELD OFFICE: SANTA SUSANA FIELD LABORATORY *

Long-Term Objectives:

Remove all radioactive contamination from the site.
Discontinue use of radioactive materials in planned future activities.
Remediate all identified Solid Waste Management Units.
Remove volatile/organic contamination from facility groundwater.

Five-Year Objectives:

Decommission all but one (B/024) radioactive facility at SSFL.
Complete disposal of all surplus hazardous materials at SSFL.
Complete all remedial actions and installation of monitoring systems with purification systems in place and operating.
Complete Corrective Activities and maintain compliance.



Legend

- ○ Planned Milestones
- ● Completed Milestones
- ▬ Activities

DOE-ETEC-SSFL
3-12-91

Acronyms and Initialisms

D&D- Decontamination and Decommissioning
ETEC- Energy Technology Engineering Center
SSFL- Santa Susana Field Laboratory

*For Validated Target Level

STATUS/ACCOMPLISHMENTS

Corrective Activities

- SCTI wastewater disposal system alternatives studied.
- RCRA Part A Permit Application for the RMDF has been filed with State. The renewal of the permit for the Hazardous Waste Management Facility (HWMF) was submitted to the State Department of Health Services and reviewed, and the additional documentation and the filing fee were resubmitted.

Waste Management

- Developed comprehensive list of surplus inventory of hazardous material at ETEC.
- Initiated treatment of stored cold traps to begin to bring storage facility into compliance with permit.
- Identified use for some surplus material by other contractors.
- Initiated treatment of material at onsite HWMF.

Environmental Restoration

- Installed 25 groundwater monitoring wells.
- Completed preliminary planning and implementation of surface water runoff and air monitoring programs.
- Completed D&D of a number of facilities.
- Initiated D&D activities at Building 059 and the Hot Laboratory.
- Initiated planning and assessment of the remaining facilities requiring D&D.

ISSUES

Applicable Regulations

RCRA - Resource Conservation and Recovery Act
CAA - Clean Air Act
CWA - Clean Water Act
NEPA - National Environmental Policy Act
TSCA - Toxic Substances Control Act
CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act
NPDES - National Pollutant Discharge Elimination System

Environmental Safety and Health Risks

No immediate or short-term onsite or offsite health risks have been identified in connection with the ongoing or planned corrective, waste operations, or environmental restoration activities at ETEC. Additional groundwater wells and a more extensive environmental monitoring program are planned in the near term to confirm this assessment.

Funding: Validated Target Level ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	3,087	0	1,385	966	2,000	2,028	302	9,768
FY92	0	25	0	4,540	0	3,720	3,000	2,358	13,643
FY93	0	0	0	571	0	1,661	285	3,761	6,278
FY94	0	0	0	560	0	3,106	0	404	4,070
FY95	0	0	0	377	0	4,189	0	54	4,620
FY96	0	0	0	0	0	1,990	0	54	2,044
FY97	0	0	0	0	0	2,587	0	55	2,642
FY93-97	0	0	0	1,508	0	13,533	285	4,328	19,654

Funding: Preliminary Unvalidated Case ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	3,087	0	1,385	966	2,000	2,028	302	9,768
FY92	0	25	0	4,540	0	3,720	3,000	2,358	13,643
FY93	0	0	200	571	0	1,661	1,778	2,268	6,478
FY94	0	0	0	560	0	3,106	0	404	4,070
FY95	0	0	0	377	0	4,189	0	54	4,620
FY96	0	0	0	0	0	1,990	0	54	2,044
FY97	0	0	0	0	0	2,586	0	55	2,641
FY93-97	0	0	200	1,508	0	13,532	1,778	2,835	19,853

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.

SAN FRANCISCO FIELD OFFICE
INSTALLATION SUMMARY
STANFORD LINEAR ACCELERATOR CENTER

FACILITY DESCRIPTION

The Stanford Linear Accelerator Center (SLAC) is an energy research facility dedicated to theoretical and experimental research in high energy particle physics and the development of new techniques in high energy accelerators and experimental apparatus. SLAC's overall FY 1991 program budget is approximately $140M, 100 percent funded by DOE.

MAJOR MILESTONES

Waste Management

	Date
• Continue disposal of hazardous waste.	ongoing
• Continue waste minimization activities.	ongoing
• Continue disposal of radioactive waste.	ongoing
• Initiate polychlorinated biphenyl (PCB) waste removal and disposal.	1Q FY 1993
• Complete PCB waste disposal.	4Q FY 1993

Environmental Restoration

The Mission of the SLAC Environmental Restoration Program is to assess, characterize, and monitor known contaminants in the groundwater and soil. Evaluation of cleanup alternatives and the cleanup of the master substation location will be completed.

• Continue to perform quarterly monitoring/analysis.	ongoing
• Continue to submit quarterly analysis to Regional Water Quality Control Board (RWQCB).	ongoing
• Continue master substation PCB cleanup.	4Q FY 1994
• Continue groundwater cleanup evaluation.	4Q FY 1997

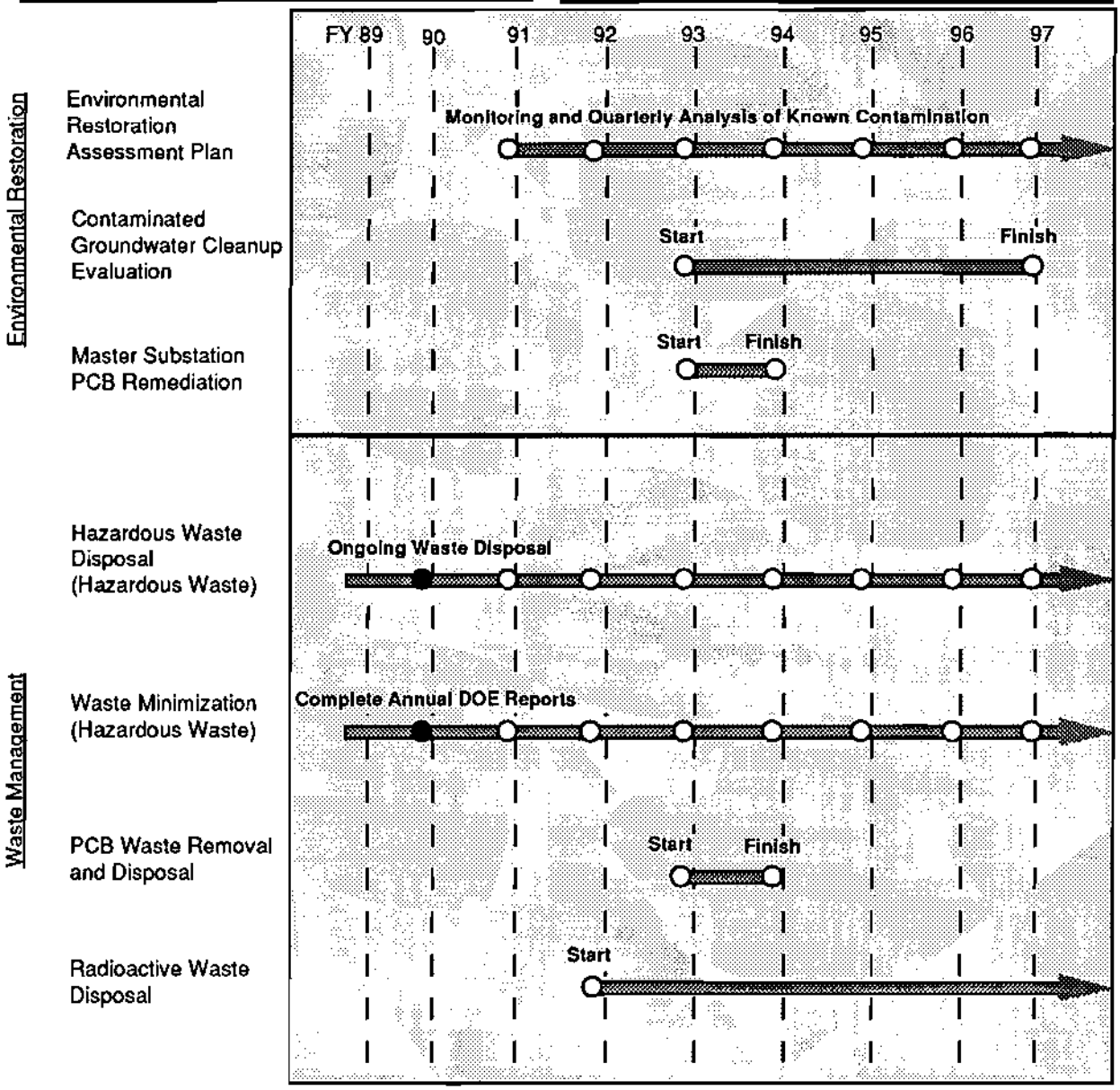
Progress Chart for San Francisco Field Office: Stanford Linear Accelerator Center*

Long-Term Objectives:

Minimize hazardous and radioactive waste
Minimize and assess soil and groundwater contamination to guard against significant threat to the environment

Five-Year Objectives:

Assess and characterize known groundwater contamination
Implement waste minimization plan
Remediate PCB-contaminated soil
Dispose of hazardous waste according to State and Federal laws



Legend

- Planned Milestones
- Completed Milestones
- Activities

Acronyms and Initialisms

PCB- Polychlorinated Biphenyl

*For Validated Target Level

STATUS/ACCOMPLISHMENTS

Waste Management

Waste Disposal:

- Set up computerized tracking system for drum containers.
- Set up uniform labeling system for drum containers.

Waste Minimization:

- Issued environmental and safety policy statements.
- Issued hazardous waste minimization policy.
- Planned solvent recycling system for Freon TF.

Environmental Restoration

This is a new program beginning in FY 1993.

ISSUES

Waste Management

The following regulations govern SLAC's waste operations:

DOE Order 5820.24
RCRA
Hazardous Solid Waste Amendments
DOE Order 5400.1
State of California (Titles 22 and 26)
California Department of Health Services, Toxic Substances Control Act
Hazardous and radioactive waste generated at SLAC will be managed and disposed of in full compliance with local, State, and Federal law. The improper management of hazardous/toxic waste could have a near-term adverse impact on workers, the public, and the environment and could subject SLAC to civil and criminal penalties.

Environmental Restoration

The California RWQCB requires quarterly assessment of eight groundwater wells surrounding the area that are contaminated with organic solvents. The RWQCB will require further analysis of four additional wells near the Plating Shop where organic solvent contamination was found in 1990.

Assessment of wells around a former leaking underground storage tank is mandated by the California RWQCB. Violation of the mandatory California RWQCB assessment order could result in both criminal and civil penalties. SLAC would also be out of compliance with DOE Order 5400.1.

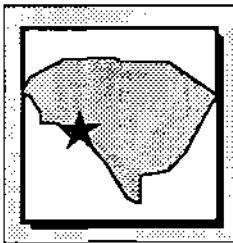
Funding: Validated Target Level ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	0	250	25	0	0	0	0	275
FY92	0	0	264	84	0	0	0	0	348
FY93	0	0	1,660	346	0	94	0	0	2,100
FY94	0	0	1,586	610	0	349	0	342	2,887
FY95	0	0	1,665	641	0	1,157	0	0	3,463
FY96	0	0	1,749	672	0	1,475	0	0	3,896
FY97	0	0	1,836	706	0	1,466	0	0	4,008
FY93-97	0	0	8,496	2,975	0	4,541	0	342	16,354

Funding: Preliminary Unvalidated Case ($ in Thousands)

	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	0	0	250	25	0	0	0	0	275
FY92	0	0	264	84	0	0	0	0	348
FY93	0	0	1,853	910	0	94	0	0	2,857
FY94	0	0	1,586	714	0	849	0	342	3,491
FY95	0	0	1,665	750	0	1,157	0	0	3,572
FY96	0	0	1,749	787	0	1,475	0	0	4,011
FY97	0	0	1,836	827	0	1,466	0	0	4,129
FY93-97	0	0	8,689	3,988	0	5,041	0	342	18,060

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.



SAVANNAH RIVER FIELD OFFICE INSTALLATION SUMMARY SAVANNAH RIVER SITE

FACILITY DESCRIPTION

The Savannah River Site (SRS) produces nuclear materials, primarily tritium and plutonium, for national defense. SRS, located in south central South Carolina, is bordered on the southwestern side by the Savannah River. The closest major population centers to SRS are Aiken, South Carolina, and Augusta, Georgia. The site comprises five reactors, two chemical separations facilities, one reactor fuel manufacturing facility, and other administration and support services facilities. The total area of the site is approximately 325 miles^2 with the production facilities occupying less than 5 percent of the site area.

MAJOR MILESTONES	Date
Corrective Activities	
• Complete construction of the K-Reactor cooling tower in accordance with the South Carolina Department of Health and Environmental Control Consent Agreement.	1Q FY 1992
Waste Management	
• Begin the In-Tank Precipitation operations in support of feed for the Defense Waste Processing Facility (DWPF).	1Q FY 1992
• Begin disposal of low-level solid waste in concrete vaults.	3Q FY 1992
• Begin construction of the Y-Area Saltstone facility for the disposal of hazardous and mixed waste.	1Q FY 1994
• Begin operating the Consolidated Incineration Facility (CIF) to treat hazardous and mixed waste.	1Q FY 1995
Environmental Restoration	
• Execute the Federal Facilities Agreement for the CERCLA waste site investigation/remediation.	4Q FY 1991
• Complete closure of F&H-Area Seepage Basins.	4Q FY 1991
• Submit Closure Plan on low-level waste burial ground.	1Q FY 1993
• Start construction of F&H-Area groundwater remediation.	3Q FY 1995
• Submit Closure Plan on currently operated sanitary landfill.	1Q FY 1996

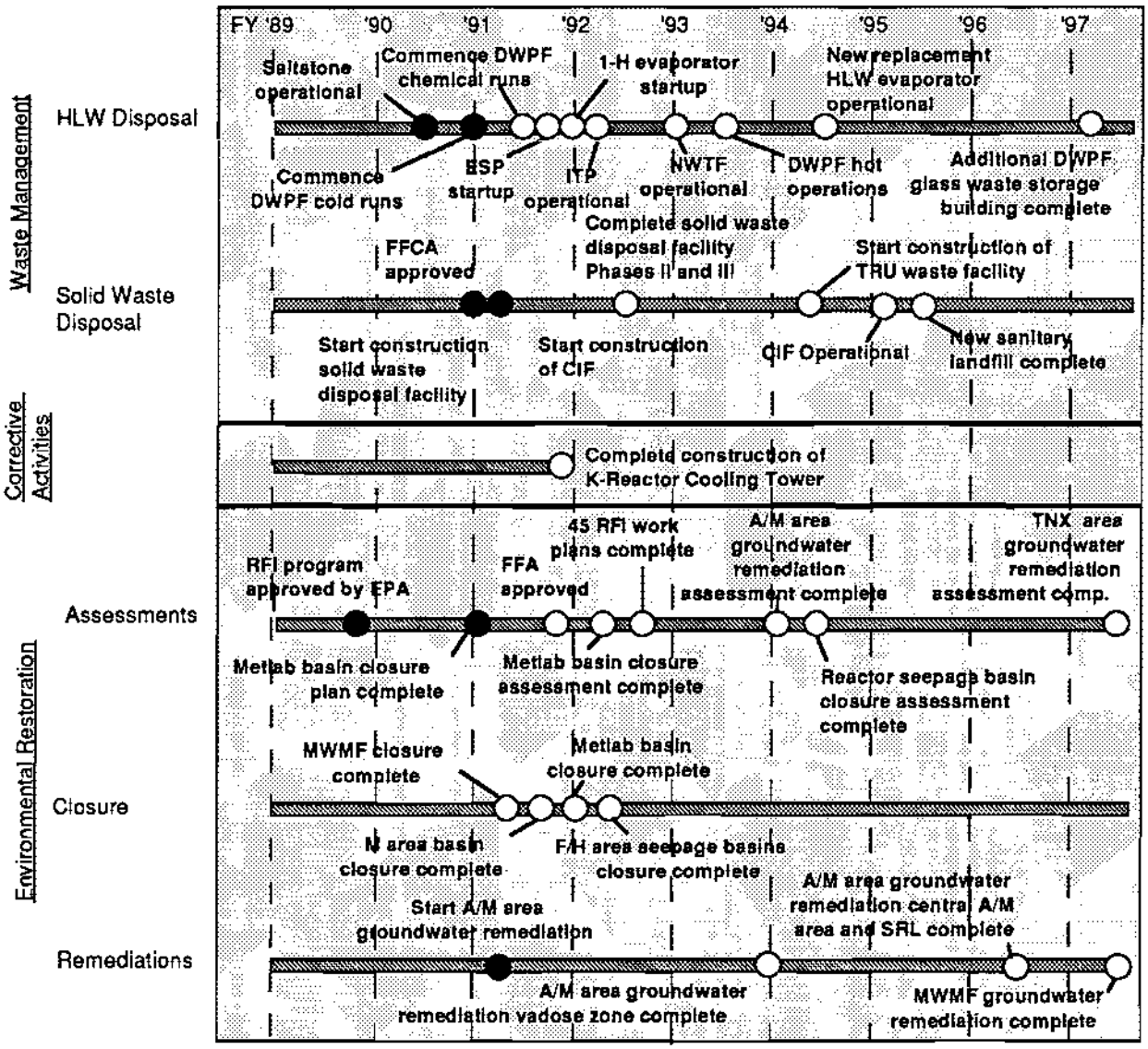
Progress Chart for Savanah River Field Office: Savannah River Site*

Long-Term Objectives:

Dispose of backlog HLW by FY 2008
Have disposal process in place for all other waste streams by FY 2001
Remediate all sites by 2019

Five-Year Objectives:

Begin glassification of HLW
Construct low, hazardous, and mixed disposal vaults and an incinerator
Complete all Environmental Restoration work plans
Perform 50 percent of investigations



Legend:

- ○ Planned Milestones
- ● Completed Milestones
- ▒ Activities

Acronyms and Initialisms:

ESP- Extended Sludge Processing
FFA- Federal Facilities Agreement
FFCA- Federal Facility Compliance Agreement
HLW- High-Level Waste
ITP- In-Tank Precipitation
MWMF- Mixed Waste Management Facility
NWTF-Nuclear Waste Transfer
RFI- RCRA Facility Investigation
SRL- Savannah River Laboratory
TRU- Transuranic

*For Validated Target Level

STATUS/ACCOMPLISHMENTS

Corrective Activities

- Completed design on the K-Reactor Cooling Tower and began construction (1Q FY 1991).

Waste Management

- Completed construction of In-Tank Precipitation facilities for DWPF in 2Q FY 1991.
- CIF startup date delayed to 1Q FY 1995.
- Integrated Cold Water runs were initiated in DWPF in 4Q FY 1990.
- Construction began on the Replacement HLW Evaporator in 2Q FY 1990.
- TRU waste continues to be precertified for shipment to Waste Isolation Pilot Plant and stored onsite in RCRA storage facilities.
- Low-level solid waste continues to be disposed of onsite in earthen trenches. Construction of the first intermediate low-level solid waste vault was initiated in 1990.
- Mixed waste is stored in RCRA-permitted facilities.
- Nonradioactive RCRA hazardous waste continues to be shipped offsite for treatment, incineration, or recovery.
- The RCRA Part B Permit and NEPA documentation have been submitted for the CIF.
- Z-Area Saltstone, the F & H-Area Effluent Treatment Facility, and the M-Area Liquid Effluent Treatment Facility continue to operate successfully.
- HLW continues to be processed in preparation for feed for DWPF.

Environmental Restoration

- Completed closure of M-Area Basin in 2Q FY 1991.
- Completed closure of MWMF in 1Q FY 1991.
- Increased A/M-Area Air Stripper System to 610-GPM.
- Submitted 27 RFI Work Plans through 1Q FY 1991 to regulatory agencies.

ISSUES

- The Savannah River Field Office will continue to study benzene abatement/alternatives in benzene generation in the ITP facility and DWPF.
- Facility design and equipment configuration will continue in the Transuranic Waste Facility (TWF) to meet regulatory and national TRU waste program requirements.
- Implementation of facility hazard classification standards is causing many new facilities to be reclassified and the estimate at completion of most projects is increasing.

Funding: Validated Target Level ($ in Thousands)

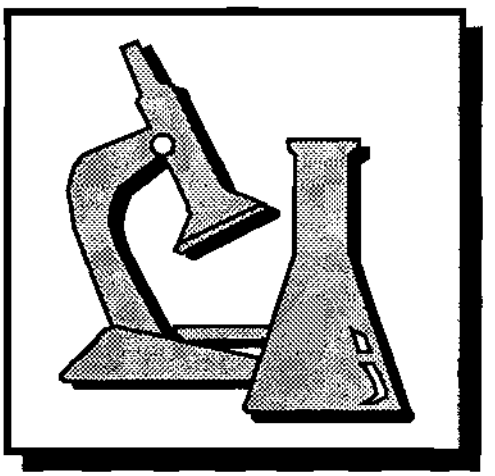
	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	47,600	0	508,536	0	19,850	0	27,650	0	603,636
FY92	0	0	491,325	0	19,794	250	35,216	0	546,585
FY93	0	0	502,301	0	19,400	250	25,410	0	547,361
FY94	0	0	541,002	0	23,749	332	37,130	0	602,213
FY95	0	0	567,487	0	26,253	308	38,170	0	632,218
FY96	0	0	612,220	0	25,659	216	42,701	0	680,796
FY97	0	0	668,792	0	24,988	194	47,454	0	741,428
FY93-97	0	0	2,891,802	0	120,049	1,300	190,865	0	3,204,016

Funding: Preliminary Unvalidated Case ($ in Thousands)

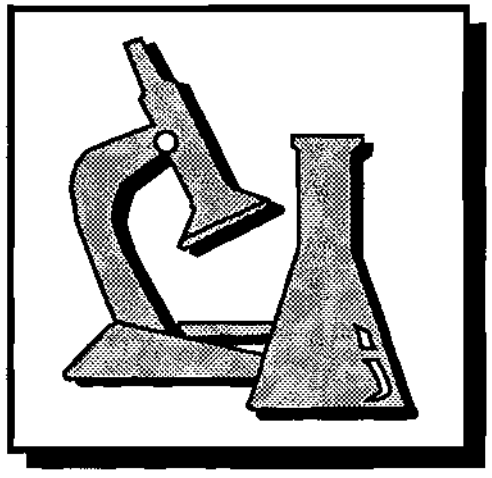
	Corrective Activities		Waste Management		Environmental Restoration				Total
					Assessment		Cleanup		
Fiscal Year	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	Defense	Nondefense	
FY91	47,600	0	508,536	0	19,850	0	27,650	0	603,636
FY92	0	0	491,325	0	19,794	250	35,216	0	546,585
FY93	0	0	722,362	0	32,623	250	43,774	0	799,009
FY94	0	0	867,938	0	35,824	0	69,057	0	972,819
FY95	0	0	1,026,087	188	35,492	0	92,125	0	1,153,892
FY96	0	0	1,022,179	203	35,769	0	102,786	0	1,160,937
FY97	0	0	990,057	219	33,184	0	98,997	0	1,122,457
FY93-97	0	0	4,628,623	610	172,892	250	406,739	0	5,209,114

Note: Where applicable, funding for compliance oversight, landlord, and program support is included in the assessment column.

Section 3
Technology Summaries



Section 3
Applications Area: A
Groundwater and Soils Cleanup



FIVE-YEAR PLAN - FY 1993-1997
Applications Area: A. Groundwater and Soils Cleanup
OVERVIEW

Needs: The identified needs of Groundwater and Soils Cleanup Integrated Demonstrations include the development of innovative in situ and ex situ treatment technologies for the removal or destruction of contaminants to acceptable levels in both arid and nonarid soils. These processes must be highly efficient and operate at reduced costs and reduced worker exposure levels. Additionally, innovative monitoring and characterization tools, such as in situ real time sensors, must be developed to reduce the costs of initial characterization and the cost of sampling and analysis during remedial processing. Also, new revegetation and stabilization techniques must be developed. The contaminants include:

- volatile, low-volatile and nonvolatile organics,
- radionuclides, including uranium and plutonium,
- nonradioactive heavy metals, and
- toxic chemicals.

Objectives: Groundwater and Soil Cleanup Integrated Demonstrations seek to develop, demonstrate, evaluate, and compare characterization, assessment, and remediation technologies. These technologies span the cradle-to-grave requirements from characterization through remediation to closure and monitoring. Acceptance of demonstrated technologies by regulatory authorities and transfer of the technologies to other markets and applications are also objectives of the demonstrations.

Benefits: The benefits of successfully demonstrated new technologies include:

- Enhanced abilities to perform characterization and cleanup of groundwater and soils at multiple sites within and without the DOE complex,
- Enhanced abilities to meet current and future cleanup commitments,
- Reduced costs, and
- Reduced public and worker exposure levels.

Summaries: Summaries of Groundwater and Soils Cleanup Integrated Demonstrations are included as follows:

- Cleanup of Volatile Organics in Saturated Soils and Groundwater.
- Cleanup of Plutonium-Contaminated Soil.
- Cleanup of Uranium-Contaminated Soil.
- Cleanup of Volatile Organics from Unsaturated Soils.
- Cleanup of Nonplutonium/Uranium Metals in Soils.
- Cleanup of Soils and Groundwater Containing Toxic Chemicals.
- Cleanup of Nonvolatile Organics in Unsaturated Soils.
- Cleanup of Nonvolatile Organics in Saturated Soils and Groundwater.

Title: Integrated Demonstration (ID) for Cleanup of Volatile Organics in Saturated Soils and Groundwater.

Objectives: The objective of this ID is to develop, demonstrate, and compare technologies to remove or destroy volatile organic contaminants, such as perchloroethylene and trichloroethylene, from saturated environments. This ID will also develop a protocol to be used by all IDs.

Benefits: The specific benefits of this ID include the cleanup of a solvent-contaminated area of the Savannah River Site whose proximity to the site boundary is of intense interest to Congress, EPA, and the State of South Carolina. These cleanup technologies will also be applicable to other sites at Idaho, Hanford, Kansas City, Lawrence Livermore National Laboratory, Oak Ridge, Paducah, and Portsmouth.

Accomplishments:

- The site was evaluated and selected.
- The planning group and technical support groups were established.
- Regulatory permits were documented.
- The following were initiated:
  - cone penetrometer feasibility test,
  - vadose zone modeling,
  - ingestion models,
  - geophysical tomography,
  - biological and chemical characterization,
  - groundwater and in situ monitoring,
  - vacuum stripping and air injection, and
  - surface and in situ bioremediation testing.
- Studies have begun of:
  - off-gas treatment,
  - surface bioreactors,
  - photocatalysis,
  - high-energy systems,
  - cryogenic barriers,
  - in situ vitrification, and
  - biofilters.
- Evaluation of demonstrated technologies and techniques has begun.
- Technology transfer and performance have begun.

Plans and Activities:

- Continue initiated activities.
- Evaluate new drilling techniques and horizontal well drilling technologies.
- Initiate molecular probe tests and electromagnetic tomographic studies.

Funding ($M)*	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
• Validated Target Level	15.0	30.0	22.0	13.0	12.0	8.0	4.0
• Preliminary Unvalidated Case	15.0	30.0	30.0	18.0	5.0	3.0	0.0

* Actual funding may differ from planned funding as required by fiscal constraints and programmatic needs.

Milestones	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
Permitting	[redacted]						
Demonstrate, Test, and Evaluate	[redacted]						

Title: Integrated Demonstration (ID) for Cleanup of Plutonium-Contaminated Soil.

Objectives: This ID seeks to develop and demonstrate characterization and remediation methods for soils with widespread surface plutonium contamination.

Benefits: The benefits include cleanup at the Nevada Test Site and offsite at Rocky Flats where levels of plutonium currently exceed EPA exposure limits and State requirements.

Accomplishments:

- Regulatory and permitting activities have begun.
- Revegetation, soil volume reduction, and soil stabilization studies have begun.
- Evaluation of the gravimetric separation system, fluid separation system, and cleanup of soils—vegetation removal methods—have been initiated.

Plans and Activities:

- Develop the demonstration plan.
- Establish the demonstration organization.
- Establish planning review and technical support group activities.
- Plan for disposal options, transportation options, separation techniques, and test plots.
- Evaluate monitoring equipment.
- Conduct Biosentinels/BioMarkers studies.
- Conduct equipment field tests.
- Conduct soil volume reduction studies.

Funding ($M)*	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
• Validated Target Level	5.3	10.0	14.0	14.0	15.0	15.0	8.0
• Preliminary Unvalidated Case	5.3	10.0	15.0	18.0	7.0	5.0	0.0

* Actual funding may differ from planned funding as required by fiscal constraints and programmatic needs.

Milestones	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
Planning	■						
Permitting	■						
Demonstrate, Test, and Evaluate		■	■	■	■	■	■

Title: Integrated Demonstration (ID) for Cleanup of Uranium-Contaminated Soil.

Objectives: This ID seeks to develop and demonstrate characterization and remediation technologies for soils contaminated with uranium and other radionuclides. Assessment criteria include removal efficiency, cost-effectiveness, waste minimization, and risk reduction.

Benefits: The benefits include cleanup of uranium-contaminated soils at the Feed Materials Production Center, which is a first priority because of offsite contamination and the major concern of the State of Ohio, and the technology exchange to other DOE installations housing radionuclide-contaminated soils.

Accomplishments:

- ID working/project groups were assembled, including planning review group, core planning group, and task teams.
- Demonstration Management Plan was issued.
- First core group meeting was conducted.

Plans and Activities:

- Conduct preliminary investigations of technologies available for demonstration from national laboratories, other government agencies, and the private sector.
- Coordinate regulatory agency interface.
- Conduct permitting activities.
- Conduct site characterization for determination of the chemical and physical state of uranium in soil.
- Conduct bench-scale treatability studies.
- Issue Request for Proposal for solicitation of private sector participation.
- Evaluate the select potential technologies for initial demonstration.
- Identify research and development needs.
- Conduct site preparation for demonstration, documents, and construction.
- Conduct initial demonstration.
- Evaluate initial demonstration and issue interim report.
- Conduct technology optimization studies.
- Evaluate optimization demonstrations and issue demonstration report.
- Evaluate closure technologies and alternatives.

Funding ($M)*	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
• Validated Target Level	6.0	9.1	5.0	9.5	20.0	18.0	10.0
• Preliminary Unvalidated Case	6.0	9.1	20.1	12.0	8.0	5.0	0.0

* Actual funding may differ from planned funding as required by fiscal constraints and programmatic needs.

Milestones	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
Planning	▬						
Permitting		▬					
Demonstrate, Test, and Evaluate			▬	▬	▬	▬	▬

Title: Integrated Demonstration (ID) for Cleanup of Volatile Organics from Unsaturated Soils.

Objectives: This ID seeks to develop, demonstrate, and compare technologies for characterization and removal/destruction of volatile organics at arid sites.

Benefits: Benefits include the applicability to priority cleanup needs at Hanford, Idaho, Los Alamos, Pantex, Rocky Flats, Lawrence Livermore National Laboratory, Sandia National Laboratory, other DOE sites, and other Federal agencies (National Aeronautics and Space Administration, DOD, etc.).

Accomplishments:

- Preparation of project/test plans and regulatory documents has been initiated.
- Planning review groups are being identified.
- Studies for characterization and monitoring techniques have been initiated.
- Demonstration of remedial techniques, such as ultrasonics and innovative drilling, were initiated.

Plans and Activities:

- Conduct planning review and technical support group activities.
- Coordinate regulatory agency interface.
- Conduct permitting activities.
- Initiate in situ monitoring and electromagnetic and seismic tomographic studies.
- Initiate studies involving soil retardation factors, hydropunch demonstration, no-stop soil sampler, and SERS detection.
- Initiate demonstration of innovative drilling techniques, biosystems, ultrasonic techniques, a solar reactor, and biofilters.
- Initiate studies on in situ heating of radial wells, steam stripping, soil washing, bioreactors, and electrical oxidation/reduction.

Funding ($M)*	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
•Validated Target Level	6.5	6.5	5.0	15.0	20.0	20.0	18.0
• Preliminary Unvalidated Case	6.5	6.5	15.1	19.0	22.0	20.0	10.0

* Actual funding may differ from planned funding as required by fiscal constraints and programmatic needs.

Milestones	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
Planning	▬						
Permitting		▬					
Demonstrate, Test, and Evaluate			▬	▬	▬	▬	▬

Title: Integrated Demonstration (ID) for Cleanup of Nonplutonium/Uranium Metals in Soils.

Objectives: This ID seeks to develop, test, and evaluate characterization and stabilization/ cleanup technologies for soils contaminated with heavy toxic metals (e.g., mercury, chromium, and lead).

Benefits: Benefits include potential solutions to the remediation of heavy metal contamination at Oak Ridge, Hanford, Idaho, and other DOE sites. For example, mercury contamination at Oak Ridge is a top priority project for remediation with the State of Tennessee and EPA Region IV because offsite contamination represents a potential health threat to the public.

Funding ($M)*	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
• Validated Target Level	0.0	2.1	1.5	1.5	5.0	10.0	18.0
• Preliminary Unvalidated Case	0.0	2.1	1.1	5.0	10.0	18.0	28.0

* Actual funding may differ from planned funding as required by fiscal constraints and programmatic needs.

Milestones	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
Planning		▬					
Permitting		▬					
Demonstrate, Test, and Evaluate			▬	▬	▬	▬	▬

Title: Integrated Demonstration (ID) for Cleanup of Soils and Groundwater Containing Toxic Chemicals.

Objectives: This ID seeks to develop, test, and evaluate characterization and stabilization/ cleanup technologies for soils contaminated with toxic chemicals.

Benefits: Benefits include toxic chemical remediation at the Sandia Site and nitrate contamination remediation at the Hanford Site as required under the Tri-Party Agreement with the State of Washington and EPA Region VI. Further benefits include remediation of toxic contamination at the Savannah River Site, Oak Ridge Reservation, Feed Materials Production Center, and other DOE sites as required by Consent Order and compliance agreement as well as State and Federal law.

Funding ($M)*	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
• Validated Target Level	0.0	2.1	1.5	1.5	5.0	12.0	14.5
• Preliminary Unvalidated Case	0.0	2.1	1.5	5.0	10.0	20.0	20.0

* Actual funding may differ from planned funding as required by fiscal constraints and programmatic needs.

Milestones	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
Planning		■					
Permitting		■					
Demonstrate, Test, and Evaluate			■	■	■	■	■

Title: Integrated Demonstration (ID) for Cleanup of Nonvolatile Organics in Unsaturated Soils.

Objectives: This ID seeks to develop, demonstrate, and compare techniques and technologies that will characterize and remove/destroy nonvolatile and semivolatile recalcitrant organic compounds in soils and groundwater at arid sites.

Benefits: Benefits include cleanup of polychlorinated biphenyls and low-volatile organics at Oak Ridge, Idaho, and the Hanford Site and the technology transfer of cleanup technologies for low-volatile and residual organic contamination at Sandia, Los Alamos, Pantex, and the Tonopah Test Range.

Funding ($M)*	**FY 91**	**FY 92**	**FY 93**	**FY 94**	**FY 95**	**FY 96**	**FY 97**
• Validated Target Level	0.0	1.1	1.1	4.0	5.0	12.0	25.0
• Preliminary Unvalidated Case	0.0	1.1	1.1	4.6	15.0	20.0	20.0

* Actual funding may differ from planned funding as required by fiscal constraints and programmatic needs.

Milestones	**FY 91**	**FY 92**	**FY 93**	**FY 94**	**FY 95**	**FY 96**	**FY 97**
Planning							
Permitting							
Demonstrate, Test, and Evaluate							

Title: Integrated Demonstration (ID) for Cleanup of Nonvolatile Organics in Saturated Soils and Groundwater.

Objectives: This ID seeks to develop, demonstrate, and compare techniques and technologies that will characterize and remove/destroy nonvolatile organic compounds that cannot be air-stripped from saturated soils.

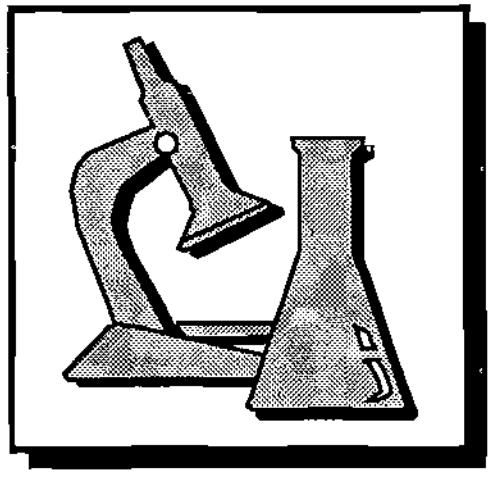
Benefits: Benefits include the development of an innovative technology that is applicable to sites with deep, subsurface polychlorinated biphenyl (PCB)-contamination (e.g., Oak Ridge). Newly developed technologies can be transferred to Savannah River, the gaseous diffusion plants, the Feed Materials Production Center, and Kansas City to address specific PCB and low-volatile organic cleanup needs.

Funding ($M)*	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
• Validated Target Level	0.0	1.0	1.0	4.0	10.0	15.8	25.0
• Preliminary Unvalidated Case	0.0	1.0	1.0	4.0	15.0	20.0	20.0

* Actual funding may differ from planned funding as required by fiscal constraints and programmatic needs.

Milestones	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
Planning		▬					
Permitting			▬				
Demonstrate, Test, and Evaluate				▬	▬	▬	▬

Section 3
Applications Area: B
Waste Retrieval and Waste Processing



FIVE-YEAR PLAN - FY 1993-1997
Applications Area: B. Waste Retrieval and Waste Processing
OVERVIEW

Needs: Large volumes of waste materials have been buried in underground disposal sites or are stored in underground tanks at DOE production facilities. Characterization, retrieval, treatment, and disposal of these wastes will require advanced material handling techniques and new technologies and processes to separate mixed waste components, reduce their volume, and either destroy or immobilize them in new waste forms. Additionally, new technologies are needed to clean and decontaminate hazardous and radioactive materials from structures and equipment so that the Department may complete its modernization and decommissioning plans.

Objectives: Waste Retrieval and Waste Processing Integrated Demonstrations seek to develop, test, evaluate, and transfer new technologies required to characterize and remediate:

- Radioactive and mixed waste currently being generated and stored in underground tanks and burial sites,
- Toxic metals and organic chemicals in RCRA wastes, and
- Structures and equipment prior to modernization or closure.

Benefits: The benefits of successfully demonstrated new technologies include:

- Enhanced abilities to characterize, retrieve, treat, dispose of, and clean up wastes stored at multiple sites within and without the DOE complex,
- Enhanced abilities to meet current future cleanup commitments,
- Reduced costs, and
- Reduced public and worker exposure levels.

Summaries: Summaries of Waste Retrieval and Waste Processing Integrated Demonstrations are included as follows:

- Buried Waste.
- Underground Storage Tanks.
- Newly Generated Mixed Waste.
- RCRA Waste Treatment.
- Combustible Waste.
- Decontamination and Decommissioning of Concrete Structures.
- Decontamination and Decommissioning of Metal Structures and Materials.
- In Situ Vitrification.
- Advanced Processing.

Title: Integrated Demonstration (ID) for Buried Waste.

Objectives: This ID seeks to compare an array of technologies for the characterization, location, and mapping of contaminants as well as retrieval, separation, concentration, treatment, and disposal of mixed wastes at buried waste sites.

Benefits: The benefits include meeting the Idaho National Engineering Laboratory commitment for Radioactive Waste Management Complex remediation and transferring technologies for remediation of buried waste to other DOE installations. Large volumes of buried waste are also present at the Hanford, Oak Ridge, Los Alamos, Savannah River, and the Nevada Test Site.

Accomplishments:

- Initiated vacuum vapor-extraction demonstration.
- Evaluated alternative plasma-processing techniques.

Plans and Activities:

- Develop a demonstration plan.
- Redirect the ID plan.
- Establish the demonstration organization.
- Conduct planning review and technical support group activities.
- Coordinate regulatory agency interface.
- Conduct permitting activities.
- Evaluate potential site and waste characterization technologies.
- Develop fissile inventory monitoring system.
- Evaluate potential retrieval technologies.
- Evaluate potential component separation technologies.
- Evaluate potential treatment and disposal technologies.
- Conduct bioremediation research and development.
- Investigate cryogenic barrier and remediation techniques.
- Evaluate closure technologies and alternatives.

Funding ($M)*	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
• Validated Target Level	30.0	30.0	25.0	25.0	23.0	18.0	10.0
• Preliminary Unvalidated Case	30.0	30.0	30.0	25.0	22.0	14.0	7.0

* Actual funding may differ from planned funding as required by fiscal constraints and programmatic needs.

Milestones	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
Planning	▬						
Permitting	▬						
Demonstrate, Test, and Evaluate	▬	▬	▬	▬	▬	▬	▬

Title: Integrated Demonstration (ID) for Underground Storage Tanks.

Objectives: This ID seeks to identify, develop, test, evaluate, and transfer technologies required to characterize and remediate radioactive and mixed waste in underground storage tanks.

Benefits: The benefits include meeting the Hanford Site's commitment to the State of Washington and transferring technologies for remediating underground storage tanks and silo problems to other DOE facilities. Underground storage tanks exist at every major DOE site as well as at many non-DOE facilities.

Accomplishments:

- Completed laboratory-scale ferrocyanide study.
- Conducted pilot-scale Catalyzed Electrochemical Plutonium Oxide Dissolution demonstration.
- Evaluated single-shell tank characterization and sampling techniques.
- Evaluated waste retrieval techniques for single-shell tanks.
- Designed protective barrier demonstration.

Plans and Activities:

- Develop the demonstration plan.
- Establish the demonstration organization.
- Conduct planning review and technical support group activities.
- Coordinate regulatory agency interface.
- Conduct permitting activities.
- Initiate pilot single-shell tank characterization testing.
- Conduct National Academy of Sciences study.
- Evaluate potential component separation technologies.
- Evaluate potential treatment and disposal technologies.
- Evaluate in situ vitrification applications.
- Initiate protective barriers testing.
- Test gas removal technologies.
- Initiate in situ vitrification testing on underground storage tanks.

Funding ($M)*	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
• Validated Target Level	19.0	25.0	23.0	27.7	25.0	20.0	12.0
• Preliminary Unvalidated Case	19.0	25.0	30.0	28.0	24.0	19.0	12.0

* Actual funding may differ from planned funding as required by fiscal constraints and programmatic needs.

Milestones:	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
Planning	■						
Permitting	■						
Demonstrate, Test, and Evaluate		■	■	■	■	■	■

Title: Newly Generated Mixed Waste Integrated Demonstration (ID).

Objectives: This ID seeks to test technologies for detection, treatment, and disposal of mixed and radioactive waste streams produced by current operations.

Benefits: The benefits include comparison and evaluation of different technologies for real-time waste characterization, pretreatment, component separation and destruction, and waste form preparation under actual field conditions for potential use at other DOE facilities.

Accomplishments:

- Conducted development tests of supercritical water oxidation.
- Conducted pilot demonstration of plasma arc processing.
- Conducted development tests of molten salt destruction.

Plans and Activities:

- Perform problem assessment.
- Develop the demonstration plan.
- Establish the demonstration organization.
- Conduct planning review and technical support group activities.
- Coordinate regulatory agency interface.
- Conduct permitting activities.
- Initiate evaluation of characterization technologies.
- Initiate the evaluation of on-line instrumentation.
- Initiate evaluation of waste treatment technologies.

Funding ($M)*	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
• Validated Target Level	2.0	14.0	7.0	8.0	9.3	15.0	20.0
• Preliminary Unvalidated Case	2.0	14.0	10.0	10.0	12.0	15.0	20.0

* Actual funding may differ from planned funding as required by fiscal constraints and programmatic needs.

Milestones	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
Planning	▬						
Permitting		▬					
Demonstrate, Test, and Evaluate			▬	▬	▬	▬	▬

Title: Integrated Demonstration (ID) for RCRA Waste Treatment.

Objectives: This ID seeks to test technologies for component detection, treatment, storage, and disposal of RCRA wastes. Particular emphasis will be placed on metal components and hazardous organics included in the land ban provisions.

Benefits: The benefits include comparison and evaluation of different technologies for real-time waste characterization, pretreatment, component separation and destruction, and waste form preparation under actual field conditions for use at other DOE facilities.

Accomplishments:

- Initiated encapsulation process development.
- Tested commercially available supercritical water reactor.
- Conducted pilot demonstration test of plasma arc processing.
- Conducted demonstration test-reactive metals disposal.

Plans and Activities:

- Perform problem assessment.
- Develop the demonstration plan.
- Establish the demonstration organization.
- Conduct planning review and technical support group activities.
- Coordinate regulatory agency interface.
- Conduct permitting activities.
- Initiate evaluation of characterization technologies.
- Initiate the evaluation of on-line instrumentation.
- Initiate evaluation of waste treatment technologies.
- Assess closure and monitoring alternatives.

Funding ($M)*	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
• Validated Target Level	9.0	21.4	14.0	17.5	25.0	20.0	18.0
• Preliminary Unvalidated Case	9.0	21.4	18.0	20.0	20.0	20.0	18.0

* Actual funding may differ from planned funding as required by fiscal constraints and programmatic needs.

Milestones	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
Planning	■						
Permitting		■					
Demonstrate, Test, and Evaluate			■	■	■	■	■

Title: Integrated Demonstration (ID) for Combustible Waste.

Objective: This ID seeks to develop and test technologies that are acceptable to regulators and the public for treatment and/or destruction of combustible components of mixed and radioactive wastes.

Benefits: The benefits include the development of technologies needed to provide thermal treatment of waste at other DOE facilities. Volume reduction achieved will lower disposal costs, enable better and faster stabilization, and destroy some hazardous components.

Accomplishments:

- Evaluated alternative plasma-processing technologies.
- Conducted pilot demonstration of plasma arc processing.
- Conducted continued development tests of supercritical water oxidation.

Plans and Activities:

- Perform problem assessment.
- Develop the demonstration plan.
- Establish the demonstration organization.
- Conduct planning review and technical support group activities.
- Coordinate regulatory agency interface.
- Conduct permitting activities.
- Initiate evaluation of waste characterization techniques.
- Initiate the evaluation of on-line instrumentation.
- Initiate evaluation of thermal treatment technologies.
- Initiate evaluation of process effluents.
- Initiate evaluation of process effluent treatment.

Funding ($M)*	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
• Validated Target Level	1.0	8.0	6.0	8.0	8.0	10.0	12.0
• Preliminary Unvalidated Case	1.0	8.0	10.0	10.0	11.0	12.0	12.0

* Actual funding may differ from planned funding as required by fiscal constraints and programmatic needs.

Milestones	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
Planning	▬						
Permitting		▬					
Demonstrate, Test, and Evaulate			▬	▬	▬	▬	▬

Title: Integrated Demonstration (ID) for Decontamination and Decommissioning of Concrete Structures.

Objectives: This ID seeks to test technologies and techniques to characterize and map contamination and clean and decontaminate concrete structures contaminated with radioactive and hazardous materials.

Benefits: The benefits include comparison and evaluation of different decontamination and decommissioning technologies under actual field conditions for potential use at other DOE facilities. Successful decontamination and decommissioning of concrete will greatly reduce the volume of wastes that must be managed as radioactive or hazardous.

Funding ($M)*	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
• Validated Target Level	0.0	5.0	5.0	5.0	5.0	12.0	12.0
• Preliminary Unvalidated Case	0.0	5.0	5.0	10.0	12.0	15.0	20.0

* Actual funding may differ from planned funding as required by fiscal constraints and programmatic needs.

Milestones	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
Planning			■				
Permitting				■			
Demonstrate, Test, and Evaluate					■	■	■

Title: Integrated Demonstration (ID) for Decontamination and Decommissioning of Metal Structures and Materials.

Objectives: This ID seeks to test technologies and techniques to characterize and map contamination, clean and decontaminate scrap metals and metallic structures contaminated with radioactive and hazardous materials, and decommission metallic process equipment and structures so that scrap materials may be safely and legally sold on the secondary materials market.

Benefits: The benefits include comparison and evaluation of different decontamination and decommissioning technologies under actual field conditions for potential use at other DOE facilities.

Funding ($M)*	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
• Validated Target Level	0.0	5.0	5.0	5.0	5.0	12.0	20.0
• Preliminary Unvalidated Case	0.0	5.0	5.0	10.0	12.0	13.0	20.0

* Actual funding may differ from planned funding as required by fiscal constraints and programmatic needs.

Milestones	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
Planning			■				
Permitting				■			
Demonstrate, Test, and Demonstrate					■	■	■

Title: Integrated Demonstration (ID) for In Situ Vitrification.

Objectives: This ID seeks to test the in situ vitrification process for the destruction of hazardous components and the immobilization of hazardous and radioactive wastes in various buried waste forms.

Benefits: The benefits include comparison and evaluation of different in situ vitrification technologies under actual field conditions for potential use at other DOE facilities.

Funding ($M)*	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
• Validated Target Level	2.0	6.0	6.0	6.0	6.0	10.0	14.0
• Preliminary Unvalidated Case	2.0	6.0	6.0	6.0	6.0	10.0	20.0

* Actual funding may differ from planned funding as required by fiscal constraints and programmatic needs.

Milestones	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
Planning	■	■					
Permitting		■					
Demonstrate, Test, and Evaluate			■	■	■	■	■

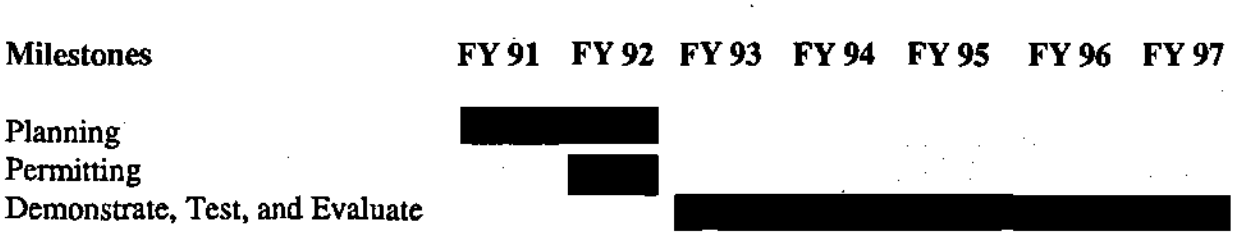
Title: Integrated Demonstration (ID) for Advanced Processing.

Objectives: This ID seeks to develop and test technologies and techniques for the treatment, storage, and disposal of high-level radioactive wastes that may contain hazardous components.

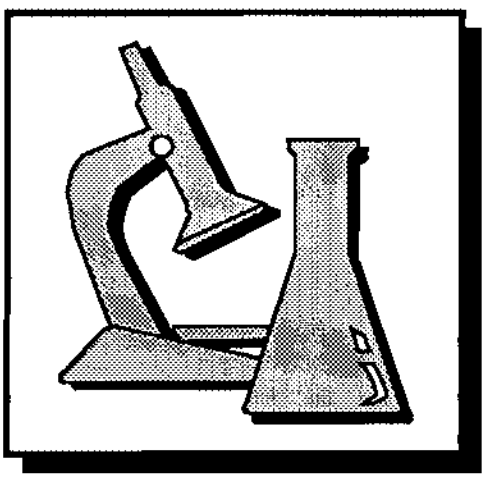
Benefits: The benefits include comparison and evaluation of different technologies under actual field conditions for potential use at DOE facilities.

Funding ($M)*	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
• Validated Target Level	2.0	4.0	4.0	4.0	4.0	10.0	15.0
• Preliminary Unvalidated Case	2.0	4.0	4.0	4.0	4.0	10.0	15.0

* Actual funding may differ from planned funding as required by fiscal constraints and programmatic needs.



Section 3
Applications Area: C
Waste Minimization



FIVE-YEAR PLAN - FY 1993-1997
Applications Area: C. Waste Minimization
OVERVIEW

Needs: Waste minimization requires the development of new technologies and methodologies to reduce or eliminate the generation of waste and new pretreatment techniques to minimize waste. Better separation and concentration processes must be developed to increase recycling. Nontoxic materials, particularly solvents, must be developed as substitutes for hazardous materials. In addition, methods must be developed for removing radionuclides from aqueous and organic degreasers. These technologies must be applicable to a broad range of manufacturing efforts involving: depleted uranium, plutonium, nonradioactive components, and electronics.

Objectives: The Waste Minimization Integrated Demonstrations seek to develop, test, evaluate, and transfer technologies that:

- Conserve, substitute, and recycle expensive and hazardous materials throughout the nuclear weapons complex and research and development laboratories;
- Reduce the amount of radioactive material disposed of as waste;
- Reduce air emissions of chlorinated hydrocarbons; and
- Reduce risks to production workers and the costs of production.

Benefits: The benefits of the Waste Minimization Integrated Demonstrations include:

- Enhanced compliance with regulatory requirements and agreements;
- Enhanced compliance with international agreements;
- Improved efficiency in the use of expensive materials;
- Improved production efficiency throughout the DOE manufacturing processes; and
- Reduced radioactive and hazardous wastes.

Summaries: Summaries of Waste Minimization Integrated Demonstrations are included as follows:

- Depleted Uranium Waste Minimization at the Oak Ridge Y-12 Plant.
- Plutonium Waste Minimization at Rocky Flats.
- Environmentally Conscious Electronics Manufacturing.
- Defense Programs/Office of Environmental Restoration and Waste Management Memorandum of Understanding.
- DOE/Air Force Memorandum of Agreement.
- Nonradioactive Components Manufacturing.
- General Waste Minimization.

Title: Integrated Demonstration (ID) for Depleted Uranium Waste Minimization at the Oak Ridge Y-12 Plant

Objectives: This ID seeks to develop uranium metal processing and recycling technologies to minimize the amount of uranium or other hazardous materials disposed of as waste.

Benefits: ID activities are focused at the Oak Ridge Y-12 Plant to reduce generation of wastes (Priorities 2 and 3) through innovative processing and recycling technologies.

Accomplishments:

- Initiated problem assessment.
- Developed demonstration structure and goal.
- Completed operational survey.
- Defined scrap recycling option.
- Developed multiyear depleted uranium manufacturing waste minimization program.
- Completed elimination of chlorinated hydrocarbons at the Y-12 Plant.

Plans and Activities:

- Develop the demonstration plan.
- Establish the demonstration organization.
- Conduct planning review and technical support group activities.
- Initiate substitution of aqueous degreasers.
- Develop massive material recycling flow sheets.
- Initiate low-level waste separation.
- Evaluate the electron beam remelting process.
- Select base slag process for use in electroslag remelt process.
- Acquire data concerning DOE-contaminated metal inventory for laser decontamination of metals development.
- Initiate chip melting equipment installation.
- Conduct plasma arc casting activities.
- Conduct electroslag casting activities.
- Initiate electron beam melting activities.
- Assess chip remelting process.

Funding ($M)*	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
• Validated Target Level	16.0	0.0	0.0	0.0	0.0	0.0	0.0
• Preliminary Unvalidated Case	16.0	0.0	5.0	0.0	0.0	0.0	0.0

* Actual funding may differ from planned funding as required by fiscal constraints and programmatic needs.

Milestones:	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
Demonstrate, Test, and Evaluate							

Title: Integrated Demonstration (ID) for Plutonium Waste Minimization at Rocky Flats.

Objectives: This ID seeks to develop plutonium metal processing and recycling technologies to minimize the amount of transuranic waste.

Benefits: Onsite storage of transuranic waste and residue at Rocky Flats is a key issue (Priority 1) under the waste management Federal Facility Compliance Agreement with the State of Colorado and EPA. Transuranic waste requiring storage and eventual disposal could be significantly reduced through technology development.

Accomplishments:

- Initiated plutonium operation survey.
- Initiated analytical support.
- Initiated problem assessment.
- Developed demonstration structure and goal.
- Developed roadmap.
- Demonstrated compatibility between supercritical carbon dioxide and plutonium.
- Established contract with Supercritical Processing.
- Successfully removed Texaco Regal R&O oil from mock parts.
- Demonstrated bagless posting to eliminate plastics from transuranic waste drums.
- Developed stainless steel reusable high-efficiency particulate air filters.

Plans and Activities:

- Establish the demonstration organization.
- Conduct planning review and technical support group activities.
- Conduct chip remelting activities.
- Conduct low-level waste separation activities.
- Conduct waste partitioning/actinide process testing.

Funding ($M)*	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
• Validated Target Case	1.0	0.0	0.0	0.0	0.0	0.0	0.0
• Preliminary Unvalidated Case	1.0	0.0	9.5	8.0	4.0	0.0	0.0

* Actual funding may differ from planned funding as required by fiscal constraints and programmatic needs.

Milestones	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
Planning							
Demonstrate, Test, and Evaluate							

Title: Integrated Demonstration (ID) for Environmentally Conscious Electronics Manufacturing.

Objectives: This ID seeks to design electronics manufacturing methods to meet the Montreal Protocol, an international requirement to reduce air emissions of chlorinated hydrocarbons, and the 1989 London Amendment. It also seeks to reduce the risk to production workers and the cost of electronics production.

Benefits: Technology demonstration activities principally focus on the Kansas City Plant for the elimination of hazardous waste streams while maintaining or improving product quality.

Accomplishments:

- Initiated problem assessment.
- Began operations survey.
- Initiated on-line characterization study.
- Began solvent substitution program.
- Initiated program on fluxless soldering.
- Began process modification program.

Plans and Activities:

- Develop the demonstration plan.
- Establish the demonstration organization.
- Conduct planning review and technical support group activities.
- Conduct study on dry process cleaning.
- Investigate solvent substitution.
- Conduct volatile organic compound abatement development.
- Perform conductive adhesive research and development.
- Investigate liquid carbon dioxide cleaning.

Funding ($M)*	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
• Validated Target Level	3.0	0.0	0.0	2.0	14.0	5.0	4.0
• Preliminary Unvalidated Case	3.0	0.0	5.0	8.0	6.0	5.0	4.0

* Actual funding may differ from planned funding as required by fiscal constraints and programmatic needs.

Milestones:	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
Planning							
Demonstrate, Test, and Evaluate							

Title: Integrated Demonstration (ID) for Defense Programs/Office of Environmental Restoration and Waste Management Memorandum of Understanding.

Objectives: This ID seeks to reduce wastes within the Defense Programs operations since 80 percent of DOE's waste is generated in its nuclear weapons complex. The ID will consider all phases involved in processing.

Benefits: The key benefit from this ID results from the application of methods from all parts of the DOE complex, other Federal agencies, and the academic and commercial sectors to the waste reduction problems of the weapons complex.

Accomplishments:

- Signed Memorandum of Understanding between DOE Defense Programs and EM.
- Initiated planning for Defense Programs waste minimization.
- Developed roadmap and planning review group.
- Initiated model process line.

Plans and Activities:

- Conduct planning review and technical support group.
- Initiate waste minimization consideration in basic product.
- Transfer solvent substitution technology.
- Model an additional Defense Program process line.

Funding ($M)*	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
• Validated Target Level	15.0	0.0	0.0	0.0	0.0	0.0	0.0
• Preliminary Unvalidated Case	15.0	0.0	20.0	20.0	20.0	22.0	20.0

* Actual funding may differ from planned funding as required by fiscal constraints and programmatic needs.

Milestones	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
Demonstrate, Test, and Evaluate	■						

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Title: DOE/Air Force Integrated Demonstration (ID).

Objectives: This ID seeks to exchange information with the United States Air Force and to pursue demonstrations that will benefit both agencies as a result of reductions in cost and time for implementation of a waste minimization approach.

Benefits: The key benefits are reductions in demonstration costs and time through shared sponsorship, exchange of information, and the incorporation of the United States Air Force research experience into the DOE complex.

Accomplishments:

- Initiated Memorandum of Understanding with Defense Programs to jointly develop aggressive waste minimization program with design laboratory/production facility coordination.
- Established joint effort with the United States Air Force to assess and develop alternatives to using chlorinated hydrocarbons in metal processing.
- Initiated Memorandum of Understanding with United States Air Force and Boeing.
- Began information transfer of data on biodegradable solvent substitutes.

Plans and Activities:

- Expand cooperative efforts.
- Conduct metal manufacturing development.
- Expand cooperative efforts to other Federal agencies and coordinate plans.
- Implement solvent substitution.
- Demonstrate metal manufacturing technologies.
- Evaluate alternate cleaning process.

Funding ($M)*	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
• Validated Target Level	2.0	0.0	2.5	3.5	0.0	0.0	0.0
• Preliminary Unvalidated Case	2.0	0.0	8.0	10.0	12.0	12.0	12.0

* Actual funding may differ from planned funding as required by fiscal constraints and programmatic needs.

Milestones	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
Planning							
Demonstrate, Test, and Evaluate							

FIVE-YEAR PLAN - FY 1993-1997
Applications Area: C. Waste Minimization
FY 1993 Startup

Title: Integrated Demonstration (ID) for Nonradioactive Components Manufacturing.

Objectives: This ID seeks to reduce the production of land-banned and other hazardous waste, particularly metals, and to develop production methods that conserve expensive materials.

Benefits: The key benefit from this ID results from waste minimization activities that are focused on processes used in manufacturing nonradioactive components of weapons at DOE weapons complex sites.

Accomplishments:

- Initiated test and evaluation of nonhazardous and "dry" alternatives to volatile organic solvents, fluxless soldering, and on-line monitoring of process streams.

Plans and Activities:

- Assess problem.
- Conduct manufacturing process study.
- Develop the demonstration plan.
- Conduct on-line monitoring.
- Perform nondestructive testing.
- Develop noncyanide plating methods.
- Initiate innovative casting techniques.
- Develop electrochemical separation techniques.
- Initiate nonchromium-based coatings activities.

Funding ($M)*	**FY 91**	**FY 92**	**FY 93**	**FY 94**	**FY 95**	**FY 96**	**FY 97**
• Validated Target Level	0.0	0.0	0.0	1.0	5.0	6.0	7.0
• Preliminary Unvalidated Case	0.0	0.0	10.0	10.0	12.4	8.0	11.1

* Actual funding may differ from planned funding as required by fiscal constraints and programmatic needs.

Milestones	**FY 91**	**FY 92**	**FY 93**	**FY 94**	**FY 95**	**FY 96**	**FY 97**
Planning			■				
Permitting			■				
Demonstrate, Test, and Evaluate				■	■	■	■

Title: General Waste Minimization Integrated Demonstration (ID) .

Objectives: This ID seeks to conserve, substitute, and recycle expensive and hazardous materials throughout the nuclear weapons complex and the research and development laboratories.

Benefits: General waste minimization activities are classified as Priorities 1, 2, or 3, depending on risk and Federal Facilities Agreement status. Waste minimization is of significant benefit to all facilities within the weapons complex and has the potential for large savings.

Funding ($M)*	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
• Validated Target Level	0.0	0.0	2.5	3.0	5.0	6.0	7.0
• Preliminary Unvalidated Case	0.0	0.0	5.0	10.0	12.0	9.0	10.0

* Actual funding may differ from planned funding as required by fiscal constraints and programmatic needs.

Milestones	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
Planning							
Startup							
Fully operational							

Section 3
Supporting Technology Summaries

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Title: Analytical Services Program (ASP).

Needs: EM programs rely on sampling and analysis data to support decisions regarding waste operations, remediation, safety, and technology development. The quality of EM program decisions is directly determined by the quality and the quantity of data developed. EM programs require that sampling and analysis operations produce data that are:

- quality assured and legally credible,
- available in a timely manner, and
- obtained in a cost-effective manner.

Objectives: ASP seeks to ensure that the data provided to EM programs are (1) of the quality and quantity necessary to meet program objectives, (2) cost-effective, and (3) timely. It serves as the focal point for DOE EM analytical laboratory policy, planning, and direction.

Benefits: The ASP of the Laboratory Management Branch (LMB) supports the environmental programs of EM-30, -40, and -50 and other DOE elements by providing support to project managers located within DOE field offices, field sites, and Headquarters. The data obtained through sampling and analysis operations are critical to attaining DOE's 30-year cleanup goal as well as to demonstrating compliance.

Accomplishments:

Initial budget outlay and projects initiation took place in January 1991. The formal ASP plan was issued in May 1991.

Plans and Activities:

The following activities, directed by LMB, are designed to ensure that the objectives of the ASP are met.

Quality Assurance

- Institution of a complexwide, uniform sampling and analysis quality assurance/quality control requirement.
- Implementation of an analylical laboratory performance evaluation program.
- Implementation of a sampling and analysis audit program.
- Implementation of a data quality objective process for sampling and analysis.

Analytical Support

- Publishing of compendia of standard sampling and analytical methods.
- Liaising with regulatory agencies on analytical requirements.
- Development of required analytical methods.
- Development of field screening methods.

Resource Planning and Sample and Data Management

- Determination of complex needs and capacity.
- Strategic planning for capacity development.
- Institution of regional and national sample management organizations.
- Implementation of a national data management system.

Funding*

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Validated Target Level	6.0	15.0	13.0	15.0	17.0	18.0	20.0

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Preliminary Unvalidated Case	6.0	15.0	17.0	20.4	23.0	21.0	21.0

* Actual funding may differ from planned funding as required by fiscal constraints and programmatic needs.

Title: International Technology Exchange (ITE).

Needs: To encourage collaboration and technology transfer within the international community, an international environmental technology transfer framework is being established. A key element of that framework is the determination of technical requirements or needs analysis to identify foreign technologies that may improve EM program effectiveness, reduce costs, or save time.

Objectives: The objective of the ITE Program is to establish an international technology transfer system that identifies foreign options for meeting technology needs in support of EM programs and establishing a mechanism for transferring technologies developed by DOE national laboratories, private industry, and universities to foreign markets.

Benefits: An international environmental technology information system and network will allow EM to assume leadership in defining and integrating international environmental technology transfer in the United States. The capability to access worldwide technology advances will facilitate the accomplishment of DOE's 30-year cleanup objectives and avoid unnecessary and costly development of technologies.

Accomplishments:

FY 1991

- Technology information is being collected.
- Preliminary planning, agenda, and U.S. papers have been identified.
- Future cooperation and long-term benefits will facilitate overcoming problems of Environmental Restoration and Waste Management.
- Preliminary planning/workshop requirements are being identified.
- Letter of invitation was sent to the United States/Japan Power Reactor and Nuclear Fuel Corporation (PNC). Draft itinerary and agenda were prepared.
- Arrangements (postponed from January 1991) have been made.

Plans and Activities:

FY 1991

- Demonstration of the partially loaded EnviroTRADE system (August 1991).
- United States/Soviet Union Vitrification Workshop (proposed August 1991 in Soviet Union).
- United States/Soviet Union Separations Workshop (proposed July 1991 in the United States).
- United States/Soviet Union Student/Scientist exchange (summer exchange of one student; 1-year exchange of senior scientist).
- United States/Soviet Union Modeling Workshop (proposed September in Soviet Union).
- PNC bilateral coordination meeting (June 1991).
- United States/Japan PNC Melter Workshop at Savannah River (July 1991).

Plans and Activities:

FY 1992

- Establish Interagency Task Force on International Technology Transfer.
- United States/Soviet Union bilateral workshops in areas of vitrification, modeling, and separations technologies.
- United States/Japan bilateral workshops in areas of HLW, TRU, D&D, and Waste Minimization and Volume Reduction.
- Integrated Demonstration with Germany (bioremediation and sensor technology in unsaturated zone).
- Establish United States Regional International Environmental Center(s) (proposed) and cooperate with centers in Germany, Netherlands, Hungary, and Japan.

FY 1993-1997

- Network EnviroTRADE/Environet to International Environmental Centers.
- Implement EnviroTRADE/Environet System.
- Initiate international Integrated Demonstrations in targeted technology areas.

Funding ($M)*	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
• Validated Target Level	0.5	3.0	2.7	3.0	4.0	5.0	6.0
• Preliminary Unvalidated Case	0.5	3.0	14.0	17.0	17.0	17.0	17.1

* Actual funding may differ from planned funding as required by fiscal constraints and programmatic needs.

Milestones

FY 1992

- Develop DOE/Office of Technology Development Environmental Technologies for Remedial Action Data Exchange (EnviroTRADE) information system.
- Establish regional center(s) for international technology transfer.
- Establish international information network.
- Identify mechanisms for transferring U.S. technologies to foreign sites.
- Identify mechanisms for transferring foreign technologies to U.S. sites.
- Initiate international technology transfer demonstration projects.

FY 1993-1997

- Implement EnviroTRADE information system.
- Implement international information network.
- Explore international options for EnviroTRADE data base administration.
- Significantly effect the rapid transfer of international technologies to meet worldwide needs through identified technology transfer mechanisms, including international demonstration projects.

Title: Decision Support (DS).

Needs: Within EM, decision makers must regularly make tradeoffs, often involving large sums of money and having profound technical, economic, social, and political consequences. Technology Development (TD) and its user community must make or review decisions involving program and project prioritization, health and environmental risk tradeoffs, cost and benefit tradeoffs to ensure the most effective expenditures of limited resources, and compliance with Federal, State, and local regulations and laws. DS will provide the basis for a risk-based approach to decision making, as well as the necessary tools, methods, and data bases to support early programmatic risk identification, assessment, analysis, and control.

Objectives: DS will enable DOE to identify, assess, analyze, and control programmatic risks associated with the development and execution of the TD Program. The objective of DS is to provide the framework for strategic and tactical decision making in TD. Within the context of that framework, DS will provide a means to better define the nature and magnitude of risk; a means to assess costs and benefits associated with reducing or otherwise mitigating risk; a clear understanding of the regulatory and legal performance standards that must be satisfied to achieve compliance; and an understanding of institutional issues, including "public acceptance" of new technology solutions. RM will support research and development of performance assessment and health risk analysis tools for risk-based decision making.

Benefits: The products and approaches developed in the DS Program will permit users to make more effective risk-based project and program management decisions. Budgeting and funding decisions will be founded on a risk-return basis. Program execution will be measured in terms of risk reduction, compliance, and the acceptance by the public and regulatory community of TD-developed technology solutions.

Accomplishments:

- Completed development of cost analysis and tradeoff methodology.
- Completed initial version of data base of environmental technologies.
- Completed prototype expert system to support the Remedial Investigation/Feasibility Study decision-making process.
- Enhanced methodology and criteria for evaluating TD's waste minimization projects.
- Completed initial evaluation process and criteria to support project evaluation within Integrated Demonstrations.

Plans and Activities:

- Develop strategic planning framework to define Office of Technology Development prioritization and evaluation requirements and participants in EM strategic planning process.
- Define analytical tools, data bases, and methods to support TD decision making.
- Develop cost analysis methodology for Research, Development, Demonstration, Testing, and Evaluation (RDDT&E) activities and conduct analysis of cost-effectiveness of emerging technologies.
- Develop data base of technologies for technology evaluation.
- Assist EM-40 in developing expert system to support Remedial Investigation/Feasibility Study RI/FS and technology selection decision making.
- Support research and development of performance assessment and health risk analysis tools for risk-based decision making.

Funding ($M)*	**FY 91**	**FY 92**	**FY 93**	**FY 94**	**FY 95**	**FY 96**	**FY 97**
• Validated Target Level	1.0	4.0	3.0	3.2	4.0	5.0	6.1
• Preliminary Unvalidated Case	1.0	4.0	5.0	4.5	3.0	3.0	3.0

* Actual funding may differ from planned funding as required by fiscal constraints and programmatic needs.

Milestones

FY 1991

- Develop strategic planning framework for TD.
- Establish risk-based evaluation criteria for IDs.
- Define tools, plans, methods, and data bases to support DS.

FY 1992

- Initiate application of selected risk-based management techniques.
- Complete development of TD prioritization methodology.
- Apply RDDT&E cost analysis capability to selected IDs.
- Define gaps and issues in performance assessment technology.

FY 1993-97

- Complete modification and adaptation of tools and capabilities for analyzing and managing technical, cost, and schedule risks.
- Develop performance assessment tools associated with emerging technologies.
- Complete modification and adaptation of capabilities for evaluating and managing institutional and regulatory risks.
- Complete evaluation of (health and environmental) risk assessment needs associated with emerging technologies and issue recommendations.
- Issue EM Integrated Decision Support Program Plan (jointly developed with other EM organizations).

Title: Robotics Technology Development (RTD).

Needs: Many environmental restoration and waste management activities involve work in hazardous environments and the handling of hazardous materials. When performed manually, this work exposes personnel to hazards and is slow and expensive. Robotics technologies will remove workers from hazardous environments, improve the productivity of remediation operations, and reduce the operating costs associated with EM operations. Robotics includes robots, servomanipulators, mobile platforms, and advanced automation equipment. Activities include advanced robots that make use of computer control based on sensor feedback. Computer technologies include graphics interfaces, real-time modeling and control data management, and shared human/computer control. Sensory inputs include force, proximity, vision, and navigation.

Objectives: The mission of Robotics Technology Development is to work with DOE sites to develop needs and requirements and to carry out Research, Development, Demonstration, Testing, and Evaluation (RDDT&E) in DOE laboratories and U.S. industry.

Benefits: Advanced robotics technologies will result in EM operations that are:

- Faster
  Programmed operations can be carried out more than an order of magnitude faster. Servo-controlled actions allow faster response to environmental conditions.
- Safer
  Computer models and sensor feedback can prevent inadvertent operator actions such as collisions with the environment.
- Cheaper
  Faster, more productive systems will result in quicker completion of remediation operations that reduce life cycle costs.

Accomplishments:

- Issued RTD Five-Year Plan.
- Initiated interactions with industrial and university robotics technology in workshop attended by more than 200 people.
- Demonstrated rapid, swing-free movement of simulated waste containers.
- Demonstrated scaled waste tank characterization and remediation, integrating sensors and advanced computers into a commercial robot.
- Demonstrated a teleoperated vehicle with advanced sensing technologies for mapping of buried waste sites.

- Demonstrated a robotics system for loading powder into a furnace in a plutonium production line.
- Demonstrated (at Hanford Site) the application of existing and emerging robotics technologies for the remediation of hazardous and radioactive wastes stored in underground storage tanks.
- Demonstrated (at Fernald Site) optical measurement technology for measurement of bentonite radon cap.
- Demonstrated (at Idaho National Engineering Laboratory) subsurface mapping, remote sizing, and hot spot retrieval for buried waste site characterization and remediation.
- Demonstrated simulated uranium and plutonium parts machining, processing and handling operations for minimization of waste generation.
- Demonstrated key standard laboratory modules for the Environmental Protection Agency Laboratory Protocols 3540 and 3550 for automation of contaminant analysis.
- Demonstrated advanced robot system control, environmental sensing, and advanced mechanical system in crosscutting and advanced technology program.
- Initiated university research program.

Plans and Activities:

Visits to DOE sites led to selection of six areas of need for robotics technology to support environmental restoration and waste management activities: (1) remediation of waste storatge tanks, (2) retrieval of buried wastes, (3) automation of contaminant analyses, (4) waste minimization, (5) decontamination and decommissioning, and (6) waste handling operations.

Plans for development and application of robotics technology are based on the needs listed above. In addition, the plans reflect regulatory compliance dates, planned remedial actions, and established schedules. The fundamental approach to developing robotics technology to meet these needs couples available and emerging technology with advanced technology. Near-term needs can be met by integrating available commercial technologies with emerging technologies. Development of advanced technology is proceeding to meet intermediate and long-term needs.

Funding ($M)*	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
• Validated Target Level	17.0	15.0	20.0	20.0	22.0	25.0	25.0
• Preliminary Unvalidated Case	17.0	15.0	20.0	20.0	25.0	25.0	25.0

* Actual funding may differ from planned funding as required by fiscal constraints and programmatic needs.

Section 3
Technology Integration

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Title: Technology Integration Program (TIP).

Needs: The needs of EM-52 are crosscutting the needs of the other groups within the Office of Technology Development (OTD). These needs include establishing mechanisms to facilitate the interaction with industry for the infusion, adoption, and diffusion of technology for the Integrated Demonstrations and encouraging and coordinating public participation efforts and regulatory issues to ensure that technical solutions fulfill socially acceptable and regulatory criteria.

Objectives: Objectives include facilitating coordination with industry by structuring a variety of outreach activities such as industry workshops. A central environmental industry resource will be developed to improve the identification of industry partners. Collaborative and contracting mechanisms will be reviewed to identify expedient methods of forming productive and beneficial relationships with industry. Public involvement issues will be addressed through close interaction with the Integrated Demonstration staff and field offices. Developing national-level linkages with private sector groups, universities, and stakeholders will be an essential part of this activity. Regulatory support requires the development of a regulatory streamlining strategy. To develop this strategy, an objective is to establish a Regulatory Issues Working Group.

Benefits: Successful Integrated Demonstrations require strong interaction with industry. The efforts to facilitate this interaction will contribute directly to the positive cooperation between industry and the Integrated Demonstration. Regulatory coordination and public participation issues are critical for the successful implementation of environmental technologies.

Accomplishments:

- Collaborated with National Center for Manufacturing Sciences to establish partnerships to address the needs of DOE and National Center for Manufacturing Sciences.
- Implemented South Carolina University Research and Education Foundation Program to develop regional technical assistance in environmental technology to medium and small businesses in South Carolina and Tennessee with Savannah River Laboratory and Oak Ridge National Laboratory, respectively.
- Fostered development of Environmental Cooperative Research and Development Agreements or Bioremediation and the use of Nuclear Energy's inorganic membrane technology.

- Organized three Barriers Subcommittees to address better ways for industrial participation including:
  - Streamlining of bureaucracy,
  - Consistency of operations, and
  - Intellectual property provisions.
- Initiated workshops with industry to identify needs of the private sector to match those of DOE (January 1991).
- Began assessment of industrial infrastructure for use as central information resource for industry interactions.
- Held successful workshop with mining industry with over 300 attendees to discuss how mining technology can be applied to environmental cleanup issues.
- Coordinated/collaborated with Chief Patent Counsel and Procurement Policies to establish mechanisms to expedite the technology integration process at the Headquarters and field level.
- Conducted quarterly management meetings to run program and provide network on technology integration activities, focusing on Integrated Demonstrations, among the DOE sites.

Funding ($M)*	**FY 91**	**FY 92**	**FY 93**	**FY 94**	**FY 95**	**FY 96**	**FY 97**
• Validated Target Level							
Education	38.0	27.8	40.0	45.0	50.0	54.0	60.0
Technical Integration	6.0	13.0	15.6	16.1	24.1	32.5	35.2
Total	44.0	40.0	55.6	61.1	74.1	86.5	95.2
• Preliminary Unvalidated Case							
Education	38.0	27.8	50.0	55.0	50.0	54.0	60.0
Technical Integration	6.0	13.0	35.5	33.7	41.7	40.5	37.5
Total	44.0	40.0	85.5	88.7	91.7	94.5	97.5

* Actual funding may differ from planned funding as required by fiscal constraints and programmatic needs.

Milestones

FY 1991

- Assess regulatory issues.
- Complete planning with NAWID for university participation in TIP.
- Hold initial workshop with industry to determine preferences for working with DOE.
- Develop Office of Technology Development liability strategy.
- Complete long-range public participation and regulatory strategy.
- Identify one site technology for maturation within CATD and another technology with EM potential at a second site.
- Shoot a television pilot film, *A Flash of Genius*.
- Collaborate with Ford Motor Company to define joint work statement.
- Conduct Environmental Technical Assistance Workshop at Oak Ridge for Tennessee State regulatory agents.
- Conduct Industry Planning Workshops.
- Laguna Demonstration: Select option with Laguna's management approval.
- Develop Industrial Integration Implementation Strategy (incorporate Infrastructure Assessment Findings and Options Analysis)—staff permitting.
- Hold Gordon-type Conference for Technology Selection and Evaluation (GE Environmental Research Center).
- Negotiate environmentally compliant manufacturing Cooperative Research and Development Agreement (CRADA) with National Center for Manufacturing Sciences.
- Hold Technology Integration Industrial Workshop.
- Meet with EPA, LANL, LLNL to investigate off-gas capture for thermal treatment processes.

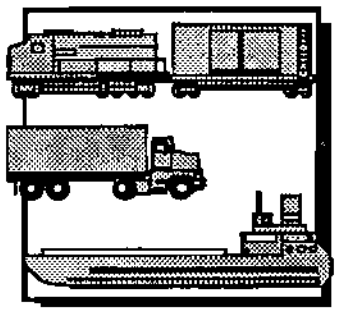
FY 1992

- Develop Technology Integration FY 1992 Management and Implementation Plan.
- Complete Industrial Infrastructure Assessment.
- Hold Quarterly TIP Management Meeting in Washington, D.C. area.
- Air television pilot, *A Flash of Genius* on Public Broadcasting System.
- Decide whether to implement Ames Model at INEL.
- Establish an environmental management CRADA and one inorganic membrane technology CRADA.

FY 1993-1997

- Implement "mini" demonstration of "third dimension of ID."
- VOC Destruction Program. Complete T&E of processes supplied by industrial partners solicited from CBD 1991 Notice.
- Sponsor Environmental Management Technology Transfer Fair.
- Establish second collaborative partnership with industry.
- Hold Technology Integration Workshop.

Section 3
Transportation Activities



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Title: Albuquerque Field Office

Activities: Albuquerque Field Office directly manages a transportation technology development program at Sandia National Laboratories for the development of nuclear and hazardous materials packaging and transportation systems. This research and development program consists of seven activity areas for developing technology to solve current and future transportation and packaging problems for DOE and for providing technical support on institutional and regulatory issues.

Regulatory Authorities, Drivers, and References:

- Title 10 CFR 71; NUREG-0360; Title 40 CFR 171-178; Title 40 CFR 260-265.
- DOE Orders 1540.1, 1540.2, 1540.3, 5610.1, 5480.2, 5480.3.
- International Atomic Energy Agency Safety Series No. 6 and related series publications.
- FY 1991 Transportation Management Program Plan.
- FY 1991 Transportation Management Plan Executive Summary.
- Albuquerque Field Office Monthly Reports - Transportation Management Plan Support.
- RADTRAN 4.0 User Guide, SAND89-2370, TTC-0943.

Accomplishments:

- Initiated hazardous and mixed waste packaging needs assessment.
- Initiated planning for a transportation environmental analysis document.
- Completed the mobile instrumentation system for radioactive materials packaging tests.

Plans and Activities:

- Develop improved engineering analysis methods to better predict the behavior of packaging under accident conditions.
- Perform transportation package testing for certification and develop and maintain testing and laboratory facilities to accommodate future designs.
- Develop advanced technology for new systems, components, and material for use by packaging designers.
- Develop and maintain state-of-the-art analysis skills and capabilities to support transportation package development and certification.
- Provide technical data to aid in resolution of regulatory transportation issues and support U.S. and international standards development and technology transfer.
- Provide safety and systems assessment, including radiological risk, logistic, and economic considerations as they affect and are affected by operational and institutional forces.
- Develop hazardous and mixed waste materials packaging technology.

Funding

Funding By Program
(Dollars in Thousands)

	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
DP	5,789	0	0	0	0	0	0
EM	0	7,660	8,426	9,269	10,195	11,215	12,337
TOTAL	5,789	7,660	8,426	9,269	10,195	11,215	12,337

Milestones

- Prepared scope of generic transportation risk document (3Q FY 1990).
- Complete MOSAIC cask drop tests (4Q FY 1991).
- Prepare brittle fracture capability report (1Q FY 1992).
- Complete Elastomeric Seal Test Data Compilation (3Q FY 1992).
- Prepare Hazardous and Mixed Waste Needs and Feasibility Report (1Q FY 1992).
- Make comprehensive routing model available on TRANSNET (2Q, Y 1992).
- Plan and support PATRAM '92 (1992, 1995, and continuing at 3-year intervals).
- Submit Elastic-Plastic Design Report (3Q FY 1992).
- Complete Impact Limiter Studies (4Q, FY 1992).
- Complete RADTRAN 5.0 Development (4Q FY 1992).
- Submit Rail Transport Data Report (FY 1993).
- Provide Domestic Support for N14 and Working Groups (continuing).
- Test prototype hazardous and mixed waste packages (FY 1995).
- Code Case - Elastic-Plastic Design (FY 1996).

Title: Chicago Field Office

Activities: Chicago Field Office provides support to the Transportation Management Program in the area of public information films. The major early use of the films was for training purposes. Use has been expanded to make the films available to State and local officials, students, civic groups, and other members of the public.

Regulatory Authorities, Drivers, and References:

- FY 1991 Transportation Management Program Plan.
- Transportation Management Program Management Summary.
- Chicago Field Office Monthly Reports - Transportation Management Program Support.

Accomplishments:

- Completed Emergency Response Public Information Film.

Plans and Activities:

- Film Distribution: The film "Transportation of Radioactive and Other Hazardous Materials" is being distributed through cable television and videotapes. Distribution contract has been extended 1 year.
- Public Information Films/Videos: A library of short (30- to 60-minute) excerpts will be produced to support shipping cask demonstration and information for the public media. Outyear plans include the development of additional films and videos.
- Emergency Response Public Information Film: Film will show the response required by emergency workers for a radioactive transport accident. Film is in third draft of script, and production will be within 30 days after final approval.
- Children's Videotapes: This film will provide grade school children with very basic information regarding transportation of hazardous and radioactive materials.

Funding

Funding By Program
(Dollars in Thousands)

	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
DP	205	0	0	0	0	0	0
EM	0	205	226	248	273	300	330
TOTAL	205	205	226	248	273	300	330

Milestones

- Completed Emergency Response Public Information Film.
- Complete Children's Videotapes (FY 1991-FY 1994).
- Continue Film Distribution through Modern Talking Pictures.

Title: Nevada Field Office

Activities: Nevada Field Office provides support to the Transportation Management Program in the area of emergency preparedness.

Regulatory Authorities, Drivers, and References:

- FY 1991 Transportation Management Program Plan.
- Transportation Management Program Management Summary.
- Nevada Field Office Monthly Reports - Transportation Management Program Support.

Plans and Activities:

- Provide advice and assistance to the Transportation Emergency Preparedness Program (TEPP): TEPP Steering Group involvement includes assistance in the treatment and resolution of relevant transportation emergency preparedness and response issues.
- Review TEPP-Related Documents: Numerous documents related to emergency management must be reviewed for relevance to and implications for TEPP.
- Assist in Training, Exercise, etc.: A variety of training, exercises, field assistance, and readiness assurance audit activities require assistance, technical advice, and follow-up.

Funding

Funding By Program
(Dollars in Thousands)

	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
DP	250	0	0	0	0	0	0
EM	0	300	330	363	399	439	483
TOTAL	250	300	330	363	399	439	483

Milestones

- Provide advice and assistance to the Transportation Emergency Preparedness Program.
- Review TEPP-related documents and provide requested reports.
- Assist in training, exercise, and other readiness assurance activities.

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Title: Oak Ridge Field Office

Activities: Oak Ridge Field Office supports the Transportation Logistics Program, the Institutional Programs, Emergency Response Program, and the Information and Communications Programs conducted by the Transportation Management Program.

Regulatory Authorities, Drivers, and References:

- Title 10 CFR 71; Title 29 CFR 1910; Title 40 CFR 260-265, 761; Title 49 CFR 171-179.
- DOE Orders 1540.1, 1540.2, 1540.3, 5610.1, 5480.3, 5480.4, 5480.11, 5632.1, 5632.2A.
- International Atomic Energy Agency Safety Series No. 6 and related series publication.
- FY 1991 Transportation Management Program Plan.
- Transportation Management Program Management Summary.
- Oak Ridge Field Office Monthly Reports - Transportation Management Program Support.

Accomplishments:

- Conducted 24 regulatory compliance workshops with 1,178 participants and 10 emergency response orientation workshops with 383 participants in FY 1990 under DOE-sponsored training program on transportation of radioactive and hazardous materials. There were 29 regulatory compliance workshops with 1,160 participants and 13 emergency response workshops with 416 participants in FY 1991.
- Upgraded TRANSCOM, a two-way tracking system to use an automatic satellite position-reporting system in December 1990.

Plans and Activities:

- Manage regulatory compliance training programs and emergency response workshops.
- Develop information and communications products including films, videotapes, booklets and brochures, exhibits, etc.
- Manage operation and maintenance of Transportation Management Program operational data bases (e.g., Shipment Mobility/Accountability System).
- Maintain DOE's shipment tracking system (TRANSCOM).

Funding

Funding By Program
(Dollars in Thousands)

	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
DP	3,395	0	0	0	0	0	0
EM	0	4,970	5,467	6,014	6,615	7,277	8,004
TOTAL	3,395	4,970	5,467	6,014	6,615	7,277	8,004

Milestones

- Produce Five-Year Plan for Information and Communications Program (completed).
- Install dedicated Transportation Management Program computer and transfer SMAC data base (completed).
- Establish a mobile information and communications exhibit (FY 1993).
- Establish a program to develop professional Transportation Managers for DOE (FY 1993).
- Revise the full-size transportation exhibit (FY 1996).
- Provide assistance to Transportation Management Program in developing an Automated Transportation Management System (FY 1995).
- Conduct 38 regulatory compliance workshops and 10 emergency response orientation workshops annually in years FY 1992-1997.

Title: Richland Field Office

Activities: Richland Field Office supports the Transportation Logistics Program and outreach activities conducted by DOE's Transportation Management Program. This support includes analyzing and developing transportation policies and procedures; developing and implementing operational systems and data bases; performing economic analysis of transportation activities; conducting training programs; providing technical expertise for DOE's oversight control system for explosive classification activities, packaging operations, and transportation logistics management; and performing institutional program development and outreach activities.

Regulatory Authorities, Drivers and References:

- Title 10 CFR 71; Title 29 CFR 1910; Title 40 CFR 260-265, 761; Title 49 CFR 171-179.
- DOE Orders 1540.1, 1540.2, 1540.3, 5610.1, 5480.3, 5480.4, 5480.11, 5632.1, 5632.2A.
- International Atomic Energy Agency Safety Series No. 6 and related series publications.
- FY 1991 Transportation Management Program Plan.
- Transportation Management Program Management Summary.
- Richland Field Office Monthly Reports - Transportation Management Program Support.

Accomplishments:

- Implemented the Motor Carrier Evaluation Program.
- Prepared Department of Transportation 7A packaging guides.
- Completed the Cask Model Mockup.

Plans and Activities:

- Analyze and develop transportation policies and procedures.
- Develop operations technology, including the Automated Transportation Management System.
- Perform economic analysis of transportation activities.
- Conduct specific transportation training programs.
- Evaluate packaging operations and transporter interface.
- Perform regulatory and standards analysis maintenance.
- Provide technical expertise for DOE's oversight control system (audits, appraisal support) for explosive classification activities, packaging operations, and transportation logistics management.
- Perform institutional program development and outreach activities.

Funding:

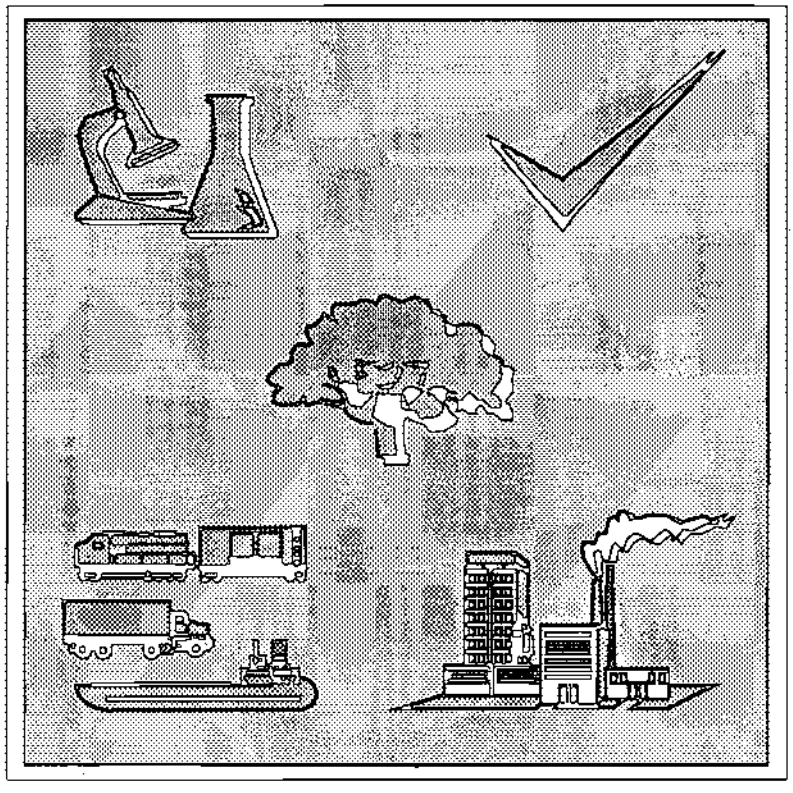
Funding By Program
(Dollars in Thousands)

	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
DP	3,585	0	0	0	0	0	0
EM	0	3,835	4,219	4,640	5,104	5,615	6,176
TOTAL	3,585	3,835	4,219	4,640	5,104	5,615	6,176

Milestones

- Implement the Motor Carrier Evaluation Program (completed).
- Implement Automated Transportation Management System (ATMS) pilot project (FY 1991).
- Prepare Department of Transportation 7A packaging guides (completed).
- Prepare 181 performance-oriented packaging resource guides (completed).
- Conduct nine training workshops (FY 1991).

Appendices



APPENDIX A

DEPARTMENT OF ENERGY INSTALLATIONS

SITES/FACILITIES WHERE ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT ACTIVITIES ARE BEING CONDUCTED

	Installation	Location
ALBUQUERQUE	Inhalation Toxicology Research Institute	Albuquerque, NM
	Kansas City Plant	Kansas City, MO
	Los Alamos National Laboratory	Los Alamos, NM
	Mound Plant	Miamisburg, OH
	Pantex Plant	Amarillo, TX
	Pinellas Plant	St. Petersburg, FL
	Sandia National Laboratories - Albuquerque	Albuquerque, NM
	Sandia National Laboratories - Livermore	Livermore, CA
	South Valley Site	Albuquerque, NM
	Waste Isolation Pilot Plant	Carlsbad, NM
CHICAGO	Ames Laboratory	Ames, IA
	Argonne National Laboratory - East	Chicago, IL
	Argonne National Laboratory - West	Idaho Falls, ID
	Battelle Columbus Laboratories	Columbus, OH
	Brookhaven National Laboratory	Upton, LI, NY
	Fermi National Accelerator Laboratory	Chicago, IL
	Hallam Nuclear Power Facility	Lincoln, NE
	New Brunswick Laboratory	New Brunswick, NJ
	Piqua Nuclear Power Facility	Piqua, OH
	Princeton Plasma Physics Laboratory	Princeton, NJ
IDAHO	Component Development & Integration Facility	Butte, MT
	Grand Junction Projects Office	Grand Junction, CO
	Idaho Chemical Processing Plant	Idaho Falls, ID
	Idaho National Engineering Laboratory	Idaho Falls, ID
	West Valley Demonstration Project	West Valley, NY
NEVADA	Nevada Test Site	Las Vegas, NV
OAK RIDGE	Feed Materials Production Center	Fernald, OH
	Niagara Falls Storage Site	Niagara Falls, NY
	Oak Ridge K-25 Site	Oak Ridge, TN
	Oak Ridge National Laboratory	Oak Ridge, TN
	Oak Ridge Y-12 Plant	Oak Ridge, TN
	Paducah Gaseous Diffusion Plant	Paducah, KY
	Portsmouth Gaseous Diffusion Plant	Portsmouth, OH
	Weldon Spring Site Remedial Action Project	St. Louis, MO
RICHLAND	Hanford Reservation	Richland, WA

APPENDIX A (Continued)

	Installation (Continued)	Location
ROCKY FLATS	Rocky Flats	Denver, CO
SAN FRANCISCO	Atomics International	Canoga Park, CA
	General Atomics	San Diego, CA
	General Electric Vallecitos Nuclear Center	Vallecitos, CA
	Laboratory for Energy-Related Health Research	Davis, CA
	Lawrence Berkeley Laboratory	Berkeley, CA
	Lawrence Livermore Laboratory	Livermore, CA
	Energy Technology Engineering Center	Santa Susana, CA
	Stanford Linear Accelerator Center	Palo Alto, CA
SAVANNAH RIVER	Savannah River Site	Aiken, SC

FUSRAP Sites

	Installation	Location
	Albany Metallurgical Research Center	Albany, OR
	University of California*	Berkeley, CA
	Acid/Pueblo Canyon*	Los Alamos, NM
	Bayo Canyon*	Los Alamos, CA
	Chupadera Mesa	White Sands Missile Range, NM
	Hazelwood (Latty Avenue), MO	Hazelwood, MO
	St. Louis Airport Storage Site	St. Louis, MO
	St. Louis Airport Storage Site Vicinity Properties	St. Louis, MO
	Mallinckrodt, Inc.	St. Louis, MO
	University of Chicago*	Chicago, IL
	National Guard Armory	Chicago, IL
	General Motors	Adrian, MI
	Niagara Falls Storage Site Vicinity Properties	Lewiston, NY
	Ashland Oil Co. #1	Tonawanda, NY
	Ashland Oil Co. #2	Tonawanda, NY
	Seaway Industrial Park	Tonawanda, NY
	Linde Air Products	Tonawanda, NY
	Universal Cyclops	Aliquippa, PA
	W. R. Grace & Co.	Curtis Bay, MD
	Middlesex Landfill	Middlesex, NJ
	Middlesex Sampling Plant	Middlesex, NJ

* Completed

FUSRAP Sites (Continued)

Installation	Location
Du Pont & Company	Deepwater, NJ
Maywood	Maywood, NJ
Kellex/Pierpont*	Jersey City, NJ
Wayne/Pequannock, NJ	Wayne/Pequannock, NJ
Colonia, NJ	Colonia, NJ
Seymour Specialty Wire	Seymour, CT
Shpack Landfill	Norton, MA
Ventron, Beverly, MA	Beverly, MA

* Completed

Other Sites

Installation	Location
Ross Aviation	Albuquerque, NM
Tonopah Test Range	Nellis Air Force Base, NV
Johnston Atoll	Johnston Atoll
Amchitka Island	Amchitka Island, AK
Project GNOME Site	Carlsbad, NM
Project Shoal Site	Fallon, NV
Tatum Dome	Tatum Dome, MS
Project GASSBUGGY Site	Farmington, MN
Central Nevada Test Area	Central Nevada Test Area, NV
Project Rulison Site	Grand Valley, CO
Project RioBlanco Site	Rifle, CO
Reactive Metals Inc.	Ashtabula, OH
Center for Energy and Environmental Research	Mayaguez, PR
Kauai Test Facility	Kauai, HI
Maxey Flats	Maxey Flats, KY

UMTRA Sites

Lakeview, OR	Lowman, ID
Salt Lake City, UT	Green River, UT
Mexican Hat, UT	Grand Junction, CO
Naturita, CO	Slickrock, CO
Durango, CO	Gunnison, CO

UMTRA Sites (Continued)

Rifle, CO
Monument, AZ
Ambrosia Lake, NM
Shiprock, MN
Riverton, WY
Spook, WY
Bowman, ND
Belfield, ND
Edgemont, SD
Falls City, TX
Canonsburg, PA
Maybell, CO
Tuba City, AZ

APPENDIX B

LIST OF AGREEMENTS

STATUS OF AGREEMENTS-IN-PRINCIPLE WITH STATES*

State	Facilities Covered Under Agreement	Status of Negotiations	Completion Date**
CA	Lawrence Livermore National Lab. Lawrence Berkeley Lab. Stanford Linear Accelerator Center Energy Technology Engineering Center Lab. for Energy-Related Health Research Sandia National Lab. at Livermore	Completed	9/6/90
CO	Rocky Flats Office	Completed	6/28/89
FL	Pinellas Plant	Completed	9/20/90
IL	Argonne National Lab. Fermi National Accelerator Lab. Palos Forest Preserve Site	Under negotiation	Summer 1991
ID	Idaho National Engineering Lab.	Completed	5/21/90
KY	Paducah Gaseous Diffusion Plant	Completed	5/13/91
MO	N/A	State declined AIP	N/A
MS	Tatum Dome	Completed	1/28/91
NM	Sandia National Lab. Los Alamos National Lab. Waste Isolation Pilot Plant Inhalation Toxicology Research Institute	Completed	10/22/90
NV	Nevada Test Site Tonopah Test Range	Completed	10/4/90
OH	Battelle Columbus Lab. Feed Materials Production Center, Fernald Portsmouth Gaseous Diffusion Plant Mound Lab. RMI - Ashtabula	Under negotiation	Summer 1991
SC	Savannah River Site	Under negotiation	Summer 1991
TN	Oak Ridge Reservation	AIP under final review; at State's request, to be executed concurrently with separate health study and CERCLA/RCRA agreement	5/13/91

APPENDIX B (Continued)

State	Facilities Covered Under Agreement	Status of Negotiations	Completion Date**
TX	Pantex	Completed	7/31/90
WA	Hanford Reservation	Oversight and monitoring covered under Tri-Party Agreement with State and EPA; separate AIP has not been developed	N/A

* The Agreements-in-Principle (AIPs) have been or are being developed with States that host DOE nuclear facilities to (1) allow the States access to the DOE facilities; (2) support State oversight of DOE environmental monitoring programs and independent monitoring as necessary to validate DOE data; and (3) support State planning for response to onsite emergencies.

** A total of 10 Agreements-in-Principle have been finalized to date.

OFFICE OF ENVIRONMENTAL COMPLIANCE
STATUS OF FEDERAL AND STATE AGREEMENTS*

Facility	Parties	Statute(s)	Date Executed
Savannah River Site	DOE/South Carolina	CAA	2/27/79
Oak Ridge Y-12 Plant	DOE/EPA	CAA	4/14/82
Savannah River Site	DOE/South Carolina	CWA	1/3/84
Savannah River Site	DOE/South Carolina	SDWA	11/28/84
Oak Ridge Y-12 Plant	DOE/EPA	CWA	4/17/85
Savannah River Site	DOE/South Carolina	SDWA	6/12/85
Savannah River Site	DOE/South Carolina	RCRA	7/19/85
Kansas City Plant	DOE/EPA	CERCLA	9/30/85
Savannah River Site	DOE/South Carolina	RCRA	11/7/85
Oak Ridge National Laboratory	DOE/EPA	CWA	2/12/86
Savannah River Site	DOE/South Carolina	CWA	6/20/86
Feed Materials Production Center	DOE/EPA	CERCLA/RCRA/CAA	7/19/86
Rocky Flats Office	DOE/EPA/Colorado	CERCLA/RCRA	7/31/86
Weldon Spring Site	DOE/EPA	CERCLA/NEPA	8/22/86
Portsmouth Gaseous Diffusion Plant	DOE/EPA	RCRA	9/30/86
Hanford	DOE/Washington	RCRA	10/1/86
Savannah River Site	DOE/South Carolina	RCRA	10/6/86
Savannah River Site	DOE/South Carolina	CWA	10/6/86
Savannah River Site	DOE/EPA	CWA	1/23/87
Lawrence Livermore National Lab	DOE/EPA	TSCA	3/19/87
Savannah River Site	DOE/South Carolina	RCRA	5/1/87
Idaho National Engineering Lab	DOE/EPA	RCRA	7/10/87
Savannah River Site	DOE/EPA	RCRA	7/30/87
Savannah River Site	DOE/South Carolina	CAA	9/4/87
Brookhaven National Lab	DOE/EPA	TSCA	9/4/87

APPENDIX B (Continued)

Facility	Parties	Statute(s)	Date Executed
Savannah River Site	DOE/South Carolina	SDWA	9/9/87
Lawrence Livermore National Lab (Site 300)	DOE/California	CA St. Hazardous Waste Law	9/25/87
Paducah Gaseous Diffusion Plant	DOE/Kentucky	CWA	9/28/87
Savannah River Site	DOE/South Carolina	SDWA	10/7/87
Savannah River Site	DOE/South Carolina	RCRA	11/12/87
Savannah River Site	DOE/South Carolina	RCRA	11/12/87
Savannah River Site	DOE/South Carolina	RCRA	12/29/87
Western Area Power Administration	DOE/EPA	RCRA	12/30/87
Naval Petroleum Reserves - California	DOE/EPA	CAA	2/4/88
Great Plains Gasification Plant	DOE/EPA/North Dakota	CAA	3/25/88
Lawrence Livermore National Lab	DOE/EPA/California	CERCLA	11/1/88
Paducah Gaseous Diffusion Plant	DOE/EPA	CERCLA	11/4/88
Savannah River Site	DOE/South Carolina	RCRA	11/23/88
Monticello Mill Site/Vicinity Properties	DOE/EPA/Utah	CERCLA	12/22/88
Los Alamos National Lab	DOE/EPA	CWA	2/13/89
Savannah River Site	DOE/South Carolina	RCRA	2/16/89
Hanford Site	DOE/EPA/Washington	CERCLA/RCRA	5/15/89
Kansas City Plant	DOE/EPA	RCRA	6/23/89
Rocky Flats Office	DOE/Colorado	RCRA	7/14/89
Rocky Flats Office	DOE/EPA/Colorado	RCRA	9/19/89
Portsmouth Gaseous Diffusion Plant	DOE/EPA	RCRA/CERCLA	9/27/89
Rocky Flats Office	DOE/State	RCRA	11/3/89
Savannah River Plant	DOE/State	RCRA	12/12/89
SNLA	DOE/State	RCRA	12/29/89
Savannah River Plant	DOE/State	CWA	2/27/90

Facility	Parties	Statute(s)	Date Executed
Hanford Site	DOE/EPA	TSCA	3/27/90
Feed Materials Production Center	DOE/EPA	CERCLA	6/29/90
Bonneville (Ross Complex)	DOE/EPA	CERCLA	5/1/90
Savannah River Site	DOE/State	CWA	6/5/90
St. Louis Airport Sites	DOE/EPA	CERCLA	6/26/90
Mound Plant	DOE/EPA	CERCLA	8/6/90
Savannah River Site	DOE/State	RCRA	9/5/90
Pantex Plant, TX	DOE/EPA	RCRA	12/10/90
Rocky Flats Office, CO	DOE/EPA/Colorado	CERCLA	1/22/91
Savannah River Site, SC	DOE/EPA	RCRA	3/13/91
W. R. Grace (Wayne), NJ	DOE/EPA	CERCLA	4/22/91
Maywood, NJ	DOE/EPA	CERCLA	4/22/91
Rocky Flats Office	DOE/EPA	RCRA	5/10/91

* Total of 64 agreements (agreements include Federal Facility Compliance Agreements, Federal Facilities Agreements, Settlement Agreements, and Consent Orders).

APPENDIX B (Continued)

EH-22 TRACKING SYSTEM FOR ONGOING NEGOTIATIONS
FOR COMPLIANCE AGREEMENTS

Facility	Statute/Type	Activity	Parties	Status
AL				
Mound	RCRA Consent Order	Cleanup	DOE/OH	Negotiations in progress
Pantex	RCRA 3004(u) Permit	Cleanup	DOE/EPA/TX	Negotiations in progress
RF				
RF	CAA/NESHAPs	Compliance	DOE/EPA	Preliminary discussions
RF	State Air Law (APENs) FFCA	Compliance	DOE/CO	Negotiations in progress
RF	RCRA (Residues) Consent Order	Compliance	DOE/CO	Preliminary discussions
CH				
BNL	CERCLA/RCRA IAG	Cleanup	DOE/EPA/NY	In final HQ approval process
ID				
INEL	CERCLA/RCRA IAG	Cleanup	DOE/EPA/ID	Negotiations focusing on final issues
INEL	RCRA Consent Order	Compliance	DOE/ID	Negotiations focusing on final issues
INEL	RCRA (LDR) FFCA	Compliance	DOE/EPA/ID	Preliminary discussions
INEL	RCRA/Air/Water Consent Orders	Compliance	DOE/ID	Preliminary discussions
West Valley	RCRA Consent Order	Cleanup	DOE/EPA/NY	Negotiations in progress
West Valley	RCRA FFCA	Compliance	DOE/EPA/NY	Negotiations in progress
OR				
FMPC	CAA (NESHAPs) FFCA	Compliance	DOE/EPA	Negotiations focusing on final issues
Weldon Spring Site	CERCLA IAG	Cleanup	DOE/EPA	In final HQ approval process

Facility	Statute/Type	Activity	Parties	Status
Paducah	RCRA 3004(u) Permit	Cleanup	DOE/EPA/KY	Negotiations in progress
Paducah Portsmouth Oak Ridge K-25 Site	TSCA FFCA	Compliance	DOE/EPA	Negotiations focusing on final issues
ORR	RCRA (LDR) FFCA	Compliance	DOE/EPA	Preliminary discussions
ORR	CERCLA IAG	Cleanup	DOE/EPA/TN	In final HQ approval process
ORR	TSCA FFCA	Compliance	DOE/EPA	Preliminary discussions
ORR	CAA (NESHAPs)	Compliance	DOE/EPA	Preliminary discussions
SAN				
LLNL-Site 300	CERCLA IAG	Cleanup	DOE/EPA/CA	Negotiations in progress
SR				
SRS	CERCLA/IAG	Cleanup	DOE/EPA/SC	In final HQ approval process
SRS	RCRA (solvent-laden rags)	Compliance	DOE/SC	Negotiations in progress
SRS	RCRA (Part B Permit)	Compliance	DOE/SC	Negotiations in progress
SRS	State Clean Water Act (NPDES Mercury Violation)	Compliance	DOE/SC	In final HQ approval process

APPENDIX C

COMMENTS ON

FY 1992-1996 FIVE-YEAR PLAN

COMMENTS ON FY 1992-1996 FIVE-YEAR PLAN

OFFICE OF ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT

GENERAL COMMENTS

COMMENT: Throughout the Plan there is mention of a "30-year goal" for cleanup. This might be better stated as cleanup by some specific date rather than a 30-year goal. A 30-year goal in 1990 is 2020. The same 30-year goal in 1991 becomes 2021.
RESPONSE: DOE has established a cleanup goal of 2019. Use of a 30-year goal for cleanup has been routinely employed by planners and policy analysts for long-range activities. DOE has selected planning, implementation, and completion of environmental restoration activities. Given the magnitude, complexities, and uncertainties associated with DOE activities, an exact terminal date for achieving total cleanup at all DOE installations cannot be specified.

COMMENT: Your comment regarding the danger of focusing on short-term goals rather than long-term solutions is very important. A critical part of recognizing possible alternatives and achieving solutions is to adequately define the problems. Much can be accomplished using available data, but many of the sites are so poorly characterized that cleanup activities may be ineffective, inappropriate technologies may be applied, and even the degree of health risk or environmental degradation is difficult to assess. The Falls City, Texas, UMTRA site is an example where studies to more adequately characterize the site have now begun. Even in the preliminary stages the characterization work has suggested areas where mill tailings can be relocated and is beginning to indicate some approaches to effective remediation. Without characterization, it is possible that a quick fix may "stabilize" a uranium mill tailings site to meet a milestone, but it may not be recognized that improperly relocated tailings could create a point of focused recharge that could exacerbate the groundwater contamination. Characterization, better problem definition, and establishing an adequate data base are essential if DOE is to assess the current conditions, evaluate the health and environmental risks, prioritize activities and budgets, and apply the best remediation technologies.
RESPONSE: DOE is working with State and Federal agencies and other interested parties to achieve the most appropriate remedial activity at the Falls City, Texas, Uranium Mill Tailings Remedial Actions (UMTRA) site. As part of this commitment, DOE is attempting to comply with schedules and performance requirements established under the Federal Facilities Agreement (FFA). DOE is extending every effort to perform characterization and analysis investigations, environmental assessments (EA), health and environmental risk assessments, and budgetary considerations necessary to fully characterize the UMTRA site problems. Onsite investigations are expected to provide information necessary to support virtually every aspect of the environmental problem.
DOE is committed to providing permanent, rather than short-lived solutions to its problems. In order to apply the best available remediation technology, DOE has made providing funds for timely research and development a high priority.

COMMENT: DOE has not requested sufficient funds to accomplish all the activities in the plan. Is DOE unwilling to ask for the needed funding?
RESPONSE: Availability of funds to support environmental remediation and other activities at DOE installations is based upon a complex interaction between congressional appropriations and competing programmatic needs. The proposed funding estimates, based on DOE experience in program management and environmental restoration activities, will be employed as a guide for long-range planning purposes. Some of the realities that require a dynamic approach to estimating the amount of monetary support required for environmental cleanup include inflation, changes in regulatory requirements, and competition for future funding.
EM is developing a priority system to support

the allocation of funds to activities with greater needs. These priorities are (1) activities necessary to prevent near-term adverse impacts to workers, the public, or the environment; (2) activities necessary to meet the terms of agreements that exist or are being negotiated; (3) activities to reduce outyear risks and costs and comply with external environmental laws; and (4) activities intended to increase the pace of work or accelerate overall compliance. DOE is informing the States, EPA, and Congress of cost estimates identified by field offices and is working to plan and conduct cost-effective programs. Benefiting from lessons learned by other Federal agencies, DOE intends to expend funds only when a clearly achievable work plan has been established. DOE meets regularly with the States, Congress, and other agencies to review plans and progress, solicit suggestions, and listen to comments.

COMMENT: The public should be told DOE and NRC have been discussing the redefinition of high-level waste behind closed doors for nearly a year, not even informing members of the Tri-Party Agreement. Nowhere does DOE mention the attempt to redefine huge quantities of waste so they would be beyond the scope of NRC licensing. Waste hazards should not be downgraded or underestimated to reduce cleanup costs.
RESPONSE: DOE and the Nuclear Regulatory Commission (NRC) maintain a continuing level of discussion and professional interaction on common issues of national concern. These interagency discussions are on record at both the DOE and NRC public information/reading rooms. Both agencies encourage public involvement and participation in many areas of nuclear waste management.
Complex and technically demanding issues, such as defining high-level waste, are typically developed at the staff level before publication of the Notice of Intent for public comment. As part of the assessment process, DOE and NRC routinely solicit public response to proposed activities. The public will be invited to respond before any redefinition of high-level waste is undertaken.

COMMENT: Companies that generated the wastes should not be allowed to profit from their cleanup. Is this in the plan?
RESPONSE: DOE agrees that it is unacceptable for a contributor of waste to profit by cleaning it up. DOE has taken an even stronger approach: A contributor of waste will not be able to manage others that are employed to clean up the waste. This approach will be implemented at certain locations throughout the DOE complex on a trial basis before it is considered for full implementation. A nationwide information-gathering meeting has been held to inform and to solicit information from potential industrial participants.

COMMENT: I have a concern about the reactors we would sell to other countries, but we get the waste back.
RESPONSE: The Nuclear Non-Proliferation Act of 1978 established a system that involves DOE, the Department of State, NRC, and the Arms Control and Disarmament Agency in any export of material, machinery, and/or technology from the United States that would provide other countries with the capability to produce electricity by means of nuclear power. This system includes export licensing by NRC under regulations in 10 CFR Part 110, "Export and Import of Nuclear Equipment and Material." The system safeguards every aspect of the nuclear fuel cycle, including waste management. Any waste that would be returned to the United States would be managed within the strict controls and export regulations established by these agencies to allow exportation of such materials and technology.

COMMENT: The way to fix the whole issue is to restore the ERDA.
RESPONSE: Restoration of the Energy Research Development Administration (ERDA) as a surrogate for DOE may afford few benefits for environmental restoration activities. ERDA was created in an attempt to segregate nuclear energy production operations from nuclear regulatory responsibilities. The scope and mission of

ERDA were more restrictive than DOE's and were reflected in its status below the cabinet level. Elevation of DOE to a presidential-level cabinet position has increased the authority of the department and expanded its role in the development and implementation of all matters related to energy production, energy conservation, public health and safety, and environmental concern.

COMMENT: DOE should not pay one additional dime to contractors until it institutes an acceptable payment in lieu of tax. Any portions of contractor incentives lost due to sub-performance should revert to the host community paying the burden for millions of dollars of negative national news coverage.
RESPONSE: As a Federal agency, DOE is prevented by Federal procurement regulations from distributing public funds in the form of "unawarded fees" to local communities. Unawarded portions of contractors fees must be returned to the national treasury. Although it is not within the authority or discretion of DOE to reallocate award fees to local communities, DOE does provide grants to communities under different circumstances.

COMMENT: The budget numbers are woefully inadequate, as much as $2 billion short nationwide, $250 million short at Hanford. The DOE indicated if the money isn't adequate, they'd go back and renegotiate the milestones. This is not the way to begin a 30-year agreement. If you must submit a supplementary request to Congress, do it. If money within DOE budget is not adequate, there are numerous projects within DOE that could be deferred [reorder priorities to put Hanford cleanup first].
RESPONSE: DOE is responsible for environmental restoration at all of its facilities. It determines the most effective use of available funds consistent with national policies, regulatory requirements, and agreements with other agencies and States. Those facilities with the most pressing needs, based on DOE's priority system, will receive commensurate levels of funds.

COMMENT: The plan says all the right things, but it will be meaningful only if DOE agrees to comply with all Federal and State environmental standards as required by S. 1140, and DOE seeks the funding from Congress needed to cleanup the Nation's weapons wastes. In opposing S. 1462, the DOE claims it needs flexibility to carry out the cleanup, but we think it is the flexibility that has led us to where we are today. We need to limit the DOE's flexibility. We urge DOE-RL to take this message back.
RESPONSE: DOE is committed to meet all appropriate Federal and State requirements and agreements for environmental restoration at its many and varied facilities. The uncertainties associated with congressional funding mandate that the Department maintain the maximum flexibility in allocation of available resources. Without flexibility, DOE would not have the capability to respond successfully to regulatory changes and unanticipated requirements.

COMMENT: I spoke with the DOE troubleshooter who said Rocky Flats is the worst place in the country with the problems they have as far as public relations, lying to the public, and violating safety practices. A month ago they found 50 pounds of plutonium in the heating ducts. What is the DOE doing talking about reopening it when there's so much to clean up. I don't know why we're even discussing reopening Rocky Flats, the worst place in the country. We're out of the cold war. We're talking about misplaced priorities. Let's put that money into something else. I know it maybe doesn't have to do with Hanford, except let's put that money here, not there.
RESPONSE: The allocation of funds for other DOE installations is based upon the national priorities established by Congress, regulatory agencies, and the public. The decision to undertake specific cleanup activities is the result of an analytical process that attempts to assess the risks to human health and the environment. Actions that reduce potential risks are considered a high priority within DOE and often take precedent over activities that do not present comparable levels of risk.

COMMENT: Why are they planning to open Rocky Flats: Is there a reason? A good one?
RESPONSE: Rocky Flats (RF) is a unique facility within the DOE complex. Many of the processes and operations at RF are duplicated at no other DOE site. Construction and renovation of buildings at other sites, equipment relocation, and application for environmental permits are expected to be lengthy and complicated processes. Reopening RF may prove to be the most prudent, and timely approach to stabilizing the Nation's supply of critical materials.

COMMENT: The funding process is too slow to react to imminent situations that need immediate attention. Essentially, this means that it would be necessary to provide a contingency account or to not correct the situation until the funding process has cycled through its 2-year course.
RESPONSE: DOE recognizes that unplanned situations may arise that require immediate response, and the Department routinely performs planning and response exercises. The Department has prepositioned resources in critical locations to provide immediate response capabilities. Funds are arrayed among many different levels within DOE as a contingency for rapid response to imminent situations. As currently defined in the proposed Environmental Restoration Prioritization System, emergency activities have the following conditions: (1) evidence suggesting that contaminant concentrations exist in environmental media at levels sufficient to warrant significant concern for potential human exposure; (2) populations with the potential for exposure; (3) evidence that exposures have occurred, are occurring, or are likely to occur before or within the year in question; and (4) estimated exposures at levels that could cause significant adverse health effects to some segments of the population.

PUBLIC INVOLVEMENT

COMMENT: On behalf of the Natural Resources Defense Council (NRDC), I am presenting the following brief comment on the 1990 Environmental Restoration and Waste Management Five-Year Plan (July 1990). As your files should show, NRDC submitted extensive comments on the 1989 Five-Year Plan. Because those comments were largely ignored, we have decided not to prepare similar comments on the 1990 Five-Year Plan. If the Department of Energy provides a meaningful response to our 1989 comments, most of which are still relevant, we will consider submitting comments on future Five-Year Plans.
Secretary Watkins has urged a new culture of openness and public responsiveness in DOE. Ignoring public comments and engaging in meaningless "public participation," do not promote this new culture.
RESPONSE: It is the position of DOE to support and foster public participation in the Environmental Restoration and Waste Management Five-Year Plan process. As part of this process, DOE has attempted to respond to the public comments. Given the volume and diversity of comments to the last Five-Year Plan, DOE has chosen to respond by grouping pertinent inquiries within the context of general issues. This strategy provides the most effective means of conveying DOE response in the most timely and cost-effective manner.

COMMENT: We continue to have concerns about whether there will be meaningful public, State, Tribal, and local government participation in the Five-Year Plan process, especially as it relates to budget and prioritization. A case in point is the External Review Group (ERG). Although the Five-Year Plan references the ERG as evidence of increased public involvement, that group has been frustrated by DOE's lack of responsiveness to issues raised by ERG and a lack of commitment by DOE to open the priority system to external review. Putting it bluntly, meaningful external involvement implies that someone is listening. Improvement in this area is needed before the States are convinced that DOE is serious about the "culture change."
RESPONSE: DOE has become more responsive to external involvement and will continue to make more effort in this regard. The existence of the State and Tribal Government Working Group, (STGWG) and the External Review Group (ERG) are

examples of this effort. Many issues have been incorporated, including (1) the addition of socioeconomic factors in the analysis; (2) time-critical activities; (3) a plan to involve the Agency for Toxic Substances and Disease Registry (ATSDR) in evaluating health risk; (4) modifications to the Prioritization System Framework; (5) modifications to the system's compliance scale for more local issue responsiveness, (6) public involvement at the field office level; and (7) uncertainty reduction. ERG's past frustrations were the result of poor communications, and not a deliberate attempt by DOE to avoid external involvement in its priority system development. DOE has incorporated many ERG suggestions into the proposed system. It is the task of DOE to balance competing desires of many interest groups and develop systems that will respond effectively to those needs. DOE must continue to manage its own programs.

COMMENT: Once again Ohio EPA suggests that DOE be more clear about the mechanism they will use to provide funding to States and Tribes for oversight costs at DOE facilities.
RESPONSE: DOE is currently involved in development of the process by which State and Indian Tribes can be reimbursed for costs associated with oversight at DOE facilities. As the process becomes more fully developed, States and Indian Tribes can be expected to make a contribution.

COMMENT: The Five-Year Plan should list separate funding requirements and/or actions for each individual site to identify whether each facility's obligations are being met for all fiscal years and each Five-Year Plan Activity Data Sheet format should be consistent.
RESPONSE: DOE agrees that information showing separate funding requirements and/or actions for individual sites is needed. Such detailed information, however, is not included in the Five-Year Plan. Site-Specific Plans (SSPs), located at each field office for easy access by the public, present projects in sufficient detail to determine whether a facility's obligations are being met for the fiscal years shown on the Five-Year Plan. Standardization of Activity Data Sheets (ADSs), the basic planning building block, will enhance the DOE planning process.

COMMENT: Thank you for the copy of the above-referenced document and the opportunity to provide comments. The New York State Department of Environmental Conservation (NYSDEC) is pleased with the DOE initiative to develop a plan for cleaning up its facilities.
RESPONSE: DOE appreciates the opportunity for positive interaction with the NYSDEC in development of a plan for environmental restoration at DOE facilities. Continued communication and interaction between the two organizations is considered vital to DOE for meeting its goals of environmental restoration and expanded community involvement.

COMMENT: There is considerable overlap between Priority 1 (imminent endangerment) and Priority 2 (Compliance Agreements) and, in fact, the two categories are not mutually exclusive.
RESPONSE: The overlap is perceived only. Activities covered under Priority 1 are clearly defined as addressing "imminent endangerment." Where such a situation exists these activities will receive the highest priority, the most attention, and the greatest amount of funding until the potential of imminent endangerment is removed. All known situations that pose an immediate threat to human health or the environment would be incorporated into any agreement. The Five-Year Plan addresses funding priorities.

COMMENT: Overall, we compliment DOE on the Five-Year Plan. It indicates DOE's emphasis on environmental awareness and ethic and lays the groundwork for the future.
RESPONSE: DOE provides waste management and environmental restoration planning and funding information to other Federal agencies, States, and the general public. The 5-year planning process has proved to be an effective mechanism for obtaining public comment and for enhancing the credibility of the waste management and environmental restoration budget. DOE

strives to (1) continually improve the process to optimize input from all interested parties; (2) maintain a clear historic track of activities; and (3) ensure that up-front planning of present and future efforts required to meet Department needs is effectively accomplished.

COMMENT: The priority system appears to be too complex. There is also concern over the fact that it is driven by budget when in fact it should be driven by risk before budget. The system must lead to good planning and decision making without being too complex to be understood by regulators and other interested parties.
RESPONSE: The priority system is based upon an analytical approach to funds allocation, which includes consideration of environmental and human health risks. The decision to provide funds to specific activities takes into consideration the relative risks, technology availability, human resources, regulatory requirements, and other considerations that help shape a strategy for most effective use of available funds.
The priority system contains a screening process that divides activities into three classes in order of decreasing urgency and importance:
Class 1. Emergency Activities — remedial actions or studies needed to prevent serious threat of significant and immediate human exposures that are hazardous to the public health. Field offices are directed to seek immediate funding for such activities.
Class 2. Time-Critical Activities — certain specified types of remedial actions or studies necessary to avoid unacceptable, irreversible consequences that could occur if actions are delayed. These activities include (1) actions required to stabilize known deteriorating situations, and (2) studies of areas that are suspected, but not known, to pose immediate health or environmental risks or the risk of rapid deterioration.
Class 3. Other high-benefit and time-sensitive activites — activities required by regulations, or otherwise needed to achieve environmental restoration objectives in a timely manner. These activities include, for example, situations involving potential future risks for which urgent action is not necessarily needed. Unlike Classes 1 and 2, priorities for conducting activities in this class must be determined by considering and weighing a variety of factors. A quantitative scoring process will be used to evaluate activities in this class.

COMMENT: The Five-Year Plan should list separate funding requirements and/or actions for each individual site to identify whether each facility's obligations are being met for all fiscal years and each Five-Year Plan Activity Data Sheet (ADS) format should be consistent.
RESPONSE: Section 3 of this Five-Year Plan provides separate actions and funding for each of the key individual installations. Details on installation's efforts in meeting milestones can be found in Appendix D. The Activity Data Sheet format for this year's Five-Year Plan was consistent for all installations and field offices.

COMMENT: DOE is not providing sufficient information on off-site contamination (LANL and Mound meetings) and is not aiding private citizens who wish to "monitor" these sites.
RESPONSE: As part of the Community Relations Plan prepared and implemented at Los Alamos National Laboratory (LANL) and Mound, DOE has provided public information centers that are available to special interest groups and the general public. Environmental restoration documents, including RCRA Facility Investigations (RFIs), Corrective Measures Studies (CMSs), Remedial Investigations (RIs), Feasibility Studies (FSs), Work Plans, Environmental Assessments, Environmental Impact Statements, and all supporting documentation, are provided at these locations.

COMMENT: There's a Programmatic EIS to determine priorities for cleanup, nationally. I've heard there won't be public comment opportunities in this area. Is there no opportunity for my comments? If not, why not? I heard there will be no PEIS meetings in places that get site-specific five-year plans. Tell Headquarters that doesn't make a lot of sense.

RESPONSE: Twenty-two public meetings were held throughout the United States to discuss the Programmatic Environmental Impact Statement (PEIS). In addition, DOE has taken other steps to increase public involvement. In April 1990, DOE convened a Stakeholders' Forum to broaden the range of public involvement. Other meetings have involved State and Tribal Government Working Group (STGWG) and the ERG. Federal Register notices have been placed for the Five-Year Plan and the RDDT&E Plan, requesting comments. Public participation plans are also a component of Site-Specific Plans.

COMMENT: I salute this open process, and if this is going back to Washington, I especially think this is important. My family moved to Washington years ago, and just found out in the last year that the crab on which my family used to chow down is radioactive.
RESPONSE: DOE's nuclear programs have inherently maintained a concern for public health and safety. This concern has been expressed in propagation of DOE Orders and policies designed to provide the most appropriate level of safety and health protection consistent with scientifically based information. As the base of technical knowledge has expanded and the risks from management, release, and disposal of radioactive materials has been clarified, DOE has imposed more stringent standards on its facilities. DOE recognizes that historical practices may have resulted in unacceptable releases of radioactive materials; however, many were considered acceptable, based on the knowledge of the time.

COMMENT: Real evidence of the culture change in DOE is when the Energy Secretary would not let the Savannah River Plant go on-line because there was some concern about worker safety training, even though the nation had not tritium manufacture ready and the people onsite thought they were ready.
RESPONSE: DOE will continue to set high standards for its personnel and contractors to ensure personnel and public safety and protection of the environment. It is DOE policy to evaluate risks when consideration is being given to reducing applicable standards, such as training levels, to meet a national need. The purpose is to determine whether it is in the national interest to accept the identified risks. In the case of tritium production, for example, it was determined that accepting risk associated with using inadequately trained personnel to produce tritium was not in the national interest.

COMMENT: Talk of culture change is empty posturing until DOE is seriously committed to protecting whistleblowers. The recent proposed DOE rule for whistleblower protection is fatally flawed.
RESPONSE: DOE has taken a proactive position to protect employees and individuals who are willing to advance information concerning inadequacies within the Department and on DOE sites. DOE is continually striving to improve its program and will welcome any identification of problems. It is the goal of the Department to optimize its programs to protect personnel and to ensure that the issues brought forth will be dealt with fairly and expeditiously.

COMMENT: DOE should endorse the trust fund bill wholeheartedly to demonstrate its motivation and sincerity about cleanup.
RESPONSE: DOE believes the important goal, or end, is to achieve cleanup — not to use a specific mechanism, or means, to achieve it.

COMMENT: For those outside the nuclear weapons complex, protecting the environment and people has always been more important than bombs.
RESPONSE: All DOE facilities are expected to support responsible environmental management as part of their work ethic and organizational philosophy. Previous waste generation from the DOE weapons complex is now being addressed by a series of environmental compliance, waste management, and health and safety activities.

COMMENT: Are you taking the political as well as technical problems into consideration?

RESPONSE: While political considerations cannot be ignored, technical issues pertaining to public health and the environment are the prime focus of DOE programs. DOE is aware that public concerns are very important in any cleanup program. The existence of Federal regulations and agreements between the Department, States, and the Federal government underscores this issue.
In order to evaluate political concerns, DOE has undertaken a program to solicit public comments on all issues of community concern. In April 1990, DOE convened a Stakeholders' Forum to broaden the range of public involvement. Other meetings have involved the State and Tribal Government Working Group and the External Review Group as well as Federal and State representatives, Indian Nations, and several national environmental groups.
Local involvement was solicited from meetings on the PEIS in late 1990 and early 1991 to discuss the ER Priority system and ADSs. Public participation plans are also components of the Site-Specific Plans (SSPs).

COMMENT: Taking care of waste is a prime concern and we need to feel the people in D.C. aren't dumping on us just because we're far away. It benefits those guys to send it here, we only have a few legislators here. So if we accept major amounts of waste, the people in D.C. will perpetuate that. That's the problem.
RESPONSE: Selection of waste repositories is based upon specific environmental, public health, and environmental criteria that are consistent with national policy objectives legislative actions. These technical criteria are intended to identify the most appropriate sites for waste disposal and are not biased toward geographic locations of areas of low population density.

COMMENT: Once again, it appears a vital public interest in the West may be overrun by special interests in the Eastern States. When it comes to federal dollars for nuclear waste cleanup, powerful Southern members of Congress will always see that Savannah River Site comes first. The Defense Establishment will always protect production facilities that turn out materials for nuclear weaponry. Hanford is out of the production business.
RESPONSE: Funding for DOE activities is based upon congressional appropriations; however, allocation of DOE resources among facilities is not generally subject to congressional approval. DOE has established a planning process that identifies and defines the relative needs among installations for cleanup funds. Based upon this analytical process, DOE attempts to apply available funds to the areas of highest priority.

WASTE OPERATIONS

COMMENT: Attachment C - Waste Operations - page 399 - Additional funds are needed to process and dispose of low-level radiological waste currently stored at DOE-FMPC. The DOE-FMPC Site-Specific Plan indicates that no funds are available for processing and disposal of the 82,000 drum equivalents of backlogged low-level waste after FY 1991. Many of these drums are in extremely poor condition and are resulting in additional environmental releases and exposures to workers. DOE will also need the space occupied by these drums for staging wastes from the planned remediation of other operable units.
RESPONSE: Beginning on October 1, 1990, the Office of Environmental Restoration assumed responsibility for management of landlord and shutdown activities at the FMPC as well as continued responsibility for ongoing waste and environmental restoration operations. As a result, Environmental Restoration Program planning includes the necessary funding to ensure processing of FMPC low-level waste, including backlog inventory.

COMMENT: Attachment C - Waste Operations - Page 399 - This section mentions the need for funding of the $78 million settlement in the Fernald citizens class action suit. Lawsuit settlements or other court actions should not take funds already allocated for characterization and cleanup of DOE sites. DOE needs to develop a separate funding mechanism to address these actions.

RESPONSE: The reality of the budgeting process is such that DOE must budget for these costs just as it would any other expense. As a result, limited funds may have to be used to pay fines instead of being used for environmental management activities. For this reason, some States do not fine other units of government. These funds are used for upgrading facilities or operations rather than for paying fines.

COMMENT: Region IX has recently received copies of DOE's draft "Tiger Team" Assessments for Lawrence Livermore National Laboratory (LLNL) and Sandia National Laboratory (SNL). The Tiger Team assessments were conducted earlier this year and evaluated environmental, safety, and health issues at the laboratories. These reports include construction projects and other recommendations to correct environmental problems and to ensure compliance with environmental protection requirements.
We understand that DOE Headquarters has issued a memorandum instructing its operations offices to integrate recommendations made by the Tiger Team assessments with the A-106 pollution abatement planning process and Five-Year Plans.
Region IX strongly supports this integrated approach. Recommendations of Tiger Team assessments should be included in the Five-Year Plan to promptly remedy existing compliance problems, to ensure DOE environmental commitments are fully addressed, and to prevent future compliance problems.
RESPONSE: Integrated approaches to resolving outstanding issues are complex and require time to implement. Your recognition and support is greatly appreciated.

COMMENT: On September 11, 1990, EPA announced its final decision to deny a permit application by DOE for the continued operation of a hazardous waste incinerator at Lawrence Livermore National Laboratory (LLNL), Livermore, California. For your reference, a copy of the 9/11/90 Region IX press release and an Oakland, CA Tribune article are attached. EPA is currently reviewing application materials submitted by DOE and the University of California for continued operation of the remaining RCRA-regulated hazardous waste storage and treatment facilities at LLNL.
Should the storage and treatment application be denied, LLNL will be required to cease the storage and treatment of RCRA-regulated hazardous wastes. LLNL will need to find acceptable alternative methods of waste management. Alternative methods may include waste minimization, source reduction, recycling, and offsite treatment, disposal, or incineration of RCRA hazardous wastes. Denial would not affect wastes that are solely radioactive, listed as hazardous only by the State of California, or PCB wastes regulated under Toxic Substances Control Act (TSCA). The Five-Year Plan should provide appropriate funding mechanisms to ensure DOE and the University of California are in full compliance with RCRA in the event the pending RCRA storage and treatment application for LLNL is denied.
RESPONSE: LLNL has included an ADS for the construction of a mixed waste treatment facility. Whether this facility will receive funding in the FY 1993 budget is uncertain at this time. However, the Office of Waste Management supports getting this facility into the range of projects that would be funded. The Office of Environmental Management is also continuing to prepare a PEIS that will address alternative methods of waste management.

COMMENT: The Five-Year Plan should state that all existing open burning/open detonation activities are subject to RCRA's November 8, 1992 storage and treatment permitting decision deadline. If DOE has not already done so, RCRA Part B applications and/or closure plans should be submitted to EPA or appropriate State regulatory agencies to ensure final permit decisions are made by that deadline date.
RESPONSE: DOE is aware of this deadline and is working to comply with this requirement.

COMMENT: Concerned Citizens for Nuclear Safety does not believe DOE utilizes the correct definition of high-level waste and

as a result, DOE ". . . is burying dangerous radioactive wastes from nuclear research reactors at the low-level waste landfill at LANL." Questions related to fuel elements/ rods from these reactors and their disposition.
RESPONSE: High-level waste is defined by law and regulation, and that is the definition that DOE uses. Government-owned spent fuel that has not been reprocessed is stored at DOE facilities awaiting final disposition. The safest, most technically sound storage of these fuel elements is borehole confinement, which is a temporary action.

COMMENT: Air emissions at the KCP should be monitored more closely and efforts to reduce or eliminate all emissions should continue.
RESPONSE: DOE is currently reducing air emissions through a Corrective Activity for its spray paint booths. This project will provide the equipment and upgrades necessary for Kansas City Plant (KCP) to meet its air pollution permit.

COMMENT: Perhaps the most significant feature of the overall plan (Sec. 4.4. pages 152-153) relative to southern Nevada is the proposed development of "Regional Disposal Centers" for low-level and mixed wastes. The NTS will become one of these regional sites; in fact, it already is. NTS currently accepts waste from the Lawrence Livermore National Laboratory, Sandia National Laboratory, and some of the waste stream from Rocky Flats, Colorado, as well as the low-level waste generated on the NTS.
RESPONSE: The Nevada Test Site (NTS) has received waste from other sites and may do so in the future pending resolution of issues with the State of Nevada. DOE is also evaluating other sites for disposal of these wastes.

COMMENT: Mention is made that NTS will become a storage facility servicing 16 other "offsite generators." This is blatantly unfair to the State of Nevada which has already been targeted by Congress as the likely site of the Nation's high-level nuclear waste. To become the repository for the low-level and mixed waste from other cleanup areas as well, is unacceptable. As the Mayor of the largest incorporated city in Nevada, I object to the thousands of truck loads of those shipments passing through the center of Las Vegas enroute to the NTS and endangering the public health and safety of our citizens. Further, such a plan should require a new environmental impact statement before any decision is made to move these wastes from other facilities to the NTS.
RESPONSE: NTS has successfully operated disposal facilities at NTS for the past twelve years. Defense Low-level Waste is received from 16 offsite generators which are components of the Department's Defense Production Complex. Other facilities within the DOE complex also receive waste for treatment, storage, or disposal from offsite generators.
Shipments to NTS are conducted in compliance with all Department of Transportation (DOT) regulations pertaining to packaging, placarding, and route selection criteria. Routes are chosen based on roadway surface conditions, and heavily populated urban areas are avoided whenever possible. There has never been a transportation accident which resulted in the release of radioactive materials.
The Department of Energy is currently in the public scoping and planning stages of a Programmatic Environmental Impact Statement (PEIS) which will address complex-wide options for future Environmental Restoration and Waste Management activities. In addition, the EM Configuration Study (currently under development) will examine various treatment, storage, and disposal options from a programmatic, complex-wide viewpoint. Waste operations at NTS will be considered in this report. Finally, beginning in FY 93, the ERWM Program at NTS will initiate the preparation of a site-specific EIS for Waste Management Operations and Environmental Restoration.

COMMENT: Unless the Federal Government uses its authority in the Atomic Energy Act, legal and regulatory disputes will block development and transportation to repositories.
RESPONSE: DOE prefers to develop a consensus approach in the planning of the Federal repository. The observation that

significant legal and regulatory hurdles remain is correct. The Atomic Energy Act adds strength to the mission of DOE and provides avenues for resolution of these concerns.

COMMENT: The Heart of America has asked Secretary Watkins in Five-Year Plan comments not to ship wastes to potentially unsafe repositories until there is a Programmatic EIS.
RESPONSE: The PEIS is under preparation and, in conjunction with the configuration study, will address this issue. No waste will be shipped to an unsafe repository.

COMMENT: Responsibility for establishing and maintaining a nuclear waste system must not be deferred to future generations.
RESPONSE: DOE agrees and it is trying to establish a nuclear waste system that meets all regulatory environmental and safety requirements.

COMMENT: Are there any options to WIPP being considered?
RESPONSE: DOE's principal strategy for managing transuranic (TRU) waste is based upon the development of a geologic repository. For over 10 years, the focus of this effort has been Waste Isolation Pilot Plant (WIPP). WIPP will continue to be the primary focus for TRU waste disposal.
COMMENT: The League of Women Voters of Oregon supports the U.S. Government Accounting Office which states that radioactive waste be characterized at the sites. By doing so, it would be unnecessary to bring radioactive waste from other nuclear weapons production facilities to an already overburdened Hanford.
RESPONSE: DOE is currently upgrading characterization capabilities at several facilities. This increased capability should result in less waste being shipped to Hanford for the purposes of characterization.

COMMENT: Dan Silver told me the Governor just lodged a strong complaint over a proposal to send 600 leaky uncharacterized barrels to Hanford.
RESPONSE: As far as we can tell from this comment, there are no plans to send 600 leaking barrels of uncharacterized waste to Hanford. This comment is not sufficiently detailed to provide an adequate response. If the commenter can provide more detail, an adequate response can be given.

COMMENT: Given the resistance to the high-level and TRU waste repositories by the governors of those States, has the Federal government really found a place for the waste, or is it just turning the waste from liquid to solids?
RESPONSE: DOE continues to plan for the repository for the disposal of high-level waste while addressing other issues involved with the repository. Solidifying high-level liquid waste is an important intermediate step in disposing of the waste in a way that meets regulatory requirements. DOE intends to work in parallel with the States in resolving the issues associated with the repositories.

COMMENT: Training should begin well before shipments. Four years in advance is not too soon.
RESPONSE: Adequate training of DOE and its contractor personnel is an important key to providing safe operation of all aspects of the DOE waste operations complex. It is DOE's practice to continue to provide high quality training for all personnel involved.
COMMENT: The citizens' view is that TRU wastes should not be shipped to New Mexico to contaminate that State. We should not do this to New Mexico.
RESPONSE: The comment is appreciated; however, DOE believes that WIPP will contain the waste, not contaminate New Mexico.

COMMENT: WIPP transportation safety concern: FEMA or another agency should provide protection along the route. Cabbage Hill is unique and requires holding stations east and west of the pass. Ditto for Ladd Canyon.
RESPONSE: Through a cooperative agreement with the Western Governors' Association (WGA), DOE has been working with the states along the WIPP shipping

corridor to address transportation safety issues. Among those issues examined are the unique geographical characteristics of areas along the shipping route, like Cabbage Hill and Ladd Canyon. Procedures and protocols are being developed to help ensure safety along the route. Some of these procedures include: safe parking areas; emergency notification procedures; emergency response procedures; vehicle inspection policies; and bad weather protocols which describe weather conditions which would preclude travel over certain roads.

COMMENT: On page 12 of the Overview, DOE calls the New Mexico TRU waste repository a "permanent site," when it is actually only an experimental pilot project.
RESPONSE: If the test demonstrations are successful, WIPP will become a permanent disposal site. However, the success of these demonstrations will not be known for some time, and the waste will be placed in a retrievable condition until after the pilot project.

COMMENT: DOE should set a clear schedule for shipping TRU waste to the repository in New Mexico.
RESPONSE: DOE plans to establish a schedule after all regulatory concerns are met and the test demonstration phase is complete. Should the demonstrations be successful, a schedule will be completed.
COMMENT: DOE should ship Hanford waste to the repository in New Mexico for its 5-year test phase.
RESPONSE: During the test phase, WIPP is constrained to handling certain types of waste within DOE. Hanford's TRU waste was not selected for the test phase, although WIPP is designed to handle Hanford's volume of TRU waste. WIPP will receive Hanford TRU waste once the demonstration phase is successfully completed.

COMMENT: DOE should announce soon the schedule and number of shipments to WIPP in its first 5 years.
RESPONSE: A schedule for the shipment of waste to WIPP will be finalized upon the commencement of the WIPP test phase. A schedule for the shipment of waste after the successful completion of the test phase will be developed before the opening of WIPP for normal operation. A more detailed schedule is unavailable at this time because of the test nature of the preliminary phase. This phase is an action where controlled shipments will be made to WIPP to test its viability.

COMMENT: Oregon expects advance notice of 10 to 12 months to allow it to schedule emergency response training.
RESPONSE: DOE will make every effort to provide sufficient notification to allow for the training.

COMMENT: Monitored retrievable storage is necessary. Today's waste is tomorrow's resource.
RESPONSE: DOE agrees that monitored retrievable storage of waste is needed.

COMMENT: The repository should not be in rock.
RESPONSE: The location for WIPP was chosen for its stable geologic formation. This formation is a type of salt that is expected to provide adequate protection for the disposal of TRU waste.

COMMENT: Concentrate the dangers: do not ship the wastes to New Mexico and contaminate that State.
RESPONSE: DOE is of the opinion that the waste deposited will not contaminate the area because WIPP's geological make-up is able to provide long-term containment.

COMMENT: Leave all the waste at Hanford and monitor it in perpetuity to protect citizens and the environment.
RESPONSE: Some waste, such as low-level radioactive waste, will be disposed of at Hanford, but other facilities, such as WIPP, are specifically designed to manage other types of waste and, therefore, it is appropriate to dispose of certain wastes at specially designed facilities.

COMMENT: With regard to page 2-11 of the detailed plan, DOE should be barred

from grouting any additional waste at Hanford until the regulatory issues are resolved. HEAL maintains that part of the waste going into grout will be high-level waste by definition. Therefore, the NRC must license the grout facility in a public process.

RESPONSE: DOE recognizes the need to comply with all environmental regulations before grouting. The grout facility treats and disposes of the low-level fraction of double-shell tank waste. This process was demonstrated satisfactorily to the NRC before operation of the facility.

COMMENT: Hanford continues to receive the nation's nuclear waste because Easterners think this area has no people.

RESPONSE: Because some of the eastern sites also receive nuclear waste, this comment is unfounded. The reasons for selection of disposal sites for mixed waste are many and include safety, ability to comply with environmental regulatory requirements, and capacity. Remoteness of a site is considered but is not the overriding concern when taken in light of the other previously mentioned criteria.

COMMENT: Shipping glass logs to Germany will require involvement by affected States:

- The Environmental Assessment for shipping glass logs to Germany should consider safety in the route selection.
- Oregon will determine if the logs can be shipped safely through that State after reviewing the EA.
- Oregon's governor expects at least 3 months notice if the route is through Oregon.
- If the route is through Oregon, the State expects DOE to set up special procedures to assure quality operators, avoid foul weather, prepare emergency crews, and inform local officials on the route.

RESPONSE: The EA has been drafted to review the shipping routes for the glass logs, which may be shipped to Germany through ports in Seattle, Portland, or Houston. Once Germany determines it wants the logs, the EA will be finalized and a Record of Decision (ROD) issued. Shipment of these logs will begin in FY 1993, at the earliest, and the shipment will be paid for by the Federal Republic of Germany. Proper notification of shipping routes will be given to the appropriate authorities after the EA is finalized.

ENVIRONMENTAL RESTORATION

COMMENT: Section 1.2 discusses the need for flexibility to ensure successful plan implementation. The State of Ohio strongly supports the need for funding flexibility to respond to discoveries that require immediate remedial action. However, the proposed Near-Term Response Fund appears to be directed only at major actions. From experiences at the DOE-Fernald Facility, we have noted circumstances where increases in various characterization programs (RI/FS) throughout the year resulted in a virtual work stoppage at the end of the fiscal year due to a shortage of funds (August-September, 1989). DOE also needs to have flexibility and funding mechanisms to address this type of funding crisis that does not develop as the result of a major new environmental problem discovery.

RESPONSE: DOE acknowledges and shares the concerns raised by this comment. As stated in Section 1.9 of last year's Five-Year Plan, the Federal budget system is not able to easily accommodate the sudden need for extra funds to address an unforeseen problem that may arise. The reprogramming of funds from one activity to another is, generally, not a satisfactory solution as it may involve the transfer of funds from one appropriated account to another. Such transfers require notification of Office of Management and Budget and Congress to obtain the necessary approvals authorizing such transfers. However, DOE is continuing to explore alternative approaches for meeting such sudden, unforeseen need for near-term response funds.

COMMENT: Attachment C - Waste Operations - Page 298 & 299 - This section states that the Remedial Investigation/ Feasibility Study (RI/FS) program has been initiated for most operable units and that

three complete RI/FS work plans have been generated. In actuality, the only work plan submitted under the FFA is for the Site-Wide operable unit. The two other work plans are limited investigations for scoping activities, not RI/FS activities. Work has been done without the oversight of the regulatory agencies on RI/FSs for some of the operable units, but not most of them. The FFA has only recently been signed, and considering that we are currently in the scoping phase of the program, it is incorrect to state that we have initiated the RI/FSs for most of the areas.
RESPONSE: DOE acknowledges the inaccuracy and will ensure that the FY 1993 - 1997 Five-Year Plan accurately reflects the true status of Mound RI/FS activities.

COMMENT: Attachment C - Waste Operations - Page 298 & 299 - In spite of the work that has been previously done, it is premature to say that cleanup will start on two of the operable units in FY 1992. These prior studies will have to be reviewed and confirmation studies done. In addition, risk assessments will need to be prepared, as well as complete feasibility studies. After the Record of Decision has been made, the remedial design is initiated and completed prior to the start of any cleanup.
RESPONSE: DOE acknowledges that various prerequisite activities - reviews, confirmation studies, risk assessments, and FSs - will need to be carried out before cleanup can be undertaken. However, activities set forth in the Five-Year Plan are intended to reflect current DOE planning. Annual updates of the Plan provide the opportunity for DOE to revise such planning if completion of such prerequisites to cleanup is likely to be delayed.

COMMENT: Page 406 & 407 - DOE should keep in mind that the Ohio EPA permits are required for a number of the mentioned activities, including incineration, hazardous/ mixed waste storage, etc. The time required to obtain these permits should be taken into account in the schedule.
RESPONSE: DOE is aware that many of its proposed activities will require permits from the appropriate States. Headquarters personnel are working with the field staff to ensure that schedules properly reflect the time it takes to receive the required permits.

COMMENT: It is not evident that the Plan will be consistent with a Federal Facility Interagency Agreement (IAG) currently under review by DOE.
RESPONSE: DOE intends that activities set forth in its Five-Year Plans be consistent with all requirements. Annual updates of the Five-Year Plan provide the opportunity for DOE to revise its planning in this regard.

COMMENT: It is not evident that necessary funding for conducting remedial investigations and actions at Brookhaven National Laboratory (BNL) will be appropriated and made available in a timely fashion.
RESPONSE: As noted in our response to another comment, estimates of needed funding for Brookhaven are under review as part of activities connected with the FY 1993 - 1997 Five-Year Plan.

COMMENT: With respect to funding, Attachment B presents the environmental restoration funding summary by site. The funding projections for BNL are comparatively low to other sites handled by the Chicago Field Office. In FY 1996, only $61,000 has been budgeted for BNL environmental restoration activities. The dollar amounts allocated to BNL appear to be seriously deficient and may restrain or even prohibit the implementation of remedial activities as required by the IAG. This would be unacceptable to the New York State Department of Environmental Conservation. The NYSDEC would again request that necessary funding be made available to ensure continued and thorough investigations and completion of remedies at the BNL site.
RESPONSE: Estimates of needed funding are reviewed as part of activities connected with the annual update of the Five-Year Plan. DOE will undertake to confirm Brookhaven funding requirements for the upcoming update.

COMMENT: Brookhaven National Laboratory - Page 316-317 - "Extent/Types of Contamination" - The soils contain contaminants other than oil as described here.
RESPONSE: DOE acknowledges that soil contamination at Brookhaven involves more than just oils.

COMMENT: Pages 316-317 - Landfill remedial actions will be evaluated through the RI/FS process. The landfills will not be permanently capped in 1992, as shown in the Five-Year Plan, unless the remedial action is selected in a ROD.
RESPONSE: DOE recognizes that the Brookhaven landfills will not be permanently capped unless this remedy is selected in the ROD. For planning purposes, such selection is assumed.

COMMENT: Formerly Utilized Sites Remedial Action Program (FUSRAP) - pages 334-335 -"Status" - RI/FS's are not currently under way at the Wayne Interim Storage Site (WISS) or at the Maywood Interim Storage Site (MISS) although fieldwork is scheduled to begin at the MISS this fall. EPA is currently reviewing the MISS RI work plan, but we have not received the WISS RI work plan.
RESPONSE: DOE disagrees with this comment. EPA Region II (Mr. Steven Luftig, Director of Emergency and Remedial Response Division) was notified by separate letters, each dated October 15, 1987, from Mr. S. W. Ahrends, Director of Technical Services Division, DOE Oak Ridge Field Office, that RI/FS activities had been initiated in connection with, respectively, the Wayne and Maywood FUSRAP sites.

COMMENT: Pages 334-335 - This states that draft RI reports will be issued in FY 1991. According to the draft schedules for the WISS and MISS proposed to EPA by DOE, EPA will not receive draft RI reports until FY 1992. EPA would like an expedited schedule where documents will be received much sooner. The draft RI reports will not be released to the public until after EPA has reviewed them.

RESPONSE: The draft RI reports identified in the Five-Year Plan concerning the Wayne and Maywood sites are in reality planning/scoping documents for each of the sites. Schedules for developing the RI/FS documentation for the WISS and MISS will be incorporated into the site FFAs.

COMMENT: Pages 334-335 - The IAG's for the WISS and MISS have been signed by DOE and await signature by EPA.
RESPONSE: DOE acknowledges the signing of IAGs by both EPA and DOE with respect to the Wayne and Maywood sites.

COMMENT: Funding information for the FUSRAP site is not broken down sufficiently to determine whether adequate funding is planned for the WISS and MISS.
RESPONSE: Funding estimates for the various FUSRAP activities are aggregated by State (or by several States) for purposes of preparing the Five-Year Plan. Such aggregations are essential if the plan is to be kept to a tractable length. More detailed funding estimates may be found in FUSRAP-specific documentation such as the FUSRAP Site-Specific Plan.

COMMENT: While U.S. EPA agrees that there needs to be a rationale in designing characterization efforts, U.S. DOE must also recognize that characterization is a multi-phased process and that funding and field crews must accommodate this normal progression.
RESPONSE: DOE is fully aware that site characterization is a multiphased process, the requirements for which are derived from the provisions of RCRA or CERCLA. DOE's intent is not to circumvent the prescribed process but, rather, to carry out sufficient characterization so as to meet regulatory requirements with maximum efficiency, operational cost-effectiveness, and minimum risk.

COMMENT: EPA agrees that imminent threats must be addressed through removal actions, but DOE is not implementing this philosophy. The DOE organization does not

appear to be able to mobilize and get time-critical removals under way.
RESPONSE: DOE recognizes the difficulty it is having in implementing the EPA's concept of "bias for action," and it is trying to improve its performance in this regard. For example, three expedited removal actions are currently under way at Hanford, and the Richland Field Office, in consultation with the EPA and the State of Washington Department of Ecology, is working to identify additional time-critical removals.

COMMENT: DOE needs to review cost estimates being prepared for removal and remedial response actions. Costs seem very high compared to costs for work being performed in the private sector.
RESPONSE: Although DOE attempts to develop accurate cost estimates to request adequate funds for carrying out Environmental Restoration activities, it is agreed that areas of considerable cost uncertainty exist. DOE is undertaking the establishment of a formal process for review of costs submitted with the Five-Year Plan Activity Data Sheets to improve its performance in this regard.

COMMENT: The plan incorrectly states that the cleanup of RMI "is being performed in conjunction" with FMPC cleanup. These are unrelated activities at facilities that are over 250 miles from each other.
RESPONSE: The intent here was simply to indicate that the Feed Materials Production Center (FMPC) site office is also responsible for carrying out the cleanup of the Reactive Metals, Inc. (RMI) facility, not that cleanup activities at RMI are an integral part of FMPC cleanup activities.

COMMENT: DOE should ". . . shorten the study phase and get on with remediation."
RESPONSE: Site characterization studies are a statutory requirement imposed by both RCRA and CERCLA. DOE does intend to adopt the EPA concept of "bias for action": undertake sufficient site characterization to determine whether there is a near-term risk; if a risk exists, carry out sufficient cleanup action to mitigate it. This concept will address that portion of a contaminated site that poses an immediate threat while allowing continuing site assessment to be carried out on a longer schedule.

COMMENT: Overall, the activities outlined in the site-specific plan for the cleanup of the Nevada Test Site (NTS) are acceptable and warranted. There is some question about the need to remove, package, and dispose of some of the lower level surface contamination. It is quite possible that these activities will lead to higher exposures and more liberation of material than if it were left in the current undisturbed state. It appears that a full assessment of the risk/benefit relationship for these activities has not been conducted, rather the drive for the actions is to make a show of "doing something to clean things up."
RESPONSE: DOE agrees with the substance of this comment. Although DOE generally intends that facilities and sites be returned to a condition suitable for unrestricted use, in certain instances, in-place remedies may be a preferred alternative by offering advantages of reduced handling and transportation risk as well as avoiding the need to develop new disposal facilities and sites. Selection of in-place remedies depends on (1) specific site conditions; (2) the type, nature, extent, and amount of contaminants present; (3) the availability of suitable stabilization technologies; or (4) agreed-to considerations as may result from the remediation or public interaction processes. In any case in-place remedies will require regulatory approval.

COMMENT: Although DOE's intention to clean up the NTS and restore the environment has merit, any gains will be offset by the storage of the 1.75 million ft^3 of wastes from other DOE sites at the NTS.
RESPONSE: DOE disagrees with this comment. Storage is concerned with the control of waste materials to prevent their release and their becoming, thereby, a hazard to human health, safety, and the environment. On the other hand, cleanup is concerned with the elimination or containment of hazards arising from uncontrolled release of contaminating wastes.

COMMENT: Only assurances from DOE prevent the Atomic Energy Act from overriding the Tri-Party Agreement.
RESPONSE: DOE strongly disagrees with this comment. The Atomic Energy Act (AEA) is concerned with purely radioactive materials and requires DOE to conduct its operations without undue risk. Under the AEA, DOE is essentially self-regulating. However, in addition to DOE's policy of complying with the letter and spirit with the various environmental statutes and regulations, DOE is also legally subject to the provisions of RCRA and CERCLA, both of which are underpinnings of the Tri-Party Agreement. Purely hazardous materials are regulated under the provisions of both RCRA and CERCLA. Radioactive materials are regulated under the provisions of CERCLA in addition to the requirements of the AEA. The hazardous constituents of mixed radioactive/ hazardous waste are subject also to RCRA. Remedial activities are further subject to important regulatory requirements imposed by various States.

COMMENT: Are we addressing Hanford cleanup as a national problem, a regional one, or is it State's rights?
RESPONSE: Just as the operations associated with DOE's nuclear complex are national in scope, the cleanup of the wastes associated with this complex is being addressed as a national problem. Cleanup activities at Hanford are an important aspect of this situation. DOE's policy regarding cleanup is to comply fully with the letter and spirit of the various applicable Federal, State, and local health, safety, and environmental statutes. This policy is the cornerstone of DOE's 30-year goal of cleaning up its nuclear installations.

COMMENT: Bet on this: when it comes to matching cleanup dollars with cleanup priorities, some DOE bureaucrat will try to cut us out because Hanford is "way out West somewhere, miles away from anything."
RESPONSE: As noted in the response to another comment, the cleanup of the wastes associated with DOE's nuclear complex is considered to be a national problem. All DOE installations, including Hanford, are addressed within this context. To aid in this regard, DOE is developing a formal methodology for setting cleanup priorities. The system will provide a measure of the relative priority of program elements against program objectives taking into account various factors such as risk to human health and safety, environmental protection, regulatory compliance, public concern, and long-term program costs. The system will be used to identify trade-offs among such factors and their relation to and effect on program benefits, to focus discussion concerning priorities, to provide a framework for evaluating program sensitivity to assumptions, and to support budget formulation and allocation decisions.

COMMENT: Hanford isn't the only place in the country doing this. What about the other 24 sites? Are they working together?
RESPONSE: As noted elsewhere in our response to other comments, DOE is addressing the cleanup of its nuclear complex as a national problem and is working diligently at all sites to carry out its policy of full compliance with the letter and spirit of applicable Federal, State, and local health, safety, and environmental regulatory requirements.

COMMENT: Employment for 30 years, that's good news. But $1 billion a year, did we really win the war? You're cleaning up one problem, but there are many more. What's the lesson you've learned in this?
RESPONSE: Waste connected with DOE's nuclear complex has been accumulating as a result of various operations spanning nearly five decades: first in connection with DOE's Defense Programs, more recently in connection with programs in Nuclear Energy and Energy Research. When the nuclear age dawned in the 1940s with the Manhattan Project, we had little knowledge of the degree to which nuclear and hazardous waste materials posed a danger to human health and safety or to the environment. Furthermore, during the earlier part of this period, the demands of World War II, Korea, and the cold war days of the 1950s and 1960s placed higher priority on nuclear operations and lower priority on the wastes generated from such operations. Given such priorities, our knowledge and understanding of such wastes

grew slowly. Although dangers were recognized, the techniques used, though standard practices of the day, are now known to have been inadequate. Priorities have changed and our knowledge has increased. We are now paying the price for our past practices. Increasingly over the past 20 years or so, the public, through Congress, has demanded that the potential for danger posed by wastes generated from past and present operations be eliminated. As a result, during this period more than two dozen major Federal regulatory statutes have been enacted that have placed increasing emphasis on health, safety, and the environment. Operations at Federal facilities are not exempt from these regulations but are subject to the same requirements inposed on the private sector. DOE is working to comply with these regulations. Response to this dynamic process has resulted in a large increase in our understanding of nuclear and hazardous waste effects and of the techniques for dealing with them. Our fundamental goal is to ensure that risks to the environment and to human health and safety posed by DOE's nuclear facilities and sites are either eliminated or reduced to prescribed, safe levels. This is the cornerstone of our 30-year cleanup goal.

COMMENT: Use the money for PUREX and new production at Rocky Flats to put into cleanup.
RESPONSE: Funds for PUREX and production operations at Rocky Flats are appropriated by Congress specifically for those purposes and cannot be used for cleanup. DOE does not have the legal authority to move monies from one appropriation account to another without congressional action.

COMMENT: I would only hope that DOE will be sensitive to the concerns of Nevada and that our objections to this proposal will be honored and that the waste from the national cleanup will go elsewhere as the "New Jersey Dirt" did several years ago. We, in Nevada, are doing our fair share now. It is time for other States to assume responsibility for these wastes.
RESPONSE: DOE understands the concerns raised by this comment. DOE evaluates various alternatives with respect to interim storage and final disposal of waste materials. Factors taken into account with respect to such evaluation include measures of risk to human health and safety, risk to the environment, regulatory compliance, public concern, and long-term program costs.

TECHNOLOGY DEVELOPMENT

COMMENT: DOE is understaffed; therefore it should put more efforts into training qualified personnel and developing new technologies through university and national laboratory consortiums and also set its goals realistically.
RESPONSE: The need for qualified staffing both within the Federal ranks of DOE and at DOE national laboratories is repeatedly recognized in the Five-Year Plan. As indicated in Section 5.7.2 of the FY 1992 - 1996 Five-Year Plan, two major consortia are already under way. In addition, as indicated in Section 5.7 of the FY 1992 - 1996 Five-Year Plan, DOE sponsors a Fellowship Program to attract and train outstanding technical personnel for EM programs. Continuing and planned development of these programs is described in Section 2, Module 2.4.6.3.2 of this FY 1993-97 Five-Year Plan.
There is an effort to set goals realistically. Setting goals that are unrealistic only detracts from progress by misdirecting efforts toward the unattainable. On the other hand, DOE should set goals that are aggressive. Prompt action to solve current Environmental Restoration/Waste Operations problems will offset future needs for even larger, more costly restoration campaigns.

APPENDIX D

PRIOR COMMITMENTS

STATUS OF COMMITMENTS MADE IN FY 1992 - 1996 FIVE-YEAR PLAN

Milestones listed in last year's EM Five-Year Plan, which were scheduled to have been completed in FY 1990, are listed below. The milestones are organized by program. Because of the dynamic nature of the programs, and responsiveness to agreements, some commitments have not been met due to delays or modifications in the planned activities. Also, many additional activities were undertaken and completed in FY 1990, along with those milestones specified in the FY 1992 - 1996 Five-Year Plan.

OFFICE OF TECHNOLOGY DEVELOPMENT

1. Coordination with Office of Energy Research will include an annual review of basic research projects that are relevant to RDDT&E and preparation of a management plan that covers (1) expected time for implementation of technologies; (2) anticipated reductions in risk, health effects, and cost; and (3) links to near-term mission needs being addressed.
   Status: The Basic/Applied Research Working Group met in April 1990 to review basic research programs in the Office of Energy Research that might be appropriate for OTD support. Two research areas were designated as most likely to provide near-term applications. These are "Field Experimental Research Sites for Mixed Contaminants and Microbiological Processes," and "Basic Research for Characterization and Instrumentation Development."

2. Treatment of reactive metals will convert reactive metals into a glass residue in a demonstration to be completed this year.
   Status: The Reactive Metals Treatment Disposal project (CH-A-1071-00) has completed the batch and bench-scale tests and is presently on hold, pending availability of funds.

3. Demonstration on actual radioactive nitrate salts (Encapsulation of Waste Nitrate Salts Using Polyethylene Project) will be completed in FY 1990.
   Status: The Encapsulation of Waste Nitrate Salts Using Polyethylene project is scheduled for demonstration in FY 1991 at Rocky Flats. The siting problems with the large extruder were eliminated by converting to a smaller scale, mobile extruder. Testing is to occur this spring and summer.

4. The next cycle of 10 fellowships will be awarded in FY 1991.
   Status: For FY 1991, 10 graduate fellowships for students studying ER/WM-related areas were awarded by Oak Ridge Associated Universities. This is the third cycle of fellowships awarded, for a total of 30 graduate students receiving financial assistance to study critical ER/WM areas.

5. The efforts of the two pilot centers in the first half of FY 1990 have resulted in development of cooperative agreements between university and Federal partners that will allow implementation of the education plan initiatives outlined in the respective management plans.
   Status: The two pilot centers (academic partnerships) established in FY 1990 are implementing education initiatives outlined in the respective management plans. (An

additional partnership has been established with Historically Black Colleges and Universities and Minority Institutions.)

OFFICE OF ENVIRONMENTAL RESTORATION

1. Complete assessment on Abandoned Indian Creek outfall in FY 1990.
   Status: Completed

2. Complete three RCRA closures at LANL in FY 1990.
   Status: Completed.

3. Start three Decontamination and Decommissioning tasks at LANL in FY 1990.
   Status: Started.

4. Complete four Decontamination and Decommissioning tasks at LANL in FY 1990.
   Status: Not complete; Decontamination and Decommissioning in progress on one reactor and one hot cell facility.

5. Decommissioning of surplus NE areas in R-building at Mound Plant for return to reuse by DOE.
   Status: Completed.

6. Complete RI/FS work plans for three OUs at Mound Plant.
   Status: Not Completed. Still in process—under regulatory review and revision.

7. Complete four RCRA Facility Investigation Work Plans at the Pantex Plant.
   Status: Started as projected but not completed.

8. Initiate assessment of the 14 SWMUs at the Pinellas Plant as required by the Site HSWA Permit from EPA Region IV.
   Status: Initiated eight SWMVs.

9. Start interim remedial action for 4.5-acre site at Pinellas Plant.
   Status: Started.

10. Complete Chemical Waste Landfill cap at Sandia National Laboratories-Albuquerque.
    Status: Plans have changed due to regulatory influence. Interim cleanup measure was initiated.

11. Sandia National Laboratories -Livermore will submit NLF SWAT Report.
    Status: Submitted in FY 1990.

12. Obtain approval of Bench-Scale Treatability Study Work Plan at Sandia National Laboratories-Livermore.
    Status: Completed.

13. Pull Boost Surveillance and Tracking System (BSTS) cores at Sandia National Laboratories-Livermore.
    Status: Completed.

14. Complete BSTS at Sandia National Laboratory-Livermore.
    Status: Completed 1991.

15. Sandia National Laboratory-Livermore will submit Fuel Oil Spill FS to California RWQCB.
    Status: Completed.

16. Start RD/RA at South Valley site.
    Status: Completed.

17. Complete NEPA documentation at four additional UMTRA Project sites, with four remaining sites scheduled for completion during FY 1991.
    Status: For FY 1990, 1 site completed.

18. Complete site engineering at two additional UMTRA sites, with the five remaining sites scheduled for completion in FY 1991.
    Status: For FY 1990, 0 sites completed.

19. Complete remediation at 721 additional vicinity UMTRA properties and 4 additional sites (including one delayed from 1989), with 8 sites due to be under construction by the end of FY 1990.
    Status: For FY 1990, 640 vicinity properties and 4 sites completed.

20. Complete remediation at 510 additional vicinity UMTRA properties and one additional site (which had originally been scheduled to be completed in FY 1990) in FY 1991.
    Status: Milestone delayed 1 year.

21. Complete annual environmental radiological S&M activities and issue report for ANL-E surplus facilities and NBL-NJ property.
    Status: FY 1990 annual reports for S&M of ANL-E facilities completed. NBL-New Jersey site transferred to FUSRAP.

22. Complete disposal of waste tank sludge at Brookhaven.
    Status: Shipment of waste tank sludge to Hanford completed.

23. Complete shipment of low-level shielding debris from closed landfills at Brookhaven.
    Status: Shipment of low-level shielding debris is expected to be complete in mid-1991.

24. Complete annual environmental radiological S&M activities and issue report for HNPF, PNPF, and BCL surplus facilities at Chicago Operations Office Combined Laboratories.
    Status: Piqua (PNPF) and Battelle (BCL) S&M annual reports completed. Hallam (HNPF) report not prepared because of delays in receiving approval of proposed activities.

25. Complete BCL NEPA documentation at Chicago Field Office Combined Laboratories.
Status: EA for Battelle Columbus Laboratories Decommissioning Project completed; FONSI issued.

26. Complete D&D of three buildings (JS-1, JS-10, JS-12) West Jefferson Site, BCL.
Status: Decontamination and decommissioning of the three buildings at the West Jefferson site completed.

27. Complete soil remediation activities and installation of groundwater monitoring wells at Princeton Plasma Physics Laboratory (PPPL).
Status: PPPL is proceeding with necessary remediation activities.

28. Complete REAs at 450 vicinity properties to Grand Junction Project Office.
Status: Completed the radiologic and engineering assessments on the 450 vicinity properties by the end of FY 1990.

29. Complete remedial action on 650 vicinity properties to Grand Junction Project Office.
Status: Completed the remedial action on the 650 vicinity properties by the end of FY 1990.

30. Conclude Interagency Agreement (IAG) at Idaho National Engineering Laboratory (INEL).
Status: The IAG between DOE, the State of Idaho, and EPA is not yet complete. Negotiations are currently underway to finalize the details of the agreement which will be the governing force for environmental cleanup activities at the INEL. The agreement is expected to be signed during this summer. In the interim, activities are operating under direction of the IAG action plan.

31. Complete Buried Waste Program characterization at INEL.
Status: Significant changes in direction by regulatory agencies have occurred since the last issuance of the Five-Year Plan. GWP remediation activities are being planned and conducted in accordance with the pending IAG. The IAG regulatory base is CERCLA. The characterization of the Buried Waste at WAG 7 will be performed as a part of the Record of Decision (ROD) which is scheduled for completion in June of 1999.

32. Complete BORAX-V Turbine Building D&D at INEL.
Status: Asbestos cleanup within the Turbine Building is complete. Funding has been redirected from other tasks to ensure completion of the Turbine Building D&D in FY 1991.

33. Complete SPERT-IV waste removal and remedial action at INEL.
Status: The work at SPERT-IV was delayed due to the requirement for a Safety Analysis Report. This report has been completed and work is expected to resume. The activities will be completed in FY 1991.

34. Sign NTS Agreement-in-Principle (AIP) with State of Nevada.
Status: AIP signed in October 1990.

35. Complete Area 23 Hazardous Waste Trench closure at NTS.
Status: Closure plan modification submitted to the State of Nevada, October 1990.

36. Complete draft overall RI/FS Work Plan for NV at NTS.
Status: Continue to work on draft overall RI/FS work plan.

37. Issue ER Program for Reactive Metals, Inc. (RMI) at Feed Materials Production Center (FMPC).
Status: Implementation of the Environmental Restoration Program at the RMI facility in Ashtabula, Ohio, is currently on hold due to insufficient site characterization data. Investigations of new source terms are under way. Once this is accomplished, the RCRA Corrective Measures Study (CMS) and evaluation of alternatives can be finalized. NEPA documentation (the Action Description Memorandum) has been submitted by RMI to DOE. Once this document has been reviewed at the FSO, it will be submitted to HQ for approval.

38. TSCA incinerator at Oak Ridge K-25 Site is expected to be in full operation in FY 1990.
Status: HQ approved March 29, 1991; production operation commenced on April 5, 1991.

39. Issue Oak Ridge K-25 Site D&D Plan.
Status: Completed. Issued November 9, 1990.

40. Complete centrifuge equipment disposal at Oak Ridge K-25 Site.
Status: Forecast completion September 30, 1993.

41. Complete drilling of monitoring wells associated with basic network for principal Waste Area Groupings at Oak Ridge National Laboratory (ORNL).
Status: Completed September 1990.

42. Complete in situ vitrification of pilot-scale radioactive seepage trench at ORNL.
Status: Completed May 1991.

43. Complete decommissioning of Building 3033 Storage Garden at ORNL.
Status: Completed May 1989.

44. Complete waste removal from High Radiation Level Analytical Facility at ORNL.
Status: Completed February 1989.

45. Complete Phase I of work plan at Paducah Gaseous Diffusion Plant.
Status: Completed March 25, 1991. Phase II Site Investigation Work Plan submitted and approved by EPA.

46. Submit scope of work for investigation of PCB contamination in KDPDES outfalls at Paducah Gaseous Diffusion Plant.
Status: Completed.

47. Submit RFI work plan for Quadrants II and III at Portsmouth Gaseous Diffusion Plant.
Status: RFI work plans for Quadrants II and III were submitted to regulatory agencies in November 1989, and May 1990, respectively.

48. Complete ROD for quarry bulk waste removal at Weldon Spring Site.
Status: Completed March 9, 1991.

49. Issue Quarry RI/FS documents for Weldon Spring Site.
Status: Completed February 1990.

50. Issue Draft Site FS for Weldon Spring Site.
Status: Scheduled for release to public in June 1991. Slipped to January 1992. January 1991 review recognized major revisions.

51. Construct caps for five land-based sites at Y-12 Plant.
Status: Oil Landfarm completed 1Q FY 1990; Oil Retention Pond completed 3Q FY 1990; New Hope Pond completed 2Q FY 1990; S-3 Ponds completed 4Q FY 1990; Bear Creek Burial Ground C-West completed 1Q FY 1991; However, Bear Creek Burial Ground Walk-In Pits milestone will be missed due to safety concerns associated with closure of the walk-in pits.

52. Complete closure of RCRA land units at Y-12 Plant.
Status: Milestone will be missed because of problems with Kerr Hollow Quarry and Walk-In Pits.

53. Complete closure of Kerr Hollow Quarry at Y-12 Plant.
Status: Milestone will be missed because of numerous technical, safety, and waste management issues. Regulators have been notified and problems are being resolved.

54. Decommission East Borrow Area at Y-12 Plant.
Status: Milestone will be missed because of problems with Walk-In Pits/BCBG B closure.

55. Eleven work plans scheduled for submission at Hanford Site 100.
Status: Of the 11 work plans scheduled for the Hanford Site 100 (Areas), all have been completed and submitted to EPA and the State of Washington Department of Ecology.

56. Complete liquid solidification for 183-H Solar Evaporation Basin Closure at Hanford Site 100.
Status: 163-H Solar Evaporation Basin liquid solidification was completed in May 1990. Current work is focusing on soil sampling around and under the basins.

57. Prepare Decommissioning Draft EIS for Surplus Production Reactors at Hanford Site 100.
Status: The Draft Final Surplus Production Reactor EIS was completed and submitted to DOE HQ and the public for review.

58. Publish the Final EIS for Surplus Production Reactors at Hanford Site 100.
Status: The Final Surplus Production Reactor EIS and ROD are currently scheduled to be completed/published in FY 1991.

59. Submit seven RI/FS or RFI/CMS work plans for Hanford Site 100 to EPA and the State of Washington Department of Ecology for review/approval.
Status: This is part of the submission referred to in number 57 above.

60. Complete two RI/FS work plans for OUs 300-FF-1 and 300-FF-5 at Hanford Site 300.
Status: Remedial Investigation/Feasibility Study activities (groundwater well installation) have been completed and submitted for Operable Units 300-FF-1 on March 31, 1989 and 300-FF-5 on September 30, 1989.

61. Complete 300 Area Process Trench effluent treatment option conceptual design and establish schedule to implement treatment and cease liquid discharges at Hanford Site 300.
Status: The 300 Area Process Trench effluent treatment conceptual design and a schedule for ceasing liquid discharges were completed in FY 1990.

62. Complete remediation of one task at Rocky Flats.
Status: This commitment was established prior to finalization of the IAG. The first remedial task under the IAG is scheduled to be completed in the first quarter of FY 1992 (OU2 IRA).

63. Start assessment of 13 tasks at Rocky Flats.
Status: The finalized IAG called for the beginning of eight OU assessment tasks in FY 1990. These activities did commence on schedule. Twenty-two IAG milestones were scheduled and completed in FY 1990.

64. Complete assessment of one task at Rocky Flats.
Status: The negotiated final IAG calls for completion of assessment activities in OU1-881 Hillside in the first quarter of FY 1994. This represents the first assessment task to be completed. The FY 1990 commitment was invalidated by the finalization of the IAG.

65. Begin remediation of three tasks at Rocky Flats.
Status: In accordance with the finalized IAG, remediation activities commenced on three tasks in FY 1990; OU1 IRA, OU2 IRA, and OU15 Inside Building Closures (submitted closure plans). Remediation efforts are continuing on these tasks.

66. Submit draft FS report from LLNL.
Status: Completed. The draft FS report from LLNL was submitted.

67. Complete testing and evaluation at LLNL.
Status: Tasks completed.

68. Complete final RI for LLNL.
Status: The final RI for LLNL has been completed.

69. Complete draft FS for LLNL.
Status: Completed August 1, 1990.

70. Complete casting pad remediation at SLAC.
Status: Completed.

71. Continue D&D activities at Building 059. Remove activated steel and concrete at ETEC.
Status: Removal of shielding concrete has begun. All concrete and steel will be removed by April 30, 1992.

72. Complete closure of the M-Area Settling Basin/Lost Lake at SRS.
Status: Completed closure in second quarter of FY 1991.

73. Increase flow of A/M-Area Stripper from 400 to 610 gallons per minute at SRS.
Status: Increased flow to 610 gallons per minute.

74. Develop and submit 16 RFI Work Plans from SRS to regulators.
Status: Submitted 27 RFI Work Plans through the first quarter of FY 1991 to regulators.

75. Submit draft closure plans for the SRL and New TNX Seepage Basins at SRS.
Status: Complete.

76. Complete MWMF at SRS.
Status: Completed closure in first quarter FY 1991.

OFFICE OF WASTE OPERATIONS

1. Conduct annual AL and AL contractor permitting status workshop.
Status: Completed.

2. Conduct waste minimization workshop at AL emphasizing successes, problems, measurement systems, and regulatory requirements.
Status: Completed waste minimization management group formed at AL.

3. Complete hazardous waste facility upgrade, SNLL.
Status: Completed.

4. Obtain SEIS Record of Decision for WIPP.
Status: Completed June 1990.

5. Complete design and construction for TRU waste treatment facility at LANL.
Status: Postponed to FY 1997.

6. Set up explosive (reactive) hazardous waste storage area at SNLA.
   Status: Delayed; now an FY 1995 milestone line item; completion is expected by FY 2000.

7. Complete construction of a new liquid waste transfer line between TA-55 and TA- 50 at LANL.
   Status: Design complete - scheduled completion FY 1991.

8. Start DWPF cold runs at SRS.
   Status: Completed construction of in-tank precipitate facilities in first quarter of FY 1990, and started integrated cold waste runs in fourth quarter FY 1990.

9. End construction of the LLW disposal facility expansion at LANL.
   Status: Partial completion to date.

10. Depending on FY 1990 funding, procure Chemical Control and Inventory Tracking Computer at the Pantex Plant.
    Status: Inventory program scheduled March 1991.

11. Complete design and design criteria to upgrade the pH Neutralization Facility at the Pinellas Plant.
    Status: Completed.

12. Complete design to remove/replace USTs at Pinellas Plant.
    Status: Completed.

13. Prepare and submit RCRA Part A Permit Application for mixed waste for SNLA.
    Status: Completed

14. Establish a formal waste minimization program at SNLA.
    Status: Completed.

15. Implement Chemical Exchange with external agencies at SNLA.
    Status: Complete; exchange resulted in savings for FY 1990 of $35,694.

16. Implement Wastewater Data Automation at SNLA.
    Status: Monitoring system completion expected in FY 1991.

17. Dispose of 137 drums of actinide-LSC vial wastes at ITRI.
    Status: Waste Offsite - awaiting treatment.

18. Complete hazardous waste facility upgrade at SNL-Livermore.
    Status: Completed.

19. Complete TLR gas purification and waste recovery system at SNLL.
    Status: The upgrades to both systems are ongoing.

20. Obtain FSAR approval for WIPP.
    Status: Completed June 1990.

21. Obtain SEIS ROD for WIPP.
    Status: Completed June 1990.

22. Issue Plan for WIPP Test Phase.
    Status: Completed April 1990.

23. Obtain ESAAB decision for WIPP.
    Status: Completed February 1991.

24. Obtain No-migration Variance Petition for WIPP.
    Status: Completed November 1990.

25. Start-up of the SPF at ANL-W.
    Status: Sodium Processing Facility (SPF) has been built; operation is on hold pending reevaluation of PUREX at Hanford.

26. Assess the CH installations for waste minimization.
    Status: Waste minimization plans complete or under way for all Chicago Field Office installations. Annual Chicago Waste Minimization Workshop held in March 1991.

27. Complete HLW Leaching Studies Test Plan by Chicago Field Office.
    Status: Study plan for HLW glass testing has been completed; testing initiated.

28. LDR radioactive MW data base established by Headquarters (HQ) for National Report.
    Status: Data available on all DOE MW stream quantities expected by September 1991.

29. Publish Five-Year Plan.
    Status: The FY 1993- 1997 Five-Year Plan has been published in July 1991.

30. Submit radioactive Mixed Waste Treatment and Disposal Capabilities report from HQ to EM-30.
    Status: Will be completed for treatment capability in August 1991.

31. Issue Draft Integrated Data Base Annual Report.
    Status: Final FY 1990 IDB will be issued in October 1991.

32. Complete Environmental Assessment from Transuranic Waste Alternative Storage.
    Status: Comments to be provided to EG&G, Idaho, for further revision by August 1991.

33. Issue Summary Report on Field Compliance Order 5820.2A.
Status: Will be issued in September 1991.

34. Determine facility requirements and locations for waste analytical laboratory.
Status: Facility functional requirements, and locations will be defined by March 1991.

35. Complete removal of cesium capsules from RSI-Decatur Facility.
Status: Consistent with Secretary decision of November 1990. All commercially leased capsules will be returned expeditiously; all capsules at Decatur were returned and decontamination is under way.

36. NWCF will resume waste processing in July 1990 and is scheduled to operate for 15 months to reduce the HLW volumes from Idaho Field Office.
Status: The resumption of the NCF was delayed until October 1990. The restart was accomplished and the processing of HLW is under way and in progress.

37. Initiate elements of DOE Order 5820.2A at Idaho Field Office.
Status: Specific tasks to be implemented under 5820.2A for the INEL are included in the Idaho Operations Office 5820.2A implementation guidance. This document has undergone several revisions and is currently under review for finalization. In light of the actual implementation plan not being finalized, certain activities have been initiated in line with the Order where specific guidelines are not required.

38. Calcine 3884 m^3 of HLLW. (Idaho Field Office)
Status: The 3,884 m^3 of calcine refers to an annual figure of processed HLLW. The current rate of processing is on track with this estimate. It is anticipated that the actual volume of HLLW that will be calcined by the end of FY 1991 will match this projection.

39. Design, procure, install, and test sludge washing equipment at WVDP.
Status: This activity is currently ongoing and on schedule, with a projected completion this summer.

40. Prepare and file RCRA Part A Permit for radioactive mixed waste.
Status: This task was accomplished and completed in September 1990. An update to the permit is currently under way.

41. Process 10,000 drums of decontaminant supernatant at WVDP.
Status: This activity was completed on schedule in the fourth quarter of FY 1990.

42. Obtain WVDP RCRA Part A Permit for mixed waste.
Status: This task was completed on schedule in the third quarter of FY 1990.

43. Dispose of 1,200,000 ft^3 of LLW. (Nevada Field Office)
Status: Disposed of 389,000 ft^3 of low-level waste.

44. Dispose of 543,000 ft^3 of mixed waste. (Nevada Field Office)
Status: Disposed of 202,000 ft^3 of mixed waste.

45. Sign Agreement-In-Principle at Nevada Field Office.
Status: Signed AIP in October 1990.

46. Complete construction of Hazardous Waste Storage Pad at Nevada Field Office.
Status: Completed construction of hazardous waste storage pad.

47. Complete Environmental Monitoring Plan for Nevada Field Office.
Status: Completed environmental monitoring plan.

48. Complete Performance Assessment of Area % RWMS at Nevada Field Office.
Status: Performance Assessment is in process.

49. Finalize waste minimization plan for Nevada Field Office.
Status: Finalized waste minimization plan May 1990.

50. Begin construction on mixed waste storage upgrade for Building 7507 at ORNL.
Status: Construction will begin in June 1992.

51. Complete work on interactive LLW data base at ORNL.
Status: Completed in April 1990.

52. Complete CDR for Oak Ridge K-25 Site LLW Disposal Facilities.
Status: Completed February 28, 1990.

53. Complete construction of second tumulus for Oak Ridge Field Office.
Status: Completed July 31, 1990.

54. Complete construction of RCRA warehouse at FMPC.
Status: Construction completed with beneficial occupancy September 1990.

55. Complete the hazardous/mixed waste storage facility design for Oak Ridge Field Office.
Status: September 1991 preliminary design for waste storage facility will be completed by PIP team.

56. Test and inspect filters, supply replacements and emergency services for all eastern DOE facilities.
Status: Continuing for fiscal year.

57. Complete CDR for Oak Ridge K-25 Site LLWDF.
Status: Completed February 1990.

58. Submit draft EIS for Oak Ridge Reservation Waste Management Activities.
Status: Original date April 1991; revised date July 16, 1991.

59. Complete full-scale waste burns of the TSCA Incinerator at Oak Ridge K-25 Site.
Status: HQ approved March 29, 1991.

60. Issue TRU Waste Management Strategic Plan for ORNL.
Status: Completed March 31, 1990.

61. Complete conceptual design for Melton Valley liquid LLW for ORNL.
Status: Completed June 30, 1990.

62. Cat System upgrades at ORNL.
Status: Construction will be completed in FY 1997.

63. Submit hazardous/mixed waste storage facility CDR for PORTS.
Status: Submitted report August 7, 1990.

64. Complete the Radioactive Waste Incinerator Conceptual Design and Safety Analysis Report from PORTS.
Status: Met requirements by submitting conceptual design report as indicated in item 63. Milestone no longer applicable.

65. Complete work on CDR for the PWTF.
Status: CDR has been separated into four CDRs per DOE/ORO. Forecast dates TBD.

66. Complete construction of Groundwater Treatment Facility at Oak RidgeY-12 Plant.
Status: Construction not complete; interim fix is operational.

67. Start construction of remaining grout disposal vault at Richland Field Office.
Status: The grout disposal program for low-level waste is under way. Construction of the second through fifth grout vaults has begun. Vault construction will continue into the future to meet program needs. (This item originally referred to starting construction of other vaults once the first was filled, and this commitment has been met.)

68. Complete process condensate interim storage basin and restart evaporator at Richland Field Office.
Status: The Liquid Effluent Retention Facility for evaporation effluent will be completed in October 1991. Evaporator restart is delayed to December 1991 due to crane design and procurement, safety analysis scope change, and electrical work.

69. Complete Site Waste Minimization Program Plan for Richland.
Status: The Site Waste Minimization Program Plan was completed in May 1990.

70. Begin NEPA documentation for the replacement of the underground process waste transfer lines for Rocky Flats.
Status: Completed.

71. Sign Residue Compliance Agreement addressing the development of a system for regulating radioactive mixed residues under the Colorado Hazardous Waste Regulations. Complete an inventory report, a draft compliance framework, and a residue characterization report.
Status: Completed.

72. Begin operating the supercompactor at Rocky Flats.
Status: Scheduled to begin FY 1992.

73. Complete application packages for mixed waste shipments to NTS from Rocky Flats.
Status: Scheduled to be completed December 1992.

74. Complete "saltcrete" laboratory analyses at Rocky Flats.
Status: Completed.

75. Complete draft waste and residue characterization studies at Rocky Flats.
Status: Completed.

76. Issue Waste Minimization Plan for Rocky Flats.
Status: Completed.

77. Ship as much "poncrete" as possible to NTS from RF by May 8, 1990.
Status: Completed.

78. Upgrade sitewide UST system for LBL.
Status: Partially met.

79. LLNL will be investigated by a DOE Tiger Team in April 1990.
Status: Completed. Progress has been made in responding to Tiger Team Findings.

80. Complete construction of ITP facilities at SRS.
Status: Will be completed fourth quarter FY 1991.

CORRECTIVE ACTIVITIES

1. Submit NPDES permit reapplication from Albuquerque Field Office.
Status: Completed.

2. Upgrade Liquid Waste Storage Facility at Pinellas Plant.
Status: Completed.

3. Complete UST removal and associated remediation at Pinellas Plant.
Status: USTs removed - remediation ongoing.

4. Procure and install RCRA storage units at Pantex Plant.
Status: Installation scheduled for completion July 1991.

5. Construct RCRA Waste Staging Facility at Pantex Plant.
   Status: Design scheduled for completion July 1991.

6. Begin construction of spill containment and installation of storage tank at Mound Plant.
   Status: Completed. (Design in progress - 60 percent complete.)

7. Complete Precious Metals Processing Area upgrades at Kansas City Plant.
   Status: Completed.

8. Anticipate completion of Design Phase of Flood Protection Improvements at Kansas City Plant.
   Status: Still in design phase.

9. Phase out fluoride-generating process at Kansas City Plant.
   Status: Completed.

10. Complete repair and sealing of waste management storage lots at Kansas City Plant.
    Status: Completed design.

11. Complete relining of the 001 Main Trunk at Kansas City Plant.
    Status: Completed.

12. Submit LANL NPDES Permit reapplication.
    Status: Discussion under way.

13. Complete construction of satellite sewer monitoring system stations at LLNL.
    Status: In process.

14. Procure RCRA-compliant storage units for Pantex Plant.
    Status: Completed.

15. Design and construct effluent discharge holding systems for high explosives and laboratory facilities at Pantex Plant.
    Status: Construction completion estimated July 1992.

16. Install waste treatment equipment at high-explosive fabrication facilities at Pantex Plant.
    Status: Construction completion estimated July 1992.

17. Complete replacement of tanks and installation of tank monitoring systems on USTs at Pantex Plant.
    Status: Replacement and modification completion estimated October 1991.

18. Construct adequate containment structure for the liquid storage facility at Pinellas Plant.
    Status: Completed.

19. Remove UST and clean up soil and groundwater as necessary at Pinellas Plant.
Status: USTs removed, and remediation is ongoing.

20. Replace one liquid solvent waste storage tank at Pinellas Plant.
Status: Ongoing.

21. Complete Liquid Waste Storage Facility upgrade at Pinellas Plant.
Status: Completed.

22. Complete Neutralization Facility upgrades at Pinellas Plant.
Status: Completed.

23. Complete construction of TA III sewer line at SNL.
Status: Completion estimated May 1991.

24. Remove, replace and upgrade USTs at Chicago Field Office.
Status: UST removal/upgrade activity still underway at Chicago Field Office installations. Leak detection systems for tanks at ANL-W will not be complete until FY 1992; at BNL 7 tanks containing sludge to be removed in FY 1991 and FY 1992; at PPPL, tanks have been removed and remediation initiated.

25. Complete construction for treatment of boiler house areas wastewater at ANL-E.
Status: Construction began in FY 1990 and will be completed in FY 1993.

26. Complete ongoing assessment and/or cleanup of pollutant spills/releases at Fermi, ANL-E, and ANL-W.
Status: Cleanup of contamination ongoing at all Chicago Field Office installations.

27. Issue draft Waste Characterization Implementation Planning Document from Idaho Field Office.
Status: The draft plan was issued to DOE-ID in February 1991. The plan has been sent to DOE-HQ for review.

28. Complete facility upgrade priority list for Idaho Field Office.
Status: The facility upgrade priority list was completed in second quarter of FY 1990 and since that time has been updated and made current on a regular basis as facility upgrades are completed and removed from the list.

29. Complete Phase I Environmental Corrective Activities at Idaho Field Office.
Status: The Phase 1 Environmental Corrective Activities were complete by the end of FY 1990 with the corrections complete to restart custom fuel operations.

30. Complete Draft Groundwater Monitoring Implementation Plant for Idaho Field Office.
Status: This Draft Implementation Plan was prepared and issued at the start of FY 1991. In November 1990 the Plan was expanded at the request of the State of Idaho to include all wells on the INEL. The Plan was renamed the Comprehensive Well Survey.

31. Complete installation of potable water system protection at Nevada Field Office. (1991)
Status: Project has been initiated, survey of buildings to be retrofitted continues.

32. Upgrade existing sewage systems at Nevada Field Office.
Status: Upgrade of sewage systems is continuing.

33. Complete upgrade and construction of steam cleaning facilities at Nevada Field Office. (1991)
Status: Engineering is complete for three of the four facilities, while the fourth is still being engineered.

34. Complete construction of Area 6 decontamination pond at Nevada Field Office.
Status: Sampling of the soil column has delayed until construction of the new facility.

35. Attain FFCA compliance for nonradiological wastewater treatment plants at ORNL.
Status: Completed March 31, 1990.

36. Start design of PCB Control Improvements at PORTS.
Status: In process.

37. Complete design of Waste Pit Area Stormwater Runoff Control at FMPC.
Status: Completed January 11, 1990.

38. Complete design for the Bethel Valley LLLW-LAT System Update Project at Oak Ridge.
Status: Original date for detailed design was June 30, 1990; a request submitted to extend date to January 31, 1991; detailed design submitted on January 31, 1991.

39. Complete installation of Boiler No. 8 at Oak Ridge K-25 Site.
Status: Completed March 4, 1991; awaiting Readiness Review Board before initiating operation.

40. Attain compliance for nonradiological waste water treatment plants at ORNL.
Status: Operated in compliance with NPDES permit during FY 1990.

41. Complete construction of the dry fly ash handling and collection system at Oak Ridge Y-12 Plant.
Status: Completed April 12, 1990.

42. Complete closure of classified landfill at PGDP.
Status: Funding not approved for FY 1992 budget.

43. Complete installation of cathodic protection system for waste management facilities at Richland Field Office.
Status: The cathodic protection system for waste management facilities was temporarily placed on hold in FY 1990. It has recently been restarted, but a new completion date has not yet been determined.

44. Complete construction of Phase I of solid radioactive mixed waste storage facilities at Richland Field Office.
    Status: Construction of Phase I mixed waste storage facilities was completed in FY 1990.

45. Initiate upgrades to the wastewater treatment facilities at Rocky Flats to ensure compliance with permit conditions.
    Status: Completed.

46. Complete Sewer Diversion System for Lawrence Livermore National Laboratory (LLNL).
    Status: Completed. To be activated summer 1991.

47. Complete sewer pipe rehabilitation and cross connection for LLNL.
    Status: Not completed. This is a FY 1992 line item.

48. Complete UST construction at Lawrence Berkeley Laboratory.
    Status: UST construction has been divided into two phases. Phase I was started in FY 1989, and two of the four tanks were completed. The remaining tanks went into Phase II and $200K is needed in FY 1993 to complete.

49. Depending on funds, complete containment lines for the Plating Shop at Stanford Linear Accelerator Center (SLAC).
    Status: Scheduled to be completed in December 1991.

APPENDIX E

COMMENTS RECEIVED

ON

FY 1993-1997 PREDECISIONAL DRAFT

EXTERNAL COMMENTS RECEIVED ON PREDECISIONAL DRAFT

INTRODUCTION

The predecisional draft of the third Five-Year Plan was reviewed by DOE offices as well as external organizations. As a result of their input, the Plan was substantially revised and restructured. Organizations within DOE that reviewed and commented on the draft included the Office of Environment, Safety, and Health; the Office of General Counsel; the Office of New Production Reactors; and the Office of Financial Management and Controller. Within EM, the draft was reviewed by the three program offices, Waste Operations, Environmental Restoration, and Technology Development, as well as by the field offices. The reviews addressed technical issues as well as the style and consistency of individual modules.

To make the Five-Year Plan more readable and understandable to the general public, EM asked a high school science teacher to review a predecisional draft. Areas within the Five-Year Plan requiring better explanations were identified. Other comments focused on programmatic and policy issues such as siting and retraining. These comments were factored into the final Five-Year Plan.

Consistent with EM's commitment to facilitating early public involvement in the 5-year planning process, EM asked both the State and Tribal Government Working Group (STGWG) and the Stakeholders' Forum to review the draft of the third Five-Year Plan. STGWG is comprised of participants from 16 States, three northwestern Indian Tribes, and three associations representing State government associations. The Stakeholders' Forum is comprised of interested parties representing Indian Tribal organizations, congressional staff, trade unions, other Federal agencies (including Office of Management and Budget, Nuclear Regulatory Commission, and Office of Technology Assessment), education associations, environmental and public interest groups, professional and technical societies, and industry. The purpose of the Stakeholders' Forum is to provide a wide range of interested parties with the opportunity to review the Plan prior to publication and to communicate directly with DOE.

The majority of the comments made by STGWG and Stakeholders' Forum members fall into nine broad categories:

- Structure and organization of the Plan,
- Commitment to the 30-year goal and accomplishment tracking,
- Priorities and funding,
- Public involvement in the planning process,
- Technology issues,
- Indian Tribal concerns,
- Education and training,
- Work force safety, and
- Coordination within EM.

This appendix highlights the concerns expressed by the individual STGWG and Stakeholders' Forum members in these nine areas.

STRUCTURE AND ORGANIZATION OF THE PLAN

The FY 1993-1997 Five-Year Plan has been substantially restructured and reworked to incorporate comments received on the draft. Several items have been added that did not appear in the draft. A transmittal letter from Secretary Watkins begins this Plan. The Plan now includes an Executive Summary, which highlights the major accomplishments and future direction of the EM Program. It also includes an expanded introduction and a section entitled "How This Plan was Developed" to better guide the reader through the document.

The first section of this Five-Year Plan has been restructured, and new material has been added to place greater emphasis on both accomplishments and commitments in response to STGWG's concern that it be a more positive document. For example, a section on the Office of Technology Assessment's report, *Complex Cleanup*, has been added. Text and graphics have been modified throughout to incorporate comments by STGWG, Stakeholders' Forum, and DOE (both EM and other offices, such as General Counsel) reviewers. The result should be a more user friendly, less redundant, and more accessible document.

As currently constituted, the Five-Year Plan serves many audiences. The Plan details the results of EM's planning process and thereby serves DOE Headquarters and field personnel as they plan, budget, and execute the EM Program. It serves as a communications tool to numerous external audiences with varying needs, among them STGWG, Congress, and public interest groups. As a result, the Five-Year Plan contains information at several levels of detail, ranging from background information about the program to specific data about activities at particular sites.

COMMITMENT TO THE 30-YEAR GOAL AND ACCOMPLISHMENT TRACKING

Both STGWG and Stakeholders felt that the Five-Year Plan needed to reflect a stronger commitment to the 30-year goal and more clearly present the status of commitments and accomplishments. The Five-Year Plan has been restructured to put greater emphasis on these areas. For example, the Five-Year Plan includes an Executive Summary which broadly reports past accomplishments and future directions. DOE's commitment to its 30-year cleanup goal is reaffirmed in both the Executive Summary and in the new introduction to the Plan. Section 1 discusses program progress to date and presents a progress chart of expected milestones for FY 1993-1997. In addition, the Installation Summaries (Section 3) discuss both accomplishments to date and future milestones.

In order to respond to the concerns regarding accomplishment tracking, two appendixes have been added. Appendix B lists agreements and provides information regarding their status. Appendix D provides the status of commitments made in the FY 1992-1996 Five-Year Plan, referencing them as either completed or indicating the expected date of completion. In addition, EM is developing a progress tracking system, expected to be operational by October 1991, that will systematically monitor the status of program milestones. This system will not only link information on planning, budget, and program execution, but will also serve as a diagnostic and monitoring tool for management and provide data for responses to public inquiries. When it becomes operational, the tracking system will be a major tool that will help provide the necessary information to respond to the concerns expressed by both STGWG and the Stakeholders.

PRIORITIES AND FUNDING

In response to Stakeholders' Forum comments that this section was confusing, the module on prioritization has been revised. Information not related to the four-level interim priority system was removed and is described in Section 2. In recognition of the importance of this topic, priority setting procedures are discussed in Section 1.1.1, in addition to specific sections on prioritization.

Also, in response to comments made by the Stakeholders' Forum, prioritization puts greater emphasis on risk-based systems. Such a risk-based prioritization system will use site characterization data rather than records of contamination. The need for these data and a realistic appraisal of when a risk-based priority system may be implemented have also been added to the Plan.

Stakeholders also commented that the prioritization process needs to be linked to the budget process. Additional information has been added (Section 1.1.1) describing the development of funding scenarios and their relationship to priority setting. In short, EM uses its four-tiered priority categories to determine which activities should receive funding first.

PUBLIC INVOLVEMENT

Both STGWG and Stakeholders' Forum commented that DOE's process for public involvement in the Five-Year Plan needed improvement. The greatest area for improvement noted was to increase public participation opportunities at the local, site level.

EM recognizes that public participation is a key element to achieving success in its program. As a relatively new organization within DOE, EM has worked to expand opportunities for early public involvement in planning. EM is committed to a DOE culture founded on the principles of openness, responsiveness, and accountability.

EM facilitates public involvement by holding early public meetings during the development of basic input into the Five-Year Plan, by scheduling formal reviews of the draft Five-Year Plan by STGWG and the Stakeholders' Forum, and by ensuring that public comments on the previous Five-Year Plan are responded to in the subsequent Five-Year Plan. Public comments on Site-Specific Plans influence future site-specific and general 5-year planning processes.

This year, public meetings were held in March 1991 near the start of the FY 1993-1997 Five-Year Plan development process. These public meetings had three purposes: (1) to explain to the public and regulators how EM priority systems work and how the field offices conducted their initial evaluation and ranking of Activity Data Sheets (ADSs); (2) to allow regulators and the public to review the ADSs and determine whether these priorities were consistent with their concerns; and (3) to incorporate these comments into the development of both the next Five-Year Plan and the budget request for FY 1993. The success of these meetings varied from site to site as measured by the numbers of citizens attending the meetings. EM intends to increase the level of participation through better publicity and premeeting planning.

STGWG held its tenth meeting May 15-17, 1991. The purpose of this meeting was to provide comments on the predecisional draft of this third Five-Year Plan. The Stakeholders' Forum, which was held May 19-21, 1991, was also very useful in providing feedback to DOE on the draft of the third Five-Year Plan. STGWG and Stakeholders' Forum meetings are concrete examples of EM's support for early public participation in 5-year program planning and decision making at the national level.

What this year's Plan does not illustrate are the numerous local, site-specific activities conducted by DOE field offices for public participation. A great deal of activity takes place at the local level to communicate to and involve local citizens who live near DOE facilities. A new module will be added to the fourth Five-Year Plan to ensure that both national and local public participation activities are featured.

TECHNOLOGY ISSUES

EM's commitment to technology development as a means of enabling an integrated approach to waste minimization, characterization, and destruction is emphasized throughout the Five-Year Plan. The strategy for implementation, rather than being overarching as suggested, is directed toward motivating specific members of the user community to adopt and apply new technology. There is substantial involvement of potential users in the identification of needs and in participation in Integrated Demonstrations.

EM believes that this user-oriented approach to implementation will achieve the most rapid acceptance and effective application of new technologies. The Integrated Demonstrations themselves are intended to represent a complete systems approach that will take advantage of outside technical oversight to ensure that the end product is indeed ready for implementation. The Stakeholders commented that the lack of a national standard for "how clean is clean" makes technology development, transfer, and use difficult. DOE has long recognized this problem, and agrees completely with the Stakeholders' Forum view. Standards for "how clean is clean" require a basis for comparison of cleanliness to other concerns. Until a methodology for comparing the risk of some level of contamination to other risks and to the required cost for remediation, there will not be a basis for deciding how clean is clean. Without such a basis, decisions tend to be made based on the lowest limits of detection of analytical instrumentation. Any detectable level of contamination raises concern, whether or not there is significant risk.

Stakeholders commented that the Five-Year Plan needs to specify how technology developed in industry and academia will be transferred to meet DOE needs. The Technology Integration Program is designed to facilitate this transfer of technology and is discussed in Section 2.4.6.3.1 and the Technology Integration Summaries are discussed in Section 3.

TRIBAL ISSUES

DOE is committed to carrying out its programs in a manner that ensures protection of and that does not adversely affect the environment or natural resources of American Indian Tribes, their reservations, or ceded lands. In this Plan, DOE expresses a stronger commitment to protecting the rights afforded to Indian Nations, as well as greater involvement of Indian Tribes whose lands and rights are affected by DOE activities.

In keeping with the trust relationship between the Federal government and Indian Nations, DOE will consult with potentially affected Indian Tribes to ensure that protection of the environment means more than simply complying with environmental regulations. With respect to discussions in the Five-Year Plan as noted by STGWG and Stakeholders, Indian Nations or governments will be so-called to reflect their unique status. Only if a group represents an Indian organization will it be called a "Tribal group."

Rights emanating from treaties between Indian Nations and the Federal government form the basis for the relationship between DOE and the affected Indian Tribes. In addition to the fundamental treaty rights, religious freedom and cultural resource protection laws and Federal environmental laws govern interactions between DOE and Indian Tribes. Language has been added to this Plan to ensure that this relationship is clearly stated.

EDUCATION AND TRAINING

One of the primary missions of the Environmental Education and Development (EED) Branch of EM's Office of Technology Development is to develop programs to retrain the current EM work force and to attract and educate the next generation of scientists, engineers, technicians, and others needed to help achieve the 30-year compliance and cleanup goal. DOE recognizes the need to increase the participation of women and minorities, a population that will constitute about two-thirds of the entering national work force by the year 2000.

The EED Branch is considering the many comments from the Stakeholders' Forum on education. Included in these were suggestions that DOE develop a curriculum with specific goals and objectives, as well as provide support materials and in-service training for teachers. The Stakeholders also suggested that the EM Program include college training in the environmental area for future K-12 teachers and that college education programs extend to 2-year degree programs and give undergraduates opportunities for hands-on research.

Some programs are already under way to retrain the DOE work force, especially as DOE moves from a production mission to an environmental mission. These programs are explained in the EED Strategic Program Plan. To identify work force assessment including work force knowledge, skills, and requirements needs at all levels, EM is currently conducting a top-down and bottom-up needs assessment survey. By 1992, the survey will give EM sufficient information about both the demand and supply sides, not only in terms of numbers but also in terms of skills mix and education/training requirements needed to perform all EM-related jobs. The information, to be updated annually, will provide a foundation for EM education and development planning.

WORK FORCE SAFETY

Environmental, safety, and health programs and performance apply to all EM operations. These include controlling air, water, and soil pollution; limiting the risks to the well-being of both operating personnel and the general public to acceptable low levels; and adequately protecting property against accidental loss and damage.

Stakeholders commented that the Five-Year Plan should place greater emphasis on the health and safety concerns of the work force and community. The Five-Year Plan has been reworked to address this concern. To demonstrate its commitment in this area, EM has adopted regulations, standards, and protocols from Federal, State, and local agencies, national consensus standards endorsed by DOE Orders, and special interest agreements regarding work force safety.

Within the EM organization, typical health and safety functions include environmental protection, including sampling and analysis of environmental media, and process and facilities safety such as effluent monitoring. Occupational safety and health, fire protection, industrial hygiene, health physics, and occupational medicine are some of the major components of EM's programs to ensure worker safety. Nuclear safety, emergency preparedness, quality assurance, and radiological and hazardous waste management are the other major functional areas in EM's health and safety programs. In addition, training programs, including performance-based training, are instituted to instill personnel with the knowledge necessary to reinforce health and safety practices with job functions.

In addition to EM activities, the Office of Health under the Assistant Secretary for Environment, Safety and Health was created to provide a Departmental focal point for all health-related activities. This Office, through its Office of Epidemiology and Health Surveillance (OEHS), provides for independent assessments of potential health effects among workers and members of the public as part of a Memorandum of Understanding with the Department of Health and Human Services. In addition, OEHS has scientific staff to investigate suspected disease clusters among workers and the public, implement a Departmentwide occupational health surveillance system, and disseminate health-effects information to all interested parties.

COORDINATION WITHIN EM

EM consists of five major subprograms: Corrective Activities, Waste Operations, Environmental Restoration, Technology Development, and Transportation. Program managers clearly recognize that these subprograms are not independent but rather are interdependent parts of the overall EM Program, sharing its overall goals and objectives.

EM is headed by its Director, Leo P. Duffy, and Deputy Director, Paul D. Grimm. Organizationally, the next tier of management consists of the five Associate Directors. The Associate Directors work very closely and confer often before making decisions that could affect parallel activities.

The Waste Operations Program recognizes that, in the future, the Environmental Restoration Program will likely be the largest generator of waste needing treatment, storage, and/or disposal. Therefore, the Environmental Restoration Program involves Waste Operations in its planning activities to ensure that the necessary facilities are available when needed. Technology Development exists solely to meet the programmatic needs of the other major subprograms. The Corrective Activities and Transportation subprograms support the other subprograms and DOE operations in general and must remain aware of their operational needs and compliance status.

DOE Headquarters fosters this corporate view of the program through Five-Year Plan development and by emphasizing the overall goals and objectives of the program in field program reviews, in Headquarters comments on the Site-Specific Plans, in weekly conference calls, and in bimonthly meetings between Headquarters and field. Supplemental guidance is also issued whenever there is the need for redirection.

In a program this vast, there is admittedly a danger of losing sight of the overall program objectives, including the 30-year cleanup goal. Nevertheless, the program remains faithful to this goal and actively retains it as a fundamental planning criterion.

APPENDIX F

ACTIVITY DATA SHEETS

ACTIVITY DATA SHEETS
SORTED BY FIELD OFFICE, INSTALLATION, AND CATEGORY
(dollars in thousands)

ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
FIELD OFFICE: AL INSTALLATION: ALBUQUERQUE OPERATIONS CATEGORY: ER					
ALAL-12-A	DOE/STATE OF TEXAS AGREEMENT IN PRINCIPLE	1,056	1,040	1,056	1,040
ALAL- 15-A	DOE/STATE OF FLORIDA AGREEMENT IN PRINCIPLE	83	87	83	87
ALAL- 17-	ER PROGRAM SUPPORT	7,234	5,614	7,234	5,614
ALAL- 17-A1	ER PROGRAM SUPPORT	0	0	0	0
ALAL-1001-	SOUTH VALLEY SUPERFUND SITE REM (AL-SV-1)	2,064	872	2,064	872
Subtotal AL, ALBUQUERQUE OPERATIONS, ER		10,437	7,613	10,437	7,613
FIELD OFFICE: AL INSTALLATION: ALBUQUERQUE OPERATIONS CATEGORY: WM					
ALAL-	2-BASE WASTE MGT - PROGRAM MANAGEMENT SUPPORT	240	1,700	240	1,700
ALAL- 11-	DOE/STATE OF NEW MEXICO AGREEMENT IN PRINCIP	0	3,125	0	3,125
ALAL- 12-	DOE/STATE OF TEXAS AGREEMENT IN PRINCIPLE	0	0	0	0
ALAL- 15-	DOE/STATE OF FLORIDA AGREEMENT IN PRINCIPLE	0	0	0	0
Subtotal AL, ALBUQUERQUE OPERATIONS, WM		240	4,825	240	4,825
Subtotal AL, ALBUQUERQUE OPERATIONS		10,677	12,438	10,677	12,438
FIELD OFFICE: AL INSTALLATION: IT RESEARCH INSTITUTE CATEGORY: CA					
ALIT- 13-	CONSTRUCTION OF SEWER LINE TO CITY POTW	103	0	103	0
ALIT- 14-	REPLACE UNDERGROUND FUEL OIL STOR. TANKS AND	0	0	0	0
Subtotal AL, IT RESEARCH INSTITUTE, CA		103	0	103	0
FIELD OFFICE: AL INSTALLATION: IT RESEARCH INSTITUTE CATEGORY: ER					
ALIT-1013-	DIESEL OIL RELEASE ASSESSMENT (AL-IT-3)	770	380	770	380
ALIT-1014-	DIESEL OIL RELEASE REMEDIATION (AL-IT-3)	175	26	175	246
ALIT-1015-	HOT POND ASSESSMENT (AL-IT-4)	600	225	600	225
ALIT-1016-	HOT POND REMEDIATION (AL-IT-4-2)	0	0	0	300
ALIT-1018-	NITRATES GROUNDWATER ASSESSMENT (AL-IT-2)	915	1,470	915	870
ALIT-1019-	NITRATES IN GROUND WATER REMEDIATION (AL-IT-	0	20	0	100
ALIT-1020-	ENVIRONMENTAL ASSESSMENT PROGRAM MANAGEMENT	400	408	400	408
ALIT-1021-	SANITARY LAGOONS ASSESSMENT (AL-IT-1)	1,380	100	1,380	100
ALIT-1022-	SANITARY SEWAGE LAGOONS REMEDIATION (AL-IT-1	0	0	0	0
ALIT-1023-	ENVIRONMENTAL REMEDIATION PROGRAM MANAGEMENT	100	104	100	104
Subtotal AL, IT RESEARCH INSTITUTE, ER		4,340	2,733	4,340	2,733
FIELD OFFICE: AL INSTALLATION: IT RESEARCH INSTITUTE CATEGORY: WM					
ALIT-3047-	BASE PROGRAM	142	149	142	149
ALIT-3060-	WASTE TREATMENT	101	110	101	110
ALIT-3070-	WASTE STORAGE	43	46	43	46
ALIT-3080-	WASTE DISPOSAL	121	125	121	125
ALIT-3090-	WASTE MINIMIZATION	18	19	18	19
ALIT-3265-	ADD'N/UPGRADE TO WASTE TREATMENT BLDG	468	0	468	0
Subtotal AL, IT RESEARCH INSTITUTE, WM		893	449	893	449
Subtotal AL, IT RESEARCH INSTITUTE		5,336	3,182	5,336	3,182
FIELD OFFICE: AL INSTALLATION: KANSAS CITY PLANT CATEGORY: CA					
ALKC- 17-	NPDES SEWER SYSTEMS	316	329	316	329
ALKC- 23-	FLOOD PROTECTION IMPROVEMENTS	3,824	2,407	3,824	2,407
ALKC- 28-	REPAIR & SEAL STORAGE LOTS	0	0	0	0
Subtotal AL, KANSAS CITY PLANT, CA		4,140	2,736	4,140	2,736
FIELD OFFICE: AL INSTALLATION: KANSAS CITY PLANT CATEGORY: ER					
ALKC-1020-	ENVIRONMENTAL RESTORATION MANAGEMENT	302	380	302	380
ALKC-1022-	ENVIRONMENTAL RESTORATION MANAGEMENT	700	875	700	875
ALKC-1024-	ABANDONED INDIAN CREEK OUTFALL REM. (AL-KC-2	9,759	146	9,759	146
ALKC-1025-	CLASSIFIED WASTE TRENCH AREA REM. (AL-KC-5-1	0	0	0	0
ALKC-1026-	CLASSIFIED WASTE TRENCH ASSESSMENT (AL-KC-5-	0	143	0	143
ALKC-1027-	DEPT. 26 ASSESSMENT (AL-KC-4-2)	497	100	497	98
ALKC-1028-	DEPT. 26 REMEDIATION (AL-KC-4-2)	0	0	0	2
ALKC-1029-	DEPT. 27 ASSESSMENT (AL-KC-4-3)	0	776	0	776
ALKC-1030-A	DEPT. 27 OUTSIDE REMEDIATION	119	1,952	119	1,952
ALKC-1030-B	DEPT. 27 INSIDE REMEDIATION	0	0	0	0

ACTIVITY DATA SHEETS
SORTED BY FIELD OFFICE, INSTALLATION, AND CATEGORY
(dollars in thousands)

ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
ALKC-1031-	MISCEL. CONT. SITES SOILS ASSESSMENT (AL-KC-	955	284	955	284
ALKC-1032-	MISCELLANEOUS CONTAMINATED SOILS REMEDIATION	0	0	0	0
ALKC-1034-	MISCELLANEOUS PCB SITES REMEDIATION (AL-KC-4	0	62	0	62
ALKC-1035-	NE AREA G.W. REMEDIATION	388	1,270	388	1,270
ALKC-1036-	NEPA ENVIRONMENTAL ASSESSMENT	500	529	500	529
ALKC-1037-	OUTFALL 001 RACEWAY & R. POND ASSESS. (AL-KC	363	92	363	92
ALKC-1038-	OUTFALL 001 RACEWAY & RETEN POND REM (AL-KC-	0	0	0	0
ALKC-1040-	PLATING BUILDING ASSESSMENT (AL-KC-4-1)	215	69	215	69
ALKC-1041-B	PLATING BUILDING PHASE 3 (AL-KC-4-1)	0	16	0	16
ALKC-1042-	RCRA SO. LAGOON CLOSURE G.W. RESTOR (AL-KC-R	1	149	1	149
ALKC-1043-	RCRA SOUTH LAGOON G.W. ASSESSMENT (AL-KC-RC-	123	0	123	0
ALKC-1044-	GROUNDWATER TREATMENT & MONITORING	1,048	738	1,048	738
ALKC-1046-	TCE STILL AREA SOILS ASSESSMENT (AL-KC-5-2)	751	146	751	146
ALKC-1047-	TCE STILL AREA SOILS REMEDIATION (AL-KC-5-2)	0	0	0	0
ALKC-1048-	DEPT. 71 AND TRUCK SHOP SUMP	0	208	0	208
ALKC-1049-	D/71 & TRUCK SHOP SUMP	0	0	0	0
ALKC-1050-	NORTHEAST AREA ASSESSMENT	127	0	127	0
Subtotal AL, KANSAS CITY PLANT, ER		15,848	7,935	15,848	7,935
FIELD OFFICE: AL INSTALLATION: KANSAS CITY PLANT CATEGORY: WM					
ALKC- 21-	ELIMINATE TTO'S FROM INDUSTRIAL AND SANITARY	0	0	0	0
ALKC- 25-	PROTECTION OF WASTE MANAGEMENT STORAGE AREAS	276	0	276	0
ALKC-3047-	CONTINUITY OF OPERATIONS	211	284	211	284
ALKC-3048-	BASE PROGRAM FOR HAZARDOUS WASTE DISPOSAL	3,645	3,817	3,645	3,817
ALKC-3049-	BASE PROGRAM FOR HAZ WASTE STORAGE & ASSOC A	1,647	1,645	1,647	1,645
ALKC-3053-	RAD & MIXED WASTE DISPOSAL & BASE PROGRAM	18	0	18	0
ALKC-3054-	RAD & MIXED WASTE OPERATIONS & STORAGE BASE	26	32	26	32
ALKC-3238-	HAZARDOUS WASTE MINIMIZATION/POLLUTION PREVE	222	245	222	245
ALKC-3274-	ROOFING OVER BARREL LOT	0	0	0	0
ALKC-3275-	BASE PROGRAM FOR WASTE TREATMENT OPERATIONS	1,888	1,037	1,888	1,037
Subtotal AL, KANSAS CITY PLANT, WM		7,933	7,060	7,933	7,060
Subtotal AL, KANSAS CITY PLANT		27,921	17,731	27,921	17,731
FIELD OFFICE: AL INSTALLATION: LOS ALAMOS LABORATORY CATEGORY: CA					
ALLA- 42-	HAZARDOUS WASTE TREATMENT FACILITY	6,115	6,315	6,115	6,315
ALLA- 43-	CENTRALIZED HIGH EXPLOSIVE (HE) WASTEWATER F	250	0	250	0
ALLA- 49-	REPLACE PCB TRANSFORMERS AND CAPACITORS	3,000	0	3,000	0
ALLA- 51-	SANITARY WASTEWATER SYSTEMS CONSOLIDATION	1,546	1,000	1,546	1,000
ALLA- 55-	UNDERGROUND STORAGE TANKS	783	0	783	0
ALLA- 70-	WATER SUPPLY SYSTEM/CROSS CONNECTION CONTROL	500	200	500	200
ALLA- 74-	NEW STACK AT LAMPF	3,505	0	3,505	0
ALLA- 80-	CWA PROJECTS	3,400	2,500	3,400	2,500
ALLA-3263-	RCRA ACTIVE FIRING SITES	466	365	466	365
Subtotal AL, LOS ALAMOS LABORATORY, CA		19,565	10,380	19,565	10,380
FIELD OFFICE: AL INSTALLATION: LOS ALAMOS LABORATORY CATEGORY: ER					
ALLA-1049-	CANYONS ASSESSMENT (AL-LA-1)	100	290	100	380
ALLA-1050-B	SURVEILLANCE & MAINTENANCE FOR NON-DP ACTIVI	0	182	0	182
ALLA-1051-	D&D PROGRAM, DP FACILITIES	1,030	1,329	1,030	726
ALLA-1051-B	D&D PROGRAM, NON-DP FACILITIES	0	363	0	363
ALLA-1053-A	ASSESSMENT PHASE OF LAPRE REACTOR DECOMMISSI	0	0	0	0
ALLA-1054-	ASSESSMENT, PHASE SEPARATOR PIT DECOMMISSION	0	537	0	537
ALLA-1055-	ASSESSMENT, TA-21 BLDG 3 & 4 SOUTH DECOMMISS	300	0	300	0
ALLA-1056-	ASSESSMENT PHASE, CMR WING 9 DECOMMISSIONING	0	0	0	0
ALLA-1062-	INTERIM REMEDIAL MEASURES ASSESSMENT (AL-LA-	5,000	3,820	5,000	5,000
ALLA-1063-	INTERIM REMEDIAL MEASURES REMED.(AL-LA-57)	4,500	2,215	4,500	2,900
ALLA-1066-	NEPA DOCUMENTATION ASSESSMENT (AL-LA-59)	1,825	941	1,825	1,232
ALLA-1067-	RCRA MIXED WASTE STORAGE/DISPOSAL FAC.(AL-LA	1,986	1,692	1,986	2,215
ALLA-1070-	SURVEILLANCE & MAINTENANCE FOR DEFENSE ACTIV	0	0	0	0
ALLA-1071-	TA-0, 19, 26, 73, 74 ASSESSMENT (AL-LA-25)	1,151	5,542	1,151	7,254

ACTIVITY DATA SHEETS
SORTED BY FIELD OFFICE, INSTALLATION, AND CATEGORY
(dollars in thousands)

ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
ALLA-1078-	TA-1 ASSESS (AL-LA-11)	599	1,581	599	2,070
ALLA-1079-	TA-10,31,32,45 ASSESSMENT (AL-LA-15)	66	1,738	66	2,275
ALLA-1082-	TA-11,13,16,24,25,28,37 ASSESS (AL-LA-12)	2,334	106	2,334	139
ALLA-1085-	TA-12,14,67 ASSESSMENT (AL-LA-54)	0	687	0	900
ALLA-1086-	TA-15 ASSESSMENT (AL-LA-23)	1,776	75	1,776	98
ALLA-1093-	TA-18, 27, 65 ASSESSMENT (AL-LA-18)	1,167	53	1,167	69
ALLA-1098-	TA-2, 41 ASSESSMENT (AL-LA-42)	902	265	902	347
ALLA-1100-	TA-20, 53, 72 ASSESSMENT (AL-LA-34)	0	1,032	0	1,350
ALLA-1106-	TA-21 ASSESSMENT (AL-LA-9)	4,051	3,811	4,051	4,988
ALLA-1111-	TA-6,7,22,40,58,62 ASSESSMENT (AL-LA-30)	2,775	610	2,775	798
ALLA-1114-	TA-3,59,60, 61, 64 ASSESSMENT (AL-LA-20)	2,334	106	2,334	139
ALLA-1122-	TA-33 ASSESSMENT (AL-LA-3)	270	3,098	270	4,056
ALLA-1127-	TA-35 WASTE OIL STORAGE PIT ETC. REM. (AL-LA	0	0	0	0
ALLA-1129-	TA-4,5,35,42,48,52,55,63,66 ASSESSMENT (AL-L	1,131	4,396	1,131	5,754
ALLA-1130-	TA-36,68,71 ASSESSMENT (AL-LA-39)	583	26	583	35
ALLA-1132-	TA-39 ASSESSMENT (AL-LA-48)	583	26	583	35
ALLA-1135-	TA-40 SCRAP DETONA. SITE CLOSURE REM. (AL-LA	77	0	77	0
ALLA-1136-	TA-43 ASSESSMENT (AL-LA-50)	0	132	0	173
ALLA-1140-	TA-46 ASSESSMENT (AL-LA-33)	583	27	583	35
ALLA-1144-	TA-49 ASSESSMENT (AL-LA-51)	33	541	33	709
ALLA-1147-	TA-50 ASSESSMENT (AL-LA-5)	36	1,679	36	2,197
ALLA-1148-	TA-51, 54 ASSESSMENT (AL-LA-55)	1,319	6,548	1,319	8,570
ALLA-1150-	TA-54 AREA L WASTE OIL TANKS REMED. (AL-L	0	0	0	0
ALLA-1154-	TA-57 ASSESSMENT (AL-LA-56)	0	132	0	173
ALLA-1157-	TA-8,9,23,69 ASSESSMENT (AL-LA-36)	1,776	75	1,776	98
ALLA-2105-	PROGRAMMATIC TECH. SUPPORT ASSESSMENT (AL-LA	13,295	13,333	13,295	14,751
ALLA-2106-	PROGRAMMATIC MANAGEMENT REMEDIATION	500	382	500	500
ALLA-2107-	PROGRAMMATIC MANAGEMENT ASSESSMENT (AL-LA-61	6,020	5,226	6,020	6,841
ALLA-2110-	ENVIRONMENTAL ANALYTICAL CHEMISTRY FACILITY	3,652	8,485	3,652	13,806
ALLA-2111-	ASSESSMENT PHASE OF D&D OF WING 1, CMR BUILD	0	0	0	182
ALLA-2112-	ASSESSMENT PHASE FOR D&D OF WING 2, CMR BUIL	0	0	0	182
ALLA-2113-	ASSESSMENT PHASE FOR D&D OF WING 4, CMR BUIL	0	0	0	182
ALLA-2121-	REMEDIATION, PHASE SEPARATOR PIT DECOMMISSIO	0	870	0	1,202
ALLA-2122-	REMEDIATION, TA-21 BLDG 3 & 4 SOUTH DECOMMIS	1,201	2,602	1,201	2,573
ALLA-2123-	REMEDIATION PHASE, CMR WING 9 DECOMMISSIONIN	0	0	0	0
ALLA-2124-	REMEDIATION PHASE FOR D&D OF WING 1, CMR BUI	0	0	0	0
ALLA-2125-	REMEDIATION PHASE FOR D&D OF WING 2, CMR BUI	0	0	0	0
ALLA-2126-	REMEDIATION PHASE, D&D OF WING 4, CMR BUILDI	0	0	0	0
Subtotal AL, LOS ALAMOS LABORATORY, ER		62,955	74,553	62,955	96,016
FIELD OFFICE: AL INSTALLATION: LOS ALAMOS LABORATORY CATEGORY: WM					
ALLA- 43-A	HIGH EXPLOSIVE (HE) WASTEWATER TREATMENT SYS	0	0	0	195
ALLA-3056-	HAZARDOUS & TOXIC WASTE DISPOSAL	1,850	1,475	1,850	1,475
ALLA-3079-	MIXED LOW LEVEL WASTE STORAGE OPERATIONS	2,608	2,666	2,608	2,666
ALLA-3080-	RADIOACTIVE LIQUID WASTE TREATMENT FACILITY	500	769	500	1,074
ALLA-3081-	RCRA LANDFILL OPERATIONS	0	0	0	0
ALLA-3084-	CHEMICAL WASTE STORAGE	3,000	2,759	3,000	2,759
ALLA-3086-	HAZARDOUS WASTE OIL STORAGE FACILITY	230	0	230	0
ALLA-3088-	CHEMICAL WASTE TREATMENT	3,458	8,934	3,458	8,934
ALLA-3089-	SLUDGE SOLIDIFICATION BUILDING	0	0	0	386
ALLA-3091-	TREATMENT: EMERGENCY POWER SUPPLY, TA-50-1	0	520	0	520
ALLA-3097-	RADIOACTIVE LIQUID WASTE LINE, TA-53 TO TA-5	150	369	150	150
ALLA-3256-	MIXED WASTE RECEIVING & STORAGE FACILITY	6,640	3,000	6,640	3,000
ALLA-4114-	LOW LEVEL RADIOACTIVE LIQUID WASTE TREATMENT	2,400	3,621	2,400	3,621
ALLA-4117-	RH TRU WASTE TREATMENT	660	1,400	660	1,400
ALLA-4132-	MIXED TRU THERMAL DESTRUCTION	1,500	1,949	1,500	1,949
ALLA-4133-	LLW MANAGEMENT TREATMENT OPERATIONS	3,625	2,396	3,625	2,396
ALLA-4134-	TRU RADIOACTIVE LIQUID WASTE	488	880	488	1,156
ALLA-4135-	RADIOACTIVE LIQUID WASTE LINE REPLACEMENT, T	50	0	50	1,220
ALLA-4137-	MINIMIZATION/RECOVER/DECONTAMINATION	2,710	2,860	2,710	2,860
ALLA-4138-	WASTE MANAGEMENT OPERATIONS	15,489	15,539	15,489	15,539
ALLA-4139-	LOW LEVEL SOLID WASTE DISPOSAL	3,400	4,516	3,400	4,690
ALLA-4140-	CONSTRUCTION PROJECT DEVELOPMENT	400	619	400	619

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ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
ALLA-4141-	EXTENDED STORAGE FACILITY		0	0	294
ALLA-4142-	TRU WASTE PROCESSING FACILITY	0	600	0	205
ALLA-4143-	SHORT-TERM STORAGE FACILITY	0	1,220	0	1,220
ALLA-4145-	TA-54 INTERSECTION IMPROVEMENTS	0	0	0	1,220
ALLA-4146-	TRU SOLID WASTE STORAGE OPERATIONS	1,388	2,039	1,388	2,039
ALLA-4147-	SHOP AND STORAGE ADDITION, TA-50-54	600	20	600	20
ALLA-4149-	HAZARDOUS WASTE THERMAL DESTRUCTION	181	243	181	243
ALLA-4150-	MIXED LOW LEVEL WASTE THERMAL DESTRUCTION	562	730	562	730
ALLA-4151-	TRU THERMAL DESTRUCTION	1,500	1,948	1,500	1,948
ALLA-4152-	CENTRALIZED CHANGE ROOM FACILITY	0	595	0	595
ALLA-4153-	LOW-LEVEL RADIOACTIVE WASTE LANDFILL	0	119	0	119
ALLA-4154-	TRU WASTE TREATMENT OPERATIONS	4,845	6,476	4,845	6,476
ALLA-4155-	INCINERATOR ASH SOLIDIFICATION BUILDING	0	0	0	2,220
ALLA-4157-	PCB BUILDING	500	20	500	20
ALLA-4158-	LOW-LEVEL WASTE/MIXED WASTE INCINERATOR	0	0	0	124
ALLA-4163-	RADIOACTIVE LIQUID WASTE LINE REPLACEMENT, T	100	159	100	174
ALLA-4164-	GENERAL PLANT PROJECTS (GPP)	0	0	0	0
Subtotal AL, LOS ALAMOS LABORATORY, WM		58,834	68,441	58,834	74,256
Subtotal AL, LOS ALAMOS LABORATORY		141,354	153,374	141,354	180,652
FIELD OFFICE: AL INSTALLATION: MOUND PLANT CATEGORY: CA					
ALMD- 58-	ES&H PHASE II	41	0	41	0
ALMD-4003-	METEOROLOGICAL STATION UPGRADE	0	0	0	0
Subtotal AL, MOUND PLANT, CA		41	0	41	0
FIELD OFFICE: AL INSTALLATION: MOUND PLANT CATEGORY: ER					
ALMD-1160-	AREA B/GROUNDWATER REM (AL-MD-1)	500	0	500	0
ALMD-1161-	AREA B/GROUNDWATER ASSESSMENT (AL-MD-1)	1,395	411	1,395	574
ALMD-1163-	D&D SITES ASSESS (AL-MD-6)	262	332	262	313
ALMD-1164-	D&D SITES—HAZ. CONSTITUENTS REM. (AL-MD-6)	0	0	0	0
ALMD-1165-	DECOMMISSIONING OF BUILDING 21	0	0	0	0
ALMD-1167-	DECOMMISSIONING OF PLUTONIUM PROCESSING BUIL	850	0	850	0
ALMD-1170-	DECOMMISSIONING OF SPECIAL METALLURGICAL (SM	7,150	9,539	7,150	9,539
ALMD-1172-	DECOMMISSIONING OF SEMI-WORKS (SW) CAVE AREA	200	967	200	1,300
ALMD-1174-	DECOMMISSIONING OF SEMI-WORKS/WASTE DISPOSAL	4,526	0	4,526	0
ALMD-1175-	DECOM UNDER GRD LINES TO WASTE DISPOSAL BLDG	364	3,534	364	3,534
ALMD-1176-	DECOMMISSIONING OF WASTE TRANSFER SYSTEM (WT	1,475	0	1,475	0
ALMD-1177-	DECOMMISSIONING OF PLUTONIUM PROCESSING BUIL	671	0	671	0
ALMD-1179-	INACTIVE TANKS (AL-MD-8) REMEDIATION	0	0	0	0
ALMD-1180-	MAIN HILL SEEPS ASSESS (AL-MD-2)	1,272	0	1,272	2,251
ALMD-1181-	MAIN HILL SEEPS REMEDIATION (AL-MD-2)	0	0	0	0
ALMD-1182-	MIAMI-ERIE CANAL ASSESS (AL-MD-4)	1,270	0	1,270	5,382
ALMD-1183-	MIAMI-ERIE CANAL REMEDIATION (AL-MD-4)	0	0	0	0
ALMD-1184-	MISC. SITES ASSESS (AL-MD-3)	354	25	354	1,506
ALMD-1185-	MISCELLANEOUS SITES REMEDIATION (AL-MD-3)	0	0	0	0
ALMD-1188-	RAD CONTAMINATED SOILS ASSESSMENT (AL-MD-5)	3,189	812	3,189	1,037
ALMD-1189-	RAD CONTAMINATED SOILS REM (AL-MD-5)	0	0	0	0
ALMD-1194-	SURVEILLANCE & MAINTENANCE SEMI-WORKS CAVE A	40	42	40	42
ALMD-4005-	ASSESSMENT OF UNDER GRD LINES TO WD BUILDING	200	0	200	0
ALMD-4006-	ASSESSMENT OF CONTAMINATED SOIL AREAS	1,565	545	1,565	545
ALMD-4008-	SITE-WIDE RI/FS (AL-MD-9)	1,327	1,423	1,327	1,131
ALMD-4009-	MISC ACTIVITIES RELATED TO RI/FS TASKS (AL-M	1,838	1,285	1,838	1,496
ALMD-4010-	ER PROGRAM MANAGEMENT	1,790	1,715	1,790	1,789
ALMD-4011-	ASSESSMENT OF BUILDING 21	0	0	0	0
ALMD-4012-	INACTIVE TANKS (AL-MD-8) ASSESSMENT	940	0	940	1,587
ALMD-4020-	SITE-WIDE RI/FS REM (AL-MD-9)	855	4,334	855	1,000
ALMD-4021-	NEPA COMPLIANCE D&D DOCUMENTATION	530	200	530	200
ALMD-4022-	SURVEILLANCE AND MAINTENANCE EW AREAS	264	90	264	90
ALMD-4023-	ASSESSMENT OF SW CAVE	416	0	416	0
ALMD-4024-	EW PROGRAM MANAGEMENT	634	691	634	691

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ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
ALMD-4025-	EX PROGRAM MANAGEMENT	83	56	83	56
ALMD-4026-	ASSESSMENT OF CONTAMINATED FACILITIES	961	0	961	0
ALMD-4028-	DECOMMISSIONING OF EW SOIL	2,257	2,163	2,257	1,830
Subtotal AL, MOUND PLANT, ER		37,178	28,164	37,178	35,893
FIELD OFFICE: AL INSTALLATION: MOUND PLANT CATEGORY: WM					
ALMD-3106-	WASTE MGMT - CONT OF OPER 5820.2A IMPLEMENTA	466	1,538	466	1,538
ALMD-3107-	BASE PROGRAM: WASTE MGMT DISPOSAL OF HAZ WAS	1,390	1,696	1,390	1,696
ALMD-3108-	BASE WASTE MANAGEMENT - STORAGE OF HAZARDOUS	34	294	34	294
ALMD-3109-	BASE PROGRAM: HAZ WASTE TREATMENT	179	243	179	243
ALMD-3112-	BASE PROGRAM WASTE MGMT: MIXED WASTE DISPOSA	0	57	0	57
ALMD-3113-	BASE PROGRAM WASTE MANAGEMENT: MIXED WASTE S	45	67	45	67
ALMD-3115-	MIXED WASTE TREATMENT	129	213	129	213
ALMD-3116-	BASE PROGRAM WASTE MGMT CONT OF OPER - QA SU	220	302	220	302
ALMD-3117-	BASE PROGRAM WASTE MGMT: RAD WASTE DISPOSAL	1,363	1,653	1,363	1,653
ALMD-3118-	BASE PROGRAM WASTE MANAGEMENT - RAD WASTE ST	25	74	25	74
ALMD-3120-	BASE PROGRAM WASTE MANAGEMENT: TREAT OF RAD	3,025	1,978	3,025	1,978
ALMD-3122-	RCRA PERMITTING	905	672	905	672
ALMD-3273-	ACTIVE UNDERGROUND WASTE STORAGE TANK	61	57	61	57
ALMD-3274-	PLANT DRAINAGE DITCH, ETC.	207	540	207	540
ALMD-4014-	WASTE MINIMIZATION	347	245	347	245
Subtotal AL, MOUND PLANT, WM		8,396	9,629	8,396	9,629
Subtotal AL, MOUND PLANT		45,615	37,793	45,615	45,522
FIELD OFFICE: AL INSTALLATION: PANTEX PLANT CATEGORY: CA					
ALPX- 67-	ESH ENHANCE-RCRA WASTE STAGING FACILITY	0	0	0	0
ALPX- 68-	ESH ENHANCE-UNDERGROUND TANK REPLACEMENT	0	0	0	0
ALPX- 69-	ESH ENHANCE-WASTE TREATMENT EQUIPMENT	0	0	0	0
ALPX- 70-	HAZARDOUS WASTE STAGING FACILITY	0	0	0	0
ALPX- 72-	RCRA COMPLIANT STORAGE CONTAINERS/UNITS	0	0	0	0
ALPX- 74-	REPLACEMENT OF UNDERGROUND STORAGE TANKS (GP	0	0	0	0
Subtotal AL, PANTEX PLANT, CA		0	0	0	0
FIELD OFFICE: AL INSTALLATION: PANTEX PLANT CATEGORY: ER					
ALPX-1198-	CHEMICAL RELEASES ASSESSMENT (AL-PX-12)	0	3,992	0	3,992
ALPX-1199-	CHEMICAL RELEASES REMEDIATION (AL-PX-12)	0	0	0	0
ALPX-1200-	CONSTRUCTION LANDFILLS ASSESSMENT (AL-PX-7)	166	0	166	2,649
ALPX-1201-	CONSTR/DEMOLITION DEBRI LANDFILLS REM (AL-PX	0	0	0	0
ALPX-1203-	FIRE DEPARTMENT BURN PITS ASSESSMENT (AL-PX-	985	707	985	707
ALPX-1204-	FIRE DEPT. BURN PITS REMEDIATION (AL-PX-5)	0	0	0	0
ALPX-1205-	FIRING SITES ASSESSMENT (AL-PX-9)	157	0	157	2,681
ALPX-1206-	FIRING SITES REMEDIATION (AL-PX-9)	0	0	0	0
ALPX-1207-	FORMER COOLING TOWER ASSESSMENT (AL-PX-3)	81	261	81	261
ALPX-1208-	FORMER COOLING TOWER REMEDIATION (AL-PX-3)	0	0	0	0
ALPX-1211-	HIGH EXPL./RAD. SITES REMEDIATION (AL-PX-11)	0	0	0	0
ALPX-1212-	HIGH EXPLOSIVE/RAD. SITES ASSESSMENT (AL-PX-	135	0	135	1,204
ALPX-1213-	HYPALON POND ASSESSMENT (AL-PX-RC-2)	220	0	220	0
ALPX-1214-	HYPALON POND (ZONE 11) REMEDIATION (AL-PX-RC	400	1,000	400	1,000
ALPX-1215-	NEPA DOCUMENTATION - ASSESSMENT	0	0	0	0
ALPX-1216-	ONSITE PLAYAS AND DITCHES ASSESSMENT (AL-PX-	1,022	606	1,022	606
ALPX-1217-	PLAYAS AND DITCHES REMEDIATION (AL-PX-8)	0	0	0	0
ALPX-1218-	PRIORITY RECONNAISSANCE SITES REM (AL-PX-2)	0	0	0	0
ALPX-1219-	PRIORITY RECONNAISSANCE ASSESSMENT (AL-PX-2)	100	2,363	100	2,363
ALPX-1220-	OLD SEWAGE TREATMENT PLANT ASSESSMENT (AL-PX	183	302	183	302
ALPX-1221-	OLD SEWAGE TREATMENT PLANT REMEDIATION (AL-P	0	0	0	0
ALPX-1222-	SUPPLEMENTAL SITES ASSESSMENT (AL-PX-13)	96	0	96	2,179
ALPX-1223-	UNDERGROUND STORAGE TANKS ASSESSMENT (AL-PX-	243	185	243	185
ALPX-1224-	UNDERGND STORAGE TANKS REMEDIATION (AL-PX-10	0	70	0	70
ALPX-1225-	RCRA 3008(H)-DOCUMENTATION (ASSESSMENT)	77	80	77	80
ALPX-1226-	RCRA 3008(H)-DOCUMENTATION (REMEDIATION)	0	0	0	0
ALPX-1227-	LEAKING UNDERGRD STOR TANK ASSESSMENT (AL-PX	529	856	529	2,345
ALPX-1228-	LEAKING UNDERGRD STOR TANKS - REMED. (AL-PX-	0	0	0	0

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ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
ALPX-1229-	ER PROGRAM CONTRACT MANAGEMENT SUPPORT	2,437	2,073	2,437	2,619
ALPX-1230-	ZONE 12 NORTH GROUNDWATER ASSESSMENT (AL-PX-	1,791	523	1,791	523
ALPX-1231-	ZONE 12 NORTH GROUNDWATER REMEDIATION (AL-PX	0	0	0	0
ALPX-1232-	BURNING GROUND ASSESSMENT (AL-PX-1)	2,234	1,659	2,234	1,659
ALPX-1233-	BURNING GROUND REMEDIATION (AL-PX-1)	0	0	0	0
ALPX-1234-	SUPPLEMENTAL SITES REMEDIATION (AL-PX-13)	0	0	0	0
ALPX-1236-	INTERIM CORRECTIVE MEASURES (REMEDIATION)	0	3,625	0	3,625
Subtotal AL, PANTEX PLANT, ER		10,856	18,302	10,856	29,050
FIELD OFFICE: AL INSTALLATION: PANTEX PLANT CATEGORY: WM					
ALPX- 71-	HAZARDOUS WASTE TREATMENT & PROCESSING FACIL	2,400	1,900	2,400	1,900
ALPX- 75-	ELIMINATION OF EFFLUENT DISCHARGE PHASE II	1,200	0	1,200	0
ALPX-3123-	BASE WASTE MGMT - CONTINUITY OF OPERATIONS	1,670	1,761	1,670	1,761
ALPX-3123-Z	BASE WASTE MGMT - WASTE MINIMIZATION	700	700	700	700
ALPX-3124-H	BASE WASTE MGMT - HAZARDOUS WST DISPOSAL	3,800	4,114	3,800	4,114
ALPX-3124-R	BASE WST MGMT-RADIOACTIVE WST DISPOSAL OPERA	480	480	480	480
ALPX-3124-S	BASE WASTE MGMT - SANITARY WST DISPOSAL OPER	293	258	293	258
ALPX-3125-H	BASE WST MGMT- HAZARDOUS WST STORAGE OPERATI	581	750	581	750
ALPX-3125-M	BASE WASTE MGMT - MIXED WASTE STORAGE OPERAT	300	300	300	300
ALPX-3125-R	BASE WASTE MGMT-RADIOACTIVE WST STORAGE OPER	300	300	300	300
ALPX-3126-H	BASE WASTE MGMT-HAZARDOUS WST TREATMENT OPER	1,743	2,850	1,743	2,850
ALPX-3126-M	BASE WASTE MGMT - MIXED WASTE TREATMENT OPER	2,567	2,787	2,567	2,787
ALPX-3128-	HIGH EXPLOSIVE INCINERATOR	0	0	0	0
ALPX-3241-	HIGH EXPLOSIVE WASTE WATER RECYCLE SYSTEM	1,100	0	1,100	0
ALPX-3242-	WASTE CHEMICAL CONTROL COMPUTER SYSTEM	500	0	500	0
ALPX-3243-	HAZARDOUS WASTE UNIT CLOSURE 11-44	604	0	604	0
ALPX-3244-	HAZARDOUS WASTE UNIT CLOSURE 12-43	575	0	575	0
ALPX-3247-	BURNING GROUND UPGRADES	405	600	405	600
ALPX-3250-	SECONDARY CONTAINMENT - BLDG 11-50 SUMP	150	0	150	0
Subtotal AL, PANTEX PLANT, WM		19,368	16,800	19,368	16,800
Subtotal AL, PANTEX PLANT		30,224	35,102	30,224	45,850
FIELD OFFICE: AL INSTALLATION: PINELLAS PLANT CATEGORY: ER					
ALPP-1001-	4.5 ACRE SITE ASSESSMENT	155	0	155	0
ALPP-1002-	4 1/2 ACRE SITE REMEDIATION (AL-PI-1)	368	1,020	368	1,020
ALPP-1003-	FLORIDAN AQUIFER ASSESSMENT (AL-PI-3)	800	292	800	292
ALPP-1004-	FLORIDAN AQUIFER REMEDIATION (AL-PI-3)	0	0	0	0
ALPP-1005-	MISC. SITES ASSESSMENT (AL-PI-4)	843	172	843	344
ALPP-1006-	MISCELLANEOUS SITES REMEDIATION (AL-PI-4)	484	3,983	484	8,521
ALPP-1007-	NEPA DOCUMENTATION (EA) - ASSESSMENT	65	67	65	134
ALPP-1010-	PEAK OIL PRP CONTRIBUTION ASSESSMENT	159	181	159	181
ALPP-1011-	PEAK OIL PRP CONTRIBUTION REMEDIATION	0	0	0	0
ALPP-1012-	SLUDGE HOLDING TANK	0	0	0	0
ALPP-1013-	PROJECT MANAGEMENT	166	185	166	369
Subtotal AL, PINELLAS PLANT, ER		3,040	5,900	3,040	10,861
FIELD OFFICE: AL INSTALLATION: PINELLAS PLANT CATEGORY: WM					
ALPP-3038-	CONTINUITY OF OPERATIONS	287	657	287	657
ALPP-3040-A	DISPOSAL - HAZARDOUS	720	808	720	808
ALPP-3040-B	DISPOSAL - LOW LEVEL WASTE	80	90	80	90
ALPP-3041-A	STORAGE - HAZARDOUS	197	212	197	212
ALPP-3041-B	STORAGE - LOW LEVEL WASTE	77	82	77	82
ALPP-3043-	TREATMENT	176	690	176	690
ALPP-3237-	WASTE MINIMIZATION	30	33	30	33
Subtotal AL, PINELLAS PLANT, WM		1,567	2,572	1,567	2,572
Subtotal AL, PINELLAS PLANT		4,607	8,472	4,607	13,433
FIELD OFFICE: AL INSTALLATION: SANDIA ALBUQUERQUE CATEGORY: CA					
ALSA- 91-	HYDROGEOLOGIC WELLS	308	160	308	160
ALSA- 94-	SEWER EFFLUENT MONITORING SYSTEM	0	0	0	0
ALSA- 95-	SEWER LINE	1,000	0	1,000	0

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ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
ALSA- 96-	AIR POLLUTION CONTROL AND MONITORING DEVICES	1,000	1,040	1,000	1,040
ALSA- 100-	WATER POLLUTION	1,000	1,040	1,000	1,040
Subtotal AL, SANDIA ALBUQUERQUE, CA		3,308	2,240	3,308	2,240
FIELD OFFICE: AL INSTALLATION: SANDIA ALBUQUERQUE CATEGORY: ER					
ALSA-1266-	CENTRAL COYOTE TEST FIELD ASSESSMENT (AL-SA-	0	0	0	195
ALSA-1267-	CHEMICAL WASTE LANDFILL ASSESSMENT	841	2,499	41	2,499
ALSA-1268-	CHEMICAL WASTE LANDFILL CLOSURE REM (AL-SA-R	10	15	10	15
ALSA-1270-	COYOTE CANYON BLAST AREA ASSESSMENT (AL-SA-3	104	0	104	6,798
ALSA-1272-	COYOTE SPRINGS ASSESSMENT (AL-SA-7)	128	1,683	128	1,683
ALSA-1273-	EDGEWOOD TEST SITE ASSESSMENT	54	0	54	0
ALSA-1281-	KAUAI TEST FACILITY (AL-SA-18) ASSESSMENT	0	0	0	0
ALSA-1282-	LURANCE CANYON ASSESSMENT (AL-SA-10)	0	0	0	196
ALSA-1283-	MULTI-PARTY SITE REMEDIATION (AL-SA-14)	2,500	0	2,500	0
ALSA-1284-	MULTI-PARTY SITES - ASSESSMENT (AL-SA-14)	70	0	70	101
ALSA-1285-	NEPA ASSESSMENT	199	33	199	33
ALSA-1288-	PENDULUM AREA ASSESSMENT (AL-SA-6)	125	0	125	1,749
ALSA-1289-	MIXED WASTE LANDFILL ASSESSMENT (AL-SA-RC-2)	3,013	912	3,013	912
ALSA-1292-	SANDIA ENGINEERING REACTOR D&D	32	32	32	46
ALSA-1293-	SCHOOLHOUSE MESA ASSESSMENT (AL-SA-11)	0	0	0	0
ALSA-1295-	SEPTIC TANKS AND DRAINFIELDS ASSESSMENT (SA-	194	1,650	194	1,650
ALSA-1297-	SOUTH COYOTE TEST FIELD ASSESSMENT (AL-SA-13	0	0	0	0
ALSA-1298-	SOUTHWEST COYOTE TEST FIELD ASSESSMENT (SA-8	110	0	110	153
ALSA-1300-	STORAGE TANKS ASSESSMENT (AL-SA-20)	91	624	91	624
ALSA-1302-	TECHNICAL AREA 1 ASSESSMENT (AL-SA-9)	0	0	0	0
ALSA-1303-	TECHNICAL AREA 2 ASSESSMENT (AL-SA-2)	375	2,628	375	2,628
ALSA-1306-A	TECHNICAL AREAS 3 & 5 (AL-SA-1)	1,624	1,298	1,624	1,298
ALSA-1306-B	LIQUID WASTE DISPOSAL SYSTEM	1,246	811	1,246	811
ALSA-1308-	THUNDER RANGE ASSESSMENT (SA-4)	193	113	193	113
ALSA-1309-	TIJERAS ARROYO ASSESSMENT (AL-SA-12)	0	0	0	0
ALSA-1311-	TONOPAH TEST RANGE AREA 9 ASSESSMENT (AL-SA-	0	0	0	0
ALSA-1312-	TONOPAH TEST RANGE, AREA 3 ASSESSMENT (AL-SA	133	0	133	6,587
ALSA-1313-	TONOPAH TEST RANGE, TEST AREAS ASSESS (AL-SA	0	0	0	0
ALSA-1326-	PROGRAM MANAGEMENT	1,767	1,595	1,767	3,177
ALSA-1327-	REMOTE FACILITIES	273	42	273	42
ALSA-1330-	SITE WIDE CHARACTERIZATION	0	2,044	0	4,156
Subtotal AL, SANDIA ALBUQUERQUE, ER		13,082	15,979	13,082	35,466
FIELD OFFICE: AL INSTALLATION: SANDIA ALBUQUERQUE CATEGORY: WM					
ALSA-3100-	WASTE MANAGEMENT FACILITIES CONSTRUCTION	291	250	291	250
ALSA-3183-	ASBESTOS WASTE MANAGEMENT	400	450	400	450
ALSA-3193-A	MWF CONSTRUCTION CONTINUATION	1,365	550	1,365	550
ALSA-3193-C	RAD/MIXED WASTE EQUIPMENT	2,100	1,060	2,100	1,060
ALSA-3200-A	HAZARDOUS WASTE MANAGEMENT OPERATIONS	1,550	1,700	1,550	1,700
ALSA-3200-B	COLLECTION REPKG. AND STORAGE OF HAZ WASTE	1,000	1,050	1,000	1,050
ALSA-3200-C	TRANSPORTATION & DISPOSAL OF HAZ. WASTES	1,900	2,050	1,900	2,050
ALSA-3200-E	CONST. & MOD., UPGRADE OF HAZ. WASTE MANAG.	595	480	595	480
ALSA-3202-A	CONTINUITY OF RAD/MW MGMT. OPERATION	2,825	2,270	2,825	2,270
ALSA-3202-B	TREATMENT AND STORAGE OF RADIOACTIVE/MIXED W	1,900	1,800	1,900	1,800
ALSA-3202-C	CERTIFICATION, TRANSPORTATION, DISPOSAL OF R	950	1,000	950	1,000
ALSA-3203-	RADIOACTIVE PROCESS WASTE WATER	231	435	231	435
ALSA-3204-A	PCB MANAGEMENT	350	300	350	300
ALSA-3204-B	PCB TRANSPORTATION AND DISPOSAL	250	500	250	500
ALSA-3223-A	HAZARDOUS/RAD/MIXED WASTE MINIMIZATION PLANN	575	595	575	595
ALSA-5006-	WASTE MANAGEMENT AT TONOPAH TEST RANGE	800	800	800	800
ALSA-5008-	MEDICAL WASTE MANAGEMENT	300	300	300	300
ALSA-5009-	RW/MW AT TONOPAH TEST RANGE	50	55	50	55
ALSA-5010-	DP WASTE STORAGE	405	405	405	405
Subtotal AL, SANDIA ALBUQUERQUE, WM		17,837	16,050	17,837	16,050
Subtotal AL, SANDIA ALBUQUERQUE		34,227	34,269	34,227	53,756

ACTIVITY DATA SHEETS
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ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
FIELD OFFICE: AL INSTALLATION: SANDIA LIVERMORE CATEGORY: CA					
ALSL- 103-	TRL TRITIUM MONITOR SYSTEM REPLACEMENT	755	0	755	0
ALSL- 103-A	TRL TRITIUM MONITOR SYSTEM REPLACEMENT	0	0	0	0
Subtotal AL, SANDIA LIVERMORE, CA		755	0	755	0
FIELD OFFICE: AL INSTALLATION: SANDIA LIVERMORE CATEGORY: ER					
ALSL-1314-	FUEL OIL SPILL ASSESSMENT (AL-SL-2)	1,332	0	1,332	0
ALSL-1315-	FUEL OIL SPILL REMEDIATION (AL-SL-2A)	0	989	0	989
ALSL-1316-	NAVY LANDFILL ASSESSMENT (AL-SL-3)	275	0	275	0
ALSL-1317-	NAVY LANDFILL REMEDIATION (AL-SL-3A)	3,421	1,996	3,421	2,096
ALSL-1318-	NEPA AT SNLL	1,500	61	1,500	61
ALSL-1321-	SNLL MISCELLANEOUS SITES	615	470	615	543
ALSL-1323-	ERP MANAGEMENT/ASSESSMENT	255	311	255	311
ALSL-1325-	ER PROGRAM MANAGEMENT/REMEDIATION	255	311	255	311
ALSL-1328-	SNLL MISC. SITES - REMEDIATION	0	60	0	60
Subtotal AL, SANDIA LIVERMORE, ER		7,653	4,198	7,653	4,371
FIELD OFFICE: AL INSTALLATION: SANDIA LIVERMORE CATEGORY: WM					
ALSL-7101-	DISPOSAL OF LOW LEVEL WASTE	27	29	27	29
ALSL-7102-	DISPOSAL OF LOW LEVEL MIXED WASTE	17	17	17	17
ALSL-7103-	DISPOSAL OF HAZARDOUS/TOXIC WASTE	311	325	311	325
ALSL-7300-	WASTE MINIMIZATION	173	182	173	182
ALSL-7501-	STORAGE OF LOW LEVEL WASTE	149	157	149	157
ALSL-7502-	STORAGE OF LOW LEVEL MIXED WASTE	84	88	84	88
ALSL-7503-	STORAGE OF HAZARDOUS/TOXIC WASTE	453	476	453	476
ALSL-7701-	TREATMENT OF LOW LEVEL WASTE	21	22	21	22
ALSL-7702-	TREATMENT OF LOW LEVEL MIXED WASTE	21	22	21	22
ALSL-7703-	TREATMENT OF HAZARDOUS/TOXIC WASTE	56	60	56	60
ALSL-7950-	WM CONTINUITY OF OPERATIONS	463	488	463	488
Subtotal AL, SANDIA LIVERMORE, WM		1,775	1,866	1,775	1,866
Subtotal AL, SANDIA LIVERMORE		10,183	6,064	10,183	6,237
FIELD OFFICE: AL INSTALLATION: UMTRA PROJECT OFFICE CATEGORY: ER					
ALUM-1322-B	UMTRA PROJECT AMBROSIA LAKE REMEDIATION	7,745	6,210	7,713	5,306
ALUM-1325-B	UMTRA PROJECT BELFIELD/BOWMAN REMEDIATION	154	37	177	7,965
ALUM-1330-B	UMTRA PROJECT FALLS CITY REMEDIATION	10,985	11,392	11,168	11,222
ALUM-1332-B	UMTRA PROJECT GRAND JUNCTION REMEDIATION	40,142	32,089	38,030	31,888
ALUM-1337-B	UMTRA PROJECT GUNNISON REMEDIATION	9,957	14,927	8,952	13,493
ALUM-1341-B	UMTRA PROJECT LOWMAN REMEDIATION	115	68	1,077	67
ALUM-1344-B	UMTRA PROJECT MAYBELL REMEDIATION	178	38	177	82
ALUM-1346-B	UMTRA PROJECT MEXICAN HAT REMEDIATION	12,466	23,616	5,087	12,256
ALUM-1349-B	UMTRA PROJECT MONUMENT VALLEY REMEDIATION	6,944	5,151	1,801	4,909
ALUM-1351-B	UMTRA PROJECT NATURITA REMEDIATION	35	36	139	10,252
ALUM-1354-B	UMTRA PROJECT RIFLE (2 SITES) REMEDIATION	74	71	12,748	14,652
ALUM-1361-B	UMTRA PROJECT SLICK ROCK (2 SITES) REMEDIATI	50	50	83	49
ALUM-1380-A	UMTRA PROJECT INCOMPLETE SITES ASSESSMENT	13,289	13,227	15,015	14,887
ALUM-1381-A	UMTRA PROJECT COMPLETED SITES ASSESSMENT	1,805	110	1,771	87
ALUM-1382-B	UMTRA PROJECT COMPLETED SITES REMEDIATION	77	53	78	67
ALUM-1383-A	UMTGR PROJECT (ALL SITES) ASSESSMENT	2,000	4,600	2,000	12,000
ALUM-1383-B	UMTGR PROJECT (ALL SITES) REMEDIATION	0	0	0	0
ALUM-1392-A	UMTGR PROJECT TECHNICAL SUPPORT SERVICES	0	0	0	0
ALUM-1393-A	UMTGR PROJECT REMEDIAL ACTION PROGRAM INFO.	0	0	0	0
Subtotal AL, UMTRA PROJECT OFFICE, ER		106,016	111,675	106,016	139,182
Subtotal AL, UMTRA PROJECT OFFICE		106,016	111,675	106,016	139,182

ACTIVITY DATA SHEETS
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ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
FIELD OFFICE: AL INSTALLATION: WASTE ISOLATION PILOT PROJECT CATEGORY: WM					
ALWP-3234-	BASE WASTE MANAGEMENT-STORAGE	142,118	185,000	142,118	202,000
Subtotal AL, WASTE ISOLATION PILOT PROJECT, WM		142,118	185,000	142,118	202,000
Subtotal AL, WASTE ISOLATION PILOT PROJECT		142,118	185,000	142,118	202,000
Subtotal AL		558,278	605,100	558,278	719,983
FIELD OFFICE: CH INSTALLATION: AMES LABORATORY, IOWA STATE UNIV. CATEGORY: ER					
CH-5053-01	UNDERGROUND STORAGE TANK REMOVAL (DIESEL FUE	0	83	0	83
CH-5054-01	CHEMICAL DISPOSAL SITE ASSESSMENT	0	160	0	160
CH-5054-02	CHEMICAL DISPOSAL SITE ASSESSMENT	0	160	0	160
CH-5055-01	CHEMICAL DISPOSAL SITE REMEDIATION	0	240	0	340
CH-5055-02	CHEMICAL DISPOSAL SITE REMEDIATION	0	240	0	340
Subtotal CH, AMES LABORATORY, IOWA STATE UNIV., ER		0	883	0	1,083
FIELD OFFICE: CH INSTALLATION: AMES LABORATORY, IOWA STATE UNIV. CATEGORY: WM					
CH-5002-02	WASTE MANAGEMENT OPERATION	115	63	115	63
CH-5002-03	WASTE MANAGEMENT OPERATION	0	0	0	0
CH-5002-04	WASTE MANAGEMENT OPERATION	90	101	90	101
Subtotal CH, AMES LABORATORY, IOWA STATE UNIV., WM		205	164	205	164
Subtotal CH, AMES LABORATORY, IOWA STATE UNIV.		205	1,047	205	1,247
FIELD OFFICE: CH INSTALLATION: ARGONNE EAST CATEGORY: CA					
CH-1003-00	800 Area Landfill Leachate Collection/Treatm	1,400	501	1,400	501
CH-1004-00	Treatment of Boiler House Area Wastewater	0	0	0	0
CH-1005-00	Cooling Tower Blowdown Water Diversion	0	0	0	0
CH-1006-00	Laboratory Wastewater Treatment Plant Improv	3,185	0	3,185	0
CH-1010-00	Sanitary Wastewater Treatment Plant Improvem	3,500	532	3,500	532
CH-1011-00	Laboratory and Sanitary Sewer Collection Sys	832	0	832	0
CH-1012-00	Chloride Removal Plant	0	130	0	130
CH-1017-00	Canal Water Treatment Rehabilitation	375	827	375	827
CH-1018-00	Equalization Pond Rehabilitation	0	0	0	0
CH-1019-00	Laboratory and Sanitary Sewer Collection Sys	0	0	0	0
Subtotal CH, ARGONNE EAST, CA		9,292	1,990	9,292	1,990
FIELD OFFICE: CH INSTALLATION: ARGONNE EAST CATEGORY: ER					
CH-1008-00	Freund Pond Characterization	0	0	0	0
CH-1009-00	Freund Pond Remediation	0	0	0	0
CH-1022-00	UST Removal	0	0	0	0
CH-1023-00	800 Area Landfill Characterization	300	573	300	573
CH-1024-00	800 Area Landfill Remediation	110	0	110	500
CH-1025-00	East Area Sewage Treatment Plant Characteriz	0	0	0	0
CH-1026-00	East Area Sewage Treatment Plant Remediation	0	0	0	4,142
CH-1027-00	570 Holding Pond Characterization	0	0	0	0
CH-1028-00	570 Holding Pond Remediation	0	290	0	290
CH-1029-00	Sawmill Creek Characterization	0	0	0	0
CH-1030-00	Sawmill Creek Cleanup	0	26	0	26
CH-1031-00	Lime Sludge Removal	0	150	0	150
CH-1032-00	317/319/ENE Area Characterization	300	573	300	573
CH-1033-00	317/319/ENE Area Remediation	119	150	119	2,910
CH-1034-01	D&D of the Experimental Boiling Water Reacto	0	0	0	0
CH-1034-02	D&D of the Experimental Boiling Water Reacto	2,528	1,288	2,528	2,650
CH-1035-00	D&D of the CP-5 Reactor	40	0	40	4,400
CH-1036-00	Reactor Surveillance/Maintenance	165	170	165	170
CH-1037-00	D&D of the Hot Cells	350	1,150	350	3,500
CH-1038-00	Hot Cells Surveillance/Maintenance	500	300	500	0
CH-1039-00	D&D of the Juggernaut Reactor	0	0	0	0
CH-1040-00	D&D of the Argonne Thermal Source Reactor	0	0	0	0
CH-1041-00	D&D of the 60" Cyclotron	0	0	0	0
CH-1044-01	Eastern D&D Technical Criteria and Guidance	175	175	175	175
CH-1045-01	FUSRAP Technical Criteria and Guidance Assis	100	175	100	175

ACTIVITY DATA SHEETS
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ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
CH-1046-01	FUSRAP NEPA Process Planning and Implementat	1,225	500	1,225	500
CH-1047-01	WSSRAP NEPA Process Planning and Implementat	1,300	1,400	1,300	890
CH-1086-00	Decision Analysis Process for Environmental	0	0	0	0
CH-1186-00	100 Area Characterization	250	0	250	0
CH-1187-00	Outfall Area Characterization	0	270	0	312
CH-1188-00	CP-5 Site Characterization	0	156	0	156
CH-1200-00	800 Area Hydrogeological Assessment	0	300	0	300
CH-1201-00	Sitewide Hydrogeological Baseline Study	0	200	0	200
CH-1202-00	Inactive Waste Site Management Plan	0	100	0	100
CH-1205-00	Sitewide Well and Borehole Closure	0	15	0	15
CH-1206-00	Solid Waste Management Units Assessment	0	300	0	300
CH-1209-00	PCB Contaminated Sludge Remediation	0	0	0	0
CH-1213-00	Decontamination and Decommissioning Program	0	50	0	50
CH-1214-00	D&D of the ZPR Reactor Facilities, Building	0	0	0	0
Subtotal CH, ARGONNE EAST, ER		7,462	8,311	7,462	23,057
FIELD OFFICE: CH INSTALLATION: ARGONNE EAST CATEGORY: WM					
CH-1007-00	UST Upgrade/Replacement	0	50	0	245
CH-1014-00	PCB Transformer Disposal	0	0	0	0
CH-1053-00	Regulated Waste Minimization	10	50	10	520
CH-1054-00	Rehabilitation of Waste Management Building	400	729	400	1,729
CH-1055-01	Hazardous, Radioactive, & Mixed Waste Storag	0	0	0	0
CH-1055-02	Hazardous, Radioactive, & Mixed Waste Storag	425	450	425	1,231
CH-1061-01	TRUEX Technology Base Development	0	0	0	0
CH-1063-01	TRU Waste Management (AGHCF Upgrade)	500	50	500	200
CH-1063-02	AGHCF Refurbishment and Waste Disposal	100	0	100	0
CH-1064-00	QA Program and Technical Support for HLW Acc	0	0	0	0
CH-1065-01	HLW Technology	592	0	592	0
CH-1065-02	HLW Technology	150	0	150	0
CH-1066-00	Actinide Speciation via Spectroscopy	0	0	0	0
CH-1073-00	Continuation of Operations	58	0	58	0
CH-1073-01	Continuation of Operations	1,505	6,197	1,505	7,578
CH-1074-HZ	Hazardous, Radioactive, and Mixed Waste Trea	0	255	0	359
CH-1074-LL	Hazardous, Radioactive, and Mixed Waste Trea	131	405	131	572
CH-1074-LM	Hazardous, Radioactive, and Mixed Waste Trea	24	75	24	105
CH-1074-TM	Hazardous, Radioactive, and Mixed Waste Trea	2	7	2	11
CH-1074-TR	Hazardous, Radioactive, and Mixed Waste Trea	2	7	2	11
CH-1075-HZ	Hazardous, Radioactive, and Mixed Waste Stor	22	272	22	427
CH-1075-LL	Hazardous, Radioactive, and Mixed Waste Stor	34	432	34	678
CH-1075-LM	Hazardous, Radioactive, and Mixed Waste Stor	6	80	6	126
CH-1075-TM	Hazardous, Radioactive, and Mixed Waste Stor	1	8	1	12
CH-1075-TR	Hazardous, Radioactive, and Mixed Waste Stor	1	8	1	12
CH-1076-HZ	Hazardous, Radioactive, and Mixed Waste Disp	0	1,601	0	1,854
CH-1076-LL	Hazardous, Radioactive, and Mixed Waste Disp	0	2,673	0	3,892
CH-1076-LM	Hazardous, Radioactive, and Mixed Waste Disp	0	510	0	555
CH-1076-LO	Hazardous, Radioactive, and Mixed Waste Disp	0	0	0	0
CH-1076-TM	Hazardous, Radioactive, and Mixed Waste Disp	1	8	1	9
CH-1076-TR	Hazardous, Radioactive, and Mixed Waste Disp	4	62	4	69
CH-1155-00	Independent Review of CDRs and FSARs	0	0	0	0
CH-1170-01	PCB Contaminated Transformers Retrofill	0	0	0	0
CH-1172-00	Preparation of Radionuclide Air Permits	0	0	0	0
CH-1173-00	RCRA Part B Permit	0	0	0	0
CH-1189-01	Stormwater Discharge Characterization	200	50	200	100
CH-1189-02	Stormwater Discharge Characterization	0	0	0	0
CH-1191-00	Sewage Collection System Characterization	0	364	0	364
CH-1192-01	ANL-E Five Year Plan Preparation Support	0	0	0	0
CH-1192-02	ANL-E Five Year Plan Preparation Support	160	0	160	400
CH-1193-00	Technical Review Group (B&R GF portion)	0	0	0	0
CH-1194-00	Technical Review Group (B&R AH Portion)	0	0	0	0
CH-1198-00	Processing of New Brunswick Lab PU Wastes	0	0	0	0
CH-1207-00	Rerouting & Plugging of Floor Drains	0	325	0	325
CH-1208-00	Outfall 010 Upgrade	0	326	0	326
CH-1210-00	Waste Isolation Pilot Plant (WIPP) Pretest C	0	0	0	0

ACTIVITY DATA SHEETS
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ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
CH-1211-00	ESH Expert System Development and Support	0	0	0	0
CH-1212-00	Off-site Well Sampling and Analysis	0	0	0	0
Subtotal CH, ARGONNE EAST, WM		4,328	14,994	4,328	21,710
Subtotal CH, ARGONNE EAST		21,082	25,295	21,082	46,757
FIELD OFFICE: CH INSTALLATION: ARGONNE WEST CATEGORY: CA					
CH-1503-AB	UNDERGROUND STORAGE TANKS	10	0	10	0
CH-1509-AA	LINERS-RADIOACTIVE SCRAP & WASTE FACILITY RC	283	0	283	0
CH-1519-AA	RADIOACTIVE SCRAP & WASTE FACILITY RCRA PERM	236	247	236	247
Subtotal CH, ARGONNE WEST, CA		529	247	529	247
FIELD OFFICE: CH INSTALLATION: ARGONNE WEST CATEGORY: ER					
CH-1501-	COCA/IAG ACTIVITIES	181	460	181	460
CH-1507-	PCB SPILL CLEANUP	533	0	533	0
CH-1514-AC	SURVEILLANCE AND MAINTENANCE	3	3	3	0
CH-1515-AC	D&D LIQUID WASTE PROCESSING AREA	0	50	0	50
CH-1522-	ENVIRONMENTAL,SAFETY, AND HEALTH AGREEMENT I	268	272	268	272
CH-1524-AD	TIGER TEAM FINDING CORRECTIONS FOR ENVIRONME	0	200	0	200
Subtotal CH, ARGONNE WEST, ER		985	985	985	982
FIELD OFFICE: CH INSTALLATION: ARGONNE WEST CATEGORY: WM					
CH-1504-	ANL-W's REMOTE HANDLED TRANSURANIC-MW CERTIF	0	0	0	0
CH-1505-AA	RADIOACTIVE SODIUM WASTE PROCESS FACILITY (R	0	315	0	315
CH-1506-	LOW-LEVEL WASTE DISPOSAL TO RWMC	307	476	307	476
CH-1506-01	TRU AND TRU-MIXED WASTE DISPOSAL TO RWMC/WIP	173	268	173	268
CH-1508-	HAZARDOUS WASTE OPERATIONS	143	149	143	149
CH-1508-01	CONTACT HANDLED LOW-LEVEL MIXED WASTE OPERAT	23	24	23	24
CH-1510-01	RSWF OPERATIONS FOR TRU WASTE AND TRU MIXED	500	202	500	202
CH-1510-AA	RSWF OPERATIONS FOR LOW-LEVEL RADIOACTIVE AN	254	242	254	242
CH-1512-	PCB CAPACITOR DISPOSAL	26	0	26	0
CH-1513-	RADIOACTIVE LOW-LEVEL LIQUID WASTE TREATMENT	255	267	255	267
CH-1516-	SODIUM CONVERSION	0	0	0	0
CH-1517-AB	UNDERGROUND STORAGE TANKS UPGRADE	0	24	0	24
CH-1518-AA	RSWF MIXED WASTE OPERATIONS	0	283	0	283
CH-1523-	LAB AND OFFICE BUILDING RADIOACTIVE LIQUID T	129	0	129	0
CH-1525-AD	TIGER TEAM FINDING CORRECTIONS FOR WASTE MAN	0	0	0	300
CH-1526-00	Waste Isolation Pilot Plant (WIPP) Pretest C	0	0	0	0
Subtotal CH, ARGONNE WEST, WM		1,810	2,250	1,810	2,550
Subtotal CH, ARGONNE WEST		3,324	3,482	3,324	3,779
FIELD OFFICE: CH INSTALLATION: BATTELLE COLUMBUS LABORATORIES CATEGORY: ER					
CH-6001-EW	Battelle Columbus Labs. Decommissioning Proj	190	110	190	110
CH-6001-EX	Battelle Columbus Labs. Decommissioning Proj	1,104	658	1,104	707
CH-6002-EW	Battelle Columbus Labs. Decommissioning Proj	5,890	0	5,890	0
CH-6002-EX	Battelle Columbus Labs. Decommissioning Proj	10,844	13,585	10,844	18,900
Subtotal CH, BATTELLE COLUMBUS LABORATORIES, ER		18,028	14,353	18,028	19,717
Subtotal CH, BATTELLE COLUMBUS LABORATORIES		18,028	14,353	18,028	19,717
FIELD OFFICE: CH INSTALLATION: BROOKHAVEN NATIONAL LABORATORY CATEGORY: CA					
CH-1-HQ	Hazardous Waste Management Upgrades,I (old 2	238	0	238	0
CH-2004-02	STORAGE TANK REMOVAL/UPGRADE	0	0	0	0
CH-2005-01	UPGRADES TO DRUM STORAGE AREA, CENTRAL SHOPS	0	0	0	0
CH-2007-01	CESSPOOL REMOVAL	0	0	0	0
Subtotal CH, BROOKHAVEN NATIONAL LABORATORY, CA		238	0	238	0
FIELD OFFICE: CH INSTALLATION: BROOKHAVEN NATIONAL LABORATORY CATEGORY: ER					
CH-2001-00	GROUNDWATER CHARACTERIZATION	200	2,272	200	4,306
CH-2002-02	SOIL CHARACTERIZATION	556	813	556	2,195
CH-2011-00	D&D BGRR, PHASE I THROUGH IV	0	0	0	3,500

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ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
CH-2012-01	D&D PLAN FOR THE BMRR	0	0	0	0
CH-2014-01	D&D OF WASTE TANKS	0	0	0	0
CH-2015-00	RD/RA FOR OPERABLE UNIT I (HWMF+)	0	0	0	0
CH-2016-01	WASTE SITE CLOSURE	1,901	0	1,901	0
CH-2031-01	ENVIRONMENTAL RISKS, COST EFFECTIVENESS OF U	340	370	340	370
CH-2033-00	RI/FS AND EE/CA TECHNICAL SUPPORT	1,601	2,508	1,601	3,995
CH-2069-00	PERFORMANCE ASSESSMENT RELIABILITY ANALYSIS	0	0	0	0
CH-2082-00	ENVIRONMENTAL REMOVAL ACTIVITIES	0	400	0	400
CH-2083-00	RI/FS AND RD/RA FOR OPERABLE UNIT IV	160	73	160	73
CH-2084-00	RD/RA FOR OPERABLE UNIT V (STP+)	0	0	0	0
CH-2089-00	RD/RA OF OU III (BUBBLE CHAMBER)	0	0	0	0
CH-2090-00	RD/RA FOR OU VIII (SEWER LINES/WELLS)	0	0	0	0
CH-2091-00	RD/RA FOR OU VI (UPLAND RECHARGE AREA/MEADOW	0	0	0	0
CH-2093-00	AIR/SURFACE WATER/SEDIMENT CHARACTERIZATION	0	200	0	200
CH-2094-00	RD/RA FOR OU II (BGRR+)	0	0	0	0
CH-2095-00	ENVIRONMENTAL RESTORATION - NEPA SUPPORT	0	0	0	148
Subtotal CH, BROOKHAVEN NATIONAL LABORATORY, ER		4,758	6,636	4,758	15,187
FIELD OFFICE: CH INSTALLATION: BROOKHAVEN NATIONAL LABORATORY CATEGORY: WM					
CH-2003-02	SHIPMENT & DISPOSAL OF ACCUMULATED ACTIVATED	1,265	0	1,265	0
CH-2006-00	DETECTOR STATION CONSTRUCTION	0	0	0	0
CH-2008-02	HAZARDOUS WASTE MANAGEMENT UPGRADES I	0	0	0	0
CH-2009-02	WASTE MINIMIZATION FACILITY UPGRADES	1,400	53	1,400	53
CH-2010-01	HAZARDOUS WASTE MANAGEMENT UPGRADE II	0	1,200	0	650
CH-2013-02	WASTE CONCENTRATION FACILITY OPERATION	463	133	463	133
CH-2017-EX	HAZARDOUS/RADIOACTIVE WASTE DISPOSAL OPERATI	3,127	789	3,127	839
CH-2032-00	INSTALLATION OF AUTOMATIC DIVERSION SYSTEM	0	0	0	0
CH-2034-01	FLOOR DRAIN RECONNECTION	0	959	0	2,500
CH-2035-00	SANITARY SYSTEM UPGRADES - PHASE I and II	0	0	0	0
CH-2086-00	HAZARDOUS WASTE MANAGEMENT FACILITY PHASE II	0	0	0	0
CH-2088-00	HAZARDOUS/RADIOACTIVE WASTE DISPOSAL OPERATI	940	0	940	0
CH-2096-00	WASTE CONCENTRATION FACILITY - OPERATION	0	364	0	364
CH-2097-01	HAZARDOUS WASTE DISPOSAL	0	1,234	0	1,234
CH-2098-01	RADIOACTIVE WASTE DISPOSAL	0	2,327	0	2,597
CH-2100-00	TECHNICAL ASSISTANCE TO DOE/EM HLW SAFETY EV	0	0	0	0
Subtotal CH, BROOKHAVEN NATIONAL LABORATORY, WM		7,195	7,059	7,195	8,370
Subtotal CH, BROOKHAVEN NATIONAL LABORATORY		12,191	13,695	12,191	23,557
FIELD OFFICE: CH INSTALLATION: CH CATEGORY: ER					
CH-8006-01	Program Support for Agreements in Principle	0	0	0	0
CH-8006-02	Program Support for Agreements in Principle	0	280	0	280
CH-8007-00	Program Support for Agreements in Principle	0	20	0	20
CH-8008-00	Program Support for Agreements in Principle	0	50	0	50
CH-8009-00	Program Support for Agreements in Principle	0	370	0	500
CH-8010-00	Program Support for Agreement in Principle -	0	50	0	50
CH-8019-EW	Chicago Operations S&M Overview and Response	0	65	0	65
CH-8019-EX	Chicago Operations S&M Overview and Response	0	65	0	65
CH-8020-00	Decommissioning of the SPRU facility	0	300	0	500
CH-8021-EW	Site A - Surveillance and Maintenance	0	0	0	0
CH-8021-WW	Site A - Surveillance and Maintenance	125	120	125	120
CH-8022-00	CH Prime Environmental Restoration Program S	1,000	185	1,000	104
CH-8022-EX	CH Prime Environmental Restoration Program S	0	250	0	250
CH-8024-00	Sitewide NEPA Assessment	0	250	0	622
Subtotal CH, CH, ER		1,125	2,005	1,125	2,626

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ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
FIELD OFFICE: CH INSTALLATION: CH CATEGORY: WM					
CH-8011-00	Continuity of Operations- Chicago Operations	600	500	600	770
CH-8018-00	CH Waste Minimization Program	44	44	44	44
CH-8023-00	NEPA Document Preparation- Argonne National	0	0	0	250
CH-8026-00	Program Support for Agreements in Principle	0	272	0	272
Subtotal CH, CH, WM		644	816	644	1,336
Subtotal CH, CH		1,769	2,821	1,769	3,962
FIELD OFFICE: CH INSTALLATION: FERMILAB CATEGORY: CA					
CH-2-HQ	PCB Contamination Cleanup (old 4005-03)	569	0	569	0
CH-4012-02	LEAKING UNDERGROUND GAS TANK CLEANUP	0	0	0	0
Subtotal CH, FERMILAB, CA		569	0	569	0
FIELD OFFICE: CH INSTALLATION: FERMILAB CATEGORY: ER					
CH-4003-03	PCB CONTAMINATION ASSESSMENT	0	0	0	0
CH-4014-01	CHROMATE CONTAMINATION CLEANUP	14	47	14	47
Subtotal CH, FERMILAB, ER		14	47	14	47
FIELD OFFICE: CH INSTALLATION: FERMILAB CATEGORY: WM					
CH-4005-03	PCB CONTAMINATION CLEANUP	569	501	569	501
CH-4008-02	WASTE HANDLING OPERATIONS	204	412	204	535
CH-4009-03	RADIOACTIVE/MIXED WASTE TREATMENT	189	248	189	248
CH-4010-02	HAZARDOUS WASTE HANDLING & STORAGE	60	92	60	92
CH-4011-03	RADIOACTIVE/MIXED WASTE DISPOSAL	87	86	87	86
CH-4013-01	REDUCTION OF PCB CONCENTRATION	240	220	240	268
CH-4015-01	RADIOACTIVE WASTE PROCESSING BUILDING	0	0	0	1,200
CH-4016-01	RADIOACTIVE/MIXED WASTE STORAGE	44	53	44	53
CH-4017-01	CHEMICAL WASTE DISPOSAL	138	335	138	335
CH-4018-01	NPDES PERMIT APPLICATION FOR STORM WATER DIS	0	0	0	0
Subtotal CH, FERMILAB, WM		1,531	1,947	1,531	3,318
Subtotal CH, FERMILAB		2,114	1,994	2,114	3,365
FIELD OFFICE: CH INSTALLATION: HALLAM, NEBRASKA CATEGORY: ER					
CH-8005-00	Hallam Surveillance and Maintenance	64	16	64	16
Subtotal CH, HALLAM, NEBRASKA, ER		64	16	64	16
Subtotal CH, HALLAM, NEBRASKA		64	16	64	16
FIELD OFFICE: CH INSTALLATION: PIQUA, OHIO CATEGORY: ER					
CH-8004-00	Piqua Surveillance and Maintenance	20	20	20	20
Subtotal CH, PIQUA, OHIO, ER		20	20	20	20
Subtotal CH, PIQUA, OHIO		20	20	20	20
FIELD OFFICE: CH INSTALLATION: PRINCETON PLASMA PHYSICS LABORATORY CATEGORY: CA					
CH-3006-02	Underground Storage Tank Remediation	270	0	270	0
CH-3010-01	GROUNDWATER REMEDIATION PROJECT	0	0	0	0
Subtotal CH, PRINCETON PLASMA PHYSICS LABORATORY, CA		270	0	270	0
FIELD OFFICE: CH INSTALLATION: PRINCETON PLASMA PHYSICS LABORATORY CATEGORY: ER					
CH-3009-01	CHARACTERIZATION OF POTENTIAL GROUNDWATER CO	0	0	0	0
CH-3010-02	GROUNDWATER REMEDIATION PROJECT	0	0	0	0
Subtotal CH, PRINCETON PLASMA PHYSICS LABORATORY, ER		0	0	0	0
FIELD OFFICE: CH INSTALLATION: PRINCETON PLASMA PHYSICS LABORATORY CATEGORY: WM					
CH-3001-01	Improvements and Basin Liner	90	0	90	0
CH-3003-01	Low Level Radioactive Waste Disposal	23	65	23	142
CH-3004-01	RADIOACTIVE WASTE MANAGEMENT	8	16	8	16
CH-3005-01	Hazardous Waste Disposal	515	539	515	539
CH-3005-02	Hazardous Waste Disposal	0	0	0	0
CH-3006-01	Underground Storage Tank Remediation	0	0	0	0

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ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
CH-3008-01	Waste Minimization Program	14	27	14	27
CH-3011-01	STORMWATER DISCHARGE CHARACTERIZATION	0	0	0	240
CH-3012-01	MIXED WASTE DISPOSAL	0	67	0	67
CH-3013-01	HAZARDOUS WASTE MANAGEMENT	0	313	0	313
CH-3014-01	CONSTRUCTION OF NEW HAZARDOUS MATERIAL STORA	0	0	0	737
Subtotal CH, PRINCETON PLASMA PHYSICS LABORATORY, WM		650	1,027	650	2,081
Subtotal CH, PRINCETON PLASMA PHYSICS LABORATORY		920	1,027	920	2,081
Subtotal CH		59,717	63,750	59,717	104,501
FIELD OFFICE: FS INSTALLATION: FEED MATERIALS PRODUCTION CENTER CATEGORY: CA					
FS-1-A1	AIR QUALITY IMPROVEMENTS	0	0	0	0
FS-2-A2	WATER QUALITY IMPROVEMENTS	0	0	0	0
FS-5-HQ	FERNALD LITIGATION SETTLEMENT PAYMENT	0	0	0	0
Subtotal FS, FEED MATERIALS PRODUCTION CENTER, CA		0	0	0	0
FIELD OFFICE: FS INSTALLATION: FEED MATERIALS PRODUCTION CENTER CATEGORY: ER					
FS-4-B1	RI/FS - ALL OPERABLE UNITS	9,411	19,006	9,411	19,006
FS-8-B1	PROJECT MANAGEMENT	26,959	16,937	26,959	19,128
FS- 10-B4	RMI/FIELDS BROOK	5,820	16,488	5,820	16,488
FS- 16-C3	WASTE MANAGEMENT	28,878	47,742	28,878	49,742
FS- 30-B2	OEPA ENVIRONMENTAL MONITORING OVERSIGHT	1,500	1,500	1,500	1,500
FS- 37-A3	LITIGATION SETTLEMENT	0	0	0	0
FS- 46-B2	RESPONSE ACTION - OPERABLE UNIT 1	18,040	15,000	18,040	55,429
FS- 47-B2	RESPONSE ACTION - OPERABLE UNIT 2	10,475	15,750	10,475	31,043
FS- 48-B2	RESPONSE ACTION - OPERABLE UNIT 3	1,621	12,402	1,621	24,355
FS- 49-B2	RESPONSE ACTION - OPERABLE UNIT 4	0	8,500	0	8,500
FS- 50-B2	RESPONSE ACTION - OPERABLE UNIT 5	23,971	35,424	23,971	35,455
FS- 51-B2	RESPONSE ACTION - D & D	0	2,500	0	2,500
FS- 52-B2	REMEDIAL SUPPORT FACILITIES	14,738	15,425	14,738	66,134
FS- 60-D1	LITIGATION	12,540	13,100	12,540	13,100
FS- 64-D1	ENVIRONMENTAL MONITORING ACTIVITIES	16,738	18,760	16,738	21,560
FS- 68-D1	BASE SERVICES	39,477	48,375	39,477	55,213
FS- 69-D1	CERCLA SUPPORT	24,723	26,966	24,723	31,808
FS- 74-D2	SAFE SHUTDOWN	0	21,016	0	21,016
Subtotal FS, FEED MATERIALS PRODUCTION CENTER, ER		234,891	334,891	234,891	471,977
FIELD OFFICE: FS INSTALLATION: FEED MATERIALS PRODUCTION CENTER CATEGORY: WM					
FS-3-C1	RCRA COMPLIANCE ACTIVITIES	0	0	0	0
FS- 13-C1	WASTE MANAGEMENT UPGRADES	0	0	0	0
FS- 14-C1	CONTINUITY OF OPERATIONS	0	0	0	0
FS- 16-C4	LOW LEVEL WASTE TREATMENT	0	0	0	0
FS- 19-C4	LOW LEVEL WASTE STORAGE	0	0	0	0
FS- 20-C5	RCRA/MIXED WASTE DISPOSITION	0	0	0	0
FS- 31-C5	LOW LEVEL WASTE DISPOSAL	0	0	0	0
FS- 33-C2	WASTE MINIMIZATION IMPLEMENTATION	0	0	0	0
FS- 34-C2	WASTE MINIMIZATION PLANNING	0	0	0	0
Subtotal FS, FEED MATERIALS PRODUCTION CENTER, WM		0	0	0	0
Subtotal FS, FEED MATERIALS PRODUCTION CENTER		234,891	334,891	234,891	471,977
Subtotal FS		234,891	334,891	234,891	471,977
FIELD OFFICE: HQ INSTALLATION: HEADQUARTERS CATEGORY: ER					
HQ-2-00	Technical support to Environmental Restorati	965	14,033	965	11,826
HQ-3-00	Technical Support to Environmental Restorati	2,815	5,700	2,815	5,130
HQ-4-00	Technical Support Services to FUSRAP	550	550	550	550
HQ-5-00	GENERAL SUPPORT SERVICES FOR FUSRAP	400	165	400	165
HQ- 13-00	Technical Support Services for UMTRAP	760	620	760	620
HQ- 15-00	General Support Services	200	200	200	500
HQ- 16-00	General Support Services	200	200	200	500
HQ- 100-AA	TECHNICAL SUPPORT ENVIRONMENTAL RESTORATION	24,329	14,798	24,314	61,303

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ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
HQ- 100-AB	Technical Support to Environmental Restorati	2,000	500	2,000	2,000
HQ- 109-xa	General Support Services	500	500	500	3,400
HQ- 199-18	PROGRAM DIRECTION	31,833	32,100	31,833	45,000
HQ-2406-19	Maxey Flats Disposal Site	4,000	2,000	4,000	10,000
HQ-8001-	AGENCIES METHODOLOGY R&D (VPI)	1,942	1,846	1,942	1,846
Subtotal HQ, HEADQUARTERS, ER		70,494	73,212	70,479	142,840
FIELD OFFICE: HQ INSTALLATION: HEADQUARTERS CATEGORY: PD					
HQ- 300-EM	Program Direction	24,749	27,223	24,749	52,152
Subtotal HQ, HEADQUARTERS, PD		24,749	27,223	24,749	52,152
FIELD OFFICE: HQ INSTALLATION: HEADQUARTERS CATEGORY: TD					
HQ-7643-	Technology Development	151,012	149,570	151,012	236,929
HQ-9001-TD	Technology Development	76,028	109,428	76,028	144,371
HQ-9002-TD	Technology Development	90,608	89,742	90,608	142,157
HQ-9003-TD	Program Direction	10,600	12,333	10,600	15,000
Subtotal HQ, HEADQUARTERS, TD		328,248	361,073	328,248	538,457
FIELD OFFICE: HQ INSTALLATION: HEADQUARTERS CATEGORY: WM					
HQ-3030-01	SUPPORT FOR THE OFFICE OF WASTE OPERATIONS (	18,700	18,653	18,700	56,373
HQ-3030-02	SUPPORT FOR THE HANFORD PROGRAM OFFICE	8,000	6,000	8,000	15,000
HQ-3030-04	SUPPORT FOR THE OFFICE OF WASTE OPERATIONS -	8,775	5,433	8,775	5,433
HQ-3030-O3	HIGH-LEVEL WASTE DISPOSAL FEE	0	0	0	5,000
HQ-3031-01	PROGRAM DIRECTION	67,747	71,324	67,747	96,700
HQ-3032-01	SUPPORT FOR THE SITE OPERATIONS DIVISION	15,700	9,610	15,700	37,400
HQ-3032-02	WASTE ANALYTICAL LABORATORY	0	0	0	10,000
HQ-3032-03	RADIOACTIVE MIXED WASTE TREATMENT FACILITY	0	0	0	17,800
HQ-3033-01	Support to the Division of Program Support	8,800	11,100	8,800	16,150
HQ-3034-01	SUPPORT TO THE WASTE MANAGEMENT PROJECTS DIV	5,000	7,067	5,000	12,000
HQ-3034-03	PROJECTS TECHNICAL SUPPORT - NON-DEFENSE	0	0	0	630
HQ-3035-01	SUPPORT TO THE TECHNICAL SUPPORT DIVISION -	1,900	4,500	1,900	5,100
HQ-3035-02	NATIONAL LOW-LEVEL WASTE PROGRAM	8,525	6,000	8,525	6,000
Subtotal HQ, HEADQUARTERS, WM		143,147	139,687	143,147	283,586
Subtotal HQ, HEADQUARTERS		566,638	601,195	566,623	1,017,035
Subtotal HQ		566,638	601,195	566,623	1,017,035
FIELD OFFICE: ID INSTALLATION: GRAND JUNCTIONS PROJECT OFFICE CATEGORY: ER					
ID-2101-GA	MONTICELLO REMEDIAL ACTION PROJECT (MRAP) -	8,682	11,774	8,682	20,341
ID-2102-GA	MONTICELLO REMEDIAL ACTION PROJECT - STATE G	45	45	45	45
ID-2103-GA	MONTICELLO REMEDIAL ACTION PROJECT (MRAP)-RE	0	0	0	0
ID-2104-GA	MONTICELLO SURFACE AND GROUND WATER REMEDIAT	273	304	273	304
ID-2110-GA	MONTICELLO VICINITY PROPERTIES (MVP)	3,000	4,000	3,000	4,000
ID-2120-GA	GRAND JUNCTION PROJECTS OFFICE REMEDIAL ACTI	4,723	300	4,723	300
ID-2200-GA	UMTRA INACTIVE MILLSITES; TMC	864	364	864	364
ID-2201-GA	GRAND JUNCTION VICINITY PROPERTIES PROJECT (	32,810	27,604	32,810	27,604
ID-2250-GA	INDEPENDENT VERIFICATION and CERTIFICATION S	0	300	0	300
ID-2260-GA	TECHNICAL NEEDS ASSESSMENT	0	0	0	0
ID-2300-GA	LONG-TERM SURVEILLANCE AND MAINTENANCE - MAN	706	907	706	907
ID-2301-GA	LONG-TERM SURVEILLANCE AND MAINTENANCE	0	0	0	0
ID-2302-GA	LONG-TERM SURVEILLANCE AND MAINTENANCE - 151	0	0	0	0
ID-2305-GA	PRE-LICENSING CUSTODIAL CARE	250	150	250	150
ID-2310-GA	FORMERLY UTILIZED SITES REMEDIAL ACTION PROG	0	0	0	0
ID-2400-GA	GRAND JUNCTION PROJECTS OFFICE LANDLORD SUPP	0	0	0	5,310
Subtotal ID, GRAND JUNCTIONS PROJECT OFFICE, ER		51,353	45,748	51,353	59,625
Subtotal ID, GRAND JUNCTIONS PROJECT OFFICE		51,353	45,748	51,353	59,625

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ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
FIELD OFFICE: ID INSTALLATION: IDAHO CHEMICAL PROCESSING PLANT CATEGORY: CA					
ID-1014-C1	LIQUID EFFLUENT TREATMENT & DISPOSAL	0	0	0	0
ID-1018-C1	UNDERGROUND STORAGE TANKS	0	0	0	0
ID-1028-C1	ENVIRONMENTAL CORRECTIONS ACTIVITIES	7,000	0	7,000	0
ID-1028-CH	ENVIRONMENTAL CORRECTIONS ACTIVITIES	0	0	0	0
Subtotal ID, IDAHO CHEMICAL PROCESSING PLANT, CA		7,000	0	7,000	0
FIELD OFFICE: ID INSTALLATION: IDAHO CHEMICAL PROCESSING PLANT CATEGORY: ER					
ID-1201-C1	ENVIRONMENTAL RESTORATION - ASSESSMENT	2,436	3,582	2,436	4,570
ID-1202-C1	ENVIRONMENTAL RESTORATION - CLEANUP	2,052	1,020	2,052	2,475
ID-1203-C1	ENVIRONMENTAL RESTORATION - PROJECT MANAGEME	1,512	1,398	1,512	1,500
ID-1301-C1	ICPP SURVEILLANCE & MAINTENANCE - D&D	200	200	200	200
ID-1302-C1	ICPP ASSESSMENT - D&D	380	400	380	400
ID-1303-C1	ICPP CLEANUP - D&D	420	400	420	400
Subtotal ID, IDAHO CHEMICAL PROCESSING PLANT, ER		7,000	7,000	7,000	9,545
FIELD OFFICE: ID INSTALLATION: IDAHO CHEMICAL PROCESSING PLANT CATEGORY: WM					
ID-1001-C1	PLANT SERVICES	2,335	2,569	2,335	3,429
ID-1002-C1	HIGH-LEVEL WASTE AND STORAGE AND TREATMENT	29,010	21,640	29,010	23,416
ID-1003-C1	CALCINE STORAGE OPERATIONS	0	700	0	1,930
ID-1004-C1	HLW TANK FARM REPLACEMENT-PHASE I	32,740	61,150	32,740	62,620
ID-1005-C1	RADIOACTIVE & HAZARDOUS WASTE DISPOSITION	2,110	2,321	2,110	2,321
ID-1006-C1	ENVIRONMENTAL CORRECTIONS ACTIVITIES	0	6,780	0	6,780
ID-1008-C1	PEW EVAPORATOR REPLACEMENT	1,965	4,550	1,965	4,550
ID-1009-C1	CPP-603 BASIN WATER DISPOSAL	0	0	0	0
ID-1015-C1	NOx ABATEMENT	7,480	7,320	7,480	7,320
ID-1019-C1	HLW TANK FARM REPLACEMENT - PHASE II	940	1,470	940	1,470
ID-1022-C1	MIXED WASTE RULE MONITORING (IRTS)	2,000	2,200	2,000	3,200
ID-1023-C1	SERVICE WASTE CLOSED LOOP COOLING WATER SYST	0	0	0	0
ID-1030-C1	IMPLEMENT NEWLY ISSUED DOE ORDERS	3,619	4,000	3,619	6,680
ID-1032-C1	FILTER LEACH SYSTEM UPGRADE, MW	200	400	200	400
ID-1035-C1	OSHA CORRECTIONS	0	830	0	830
ID-1036-C1	WASTE CALCINE FACILITY PRE-DECONT.& STABILIZ	600	600	600	690
ID-1037-C1	INCREASED NWCF CAPACITY	0	0	0	0
ID-1038-C1	ASBESTOS ABATEMENT PROJECT	0	0	0	0
ID-1039-C1	ICPP SITE-SPECIFIC EIS/NEPA ACTIVITIES	1,000	837	1,000	837
ID-1040-C1	LIQUID EFFLUENT TREATMENT & DISPOSAL	760	330	760	330
ID-1041-C1	OPERATIONAL SUPPORT	1,350	2,000	1,350	2,000
ID-1042-C1	PLANT UTILITIES	2,510	2,660	2,510	2,660
ID-1045-C1	WASTE MINIMIZATION/POLLUTION PREVENTION	0	250	0	300
ID-1047-C1	WASTE TREATMENT AND BLOWER BUILDING	0	0	0	0
ID-1049-C1	ENVIRONMENTAL COMPLIANCE	1,350	1,460	1,350	1,460
ID-1050-C1	TIGER TEAM, AUDITS, SELF ASSESSMENT COSTS	0	0	0	0
ID-1051-C1	ENGINEERING & GRAPHICS SUPPORT	1,866	2,100	1,866	2,600
ID-1053-C1	SAFETY	2,560	2,800	2,560	3,030
ID-1054-C1	QUALITY ASSURANCE	2,380	2,400	2,380	2,510
ID-1055-C1	WASTE PROCESS DEVELOPMENT	1,820	2,000	1,820	2,100
ID-1057-C1	GPP/CE CONCEPTUAL DESIGN, STARTUP, AND PROJE	1,250	1,790	1,250	1,790
ID-1058-C1	NOx REMOVAL PROCESS DEVELOPMENT	240	0	240	0
ID-1059-C1	TANK FARM/CALCINE STORAGE, MW	1,870	1,830	1,870	1,830
ID-1060-C1	PROCESS VERFICATION CONSTRUCTION	0	500	0	500
ID-1071-C1	ICPP WASTE SIDE GENERAL PLANT PROJECTS	0	3,000	0	3,000
Subtotal ID, IDAHO CHEMICAL PROCESSING PLANT, WM		101,955	140,487	101,955	150,583
Subtotal ID, IDAHO CHEMICAL PROCESSING PLANT		115,955	147,487	115,955	160,128
FIELD OFFICE: ID INSTALLATION: IDAHO NATIONAL ENGINEERING LAB CATEGORY: CA					
ID- 11-E1	MIXED WASTE COMPLIANCE (IRTS)	0	0	0	0
ID- 102-E1	ACTIVE REGULATED UNDERGROUND STORAGE TANKS	0	0	0	0
Subtotal ID, IDAHO NATIONAL ENGINEERING LAB, CA		0	0	0	0

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ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
FIELD OFFICE: ID INSTALLATION: IDAHO NATIONAL ENGINEERING LAB CATEGORY: ER					
ID- 24-E1	TAN CIVILIAN SPENT FUEL STORAGE	0	0	0	0
ID- 28-E1	ASSESSMENT OF TAN	931	2,275	931	3,688
ID- 28-E2	CLEANUP OF TAN	0	68	0	68
ID- 29-E1	TECHNICAL SUPPORT & INTEGRATION	3,245	3,150	3,245	4,604
ID- 29-E2	QUALITY & COMPLIANCE ASSURANCE	1,635	1,822	1,635	2,414
ID- 29-E3	PROGRAM PLANNING, TRAINING, USGS, & MISC SUP	400	600	400	600
ID- 29-E4	DATA & SAMPLE MANAGEMENT	2,800	2,486	2,800	3,891
ID- 30-E1	ASSESSMENT OF TRA	5,425	2,945	5,425	4,900
ID- 30-E2	CLEANUP OF TRA	3,525	500	3,525	500
ID- 34-E1	ASSESSMENT OF CFA	1,020	2,960	1,020	2,960
ID- 34-E2	CLEANUP OF CFA	265	0	265	0
ID- 36-E1	ASSESSMENT OF PBF/ARA	1,079	530	1,079	530
ID- 36-E2	CLEANUP OF PBF/ARA	195	281	195	281
ID- 38-E1	ASSESSMENT OF EBR-1/BORAX	0	0	0	0
ID- 38-E2	CLEANUP OF EBR-1/BORAX	0	137	0	137
ID- 40-E1	BURIED WASTE PROGRAM - ASSESSMENT	11,040	10,313	11,040	18,415
ID- 40-E2	BURIED WASTE PROGRAM - CLEANUP	1,920	5,814	1,920	5,814
ID- 41-E1	ASSESSMENT OF MISCELLANEOUS UNITS	1,870	1,500	1,870	5,255
ID- 41-E2	CLEANUP OF MISCELLANEOUS UNITS	0	410	0	410
ID- 43-E1	HQ SUPPORT	0	0	0	0
ID- 45-E1	D&D SURVEILLANCE AND MAINTENANCE	315	330	315	330
ID- 46-E1	ARVFS/NAK D&D CLEANUP	0	0	0	0
ID- 47-E1	INEL D&D PROGRAM SUPPORT	160	165	160	165
ID- 48-E1	ARA II ASSESSMENT	0	0	0	0
ID- 48-E2	ARA II CLEANUP	430	640	430	640
ID- 49-E1	ARA III ASSESSMENT	0	0	0	0
ID- 49-E2	ARA III CLEANUP	500	520	500	520
ID- 50-E1	WRRTF HOT WASTE TANK ASSESSMENT	120	0	120	0
ID- 50-E2	WRRTF HOT WASTE TANK CLEANUP	90	170	90	170
ID- 52-E1	ARA I ASSESSMENT	200	0	200	0
ID- 52-E2	ARA I CLEANUP	0	470	0	470
ID- 53-E1	TAN 607 DECON SHOP ASSESSMENT	0	0	0	0
ID- 53-E2	TAN 607 DECON SHOP CLEANUP	0	0	0	0
ID- 54-E1	MTR ASSESSMENT	150	115	150	115
ID- 54-E2	MTR CLEANUP	0	0	0	0
ID- 58-E1	CFA-669 HOT LAUNDRY ASSESSMENT	0	0	0	0
ID- 58-E2	CFA-669 HOT LAUNDRY CLEANUP	410	0	410	0
ID- 60-E1	ETR ASSESSMENT	125	90	125	90
ID- 60-E2	ETR CLEANUP	0	0	0	0
ID- 63-E1	BORAX-V	1,040	700	1,040	700
ID- 64-E1	SPERT-IV WASTE HOLDUP TANK & PIPING	0	0	0	0
ID- 65-E1	LOFT ANCILLARY EQUIPMENT ASSESSMENT	0	0	0	0
ID- 65-E2	LOFT ANCILLARY EQUIPMENT CLEANUP	350	0	350	0
ID- 67-E1	TTAF ASSESSMENT	410	135	410	135
ID- 67-E2	TTAF CLEAN-UP	0	965	0	965
ID- 102-E3	INACTIVE UNDERGROUND STORAGE TANKS	1,450	700	1,450	700
ID- 103-E1	ENVIRONMENTAL RESTORATION TIGER TEAM	200	500	200	500
ID- 110-E1	DOE SUPPORT	6,577	6,577	6,577	6,842
ID- 110-E2	DOE SUPPORT	0	9	0	0
ID- 112-E1	INTERAGENCY AGREEMENT (IAG)	2,000	2,000	2,000	2,000
ID- 112-E2	DOE - SHOSHONE BANNOCK	200	200	200	200
Subtotal ID, IDAHO NATIONAL ENGINEERING LAB, ER		50,077	50,077	50,077	69,009
FIELD OFFICE: ID INSTALLATION: IDAHO NATIONAL ENGINEERING LAB CATEGORY: LD					
ID- 114-10	WILLOW CREEK BUILDING (WCB) BUYOUT	0	0	0	0
ID- 114-14	GENERAL PLANT PROJECTS, LANDLORD	6,481	7,325	6,481	8,825
ID- 114-15	GENERAL PLANT PROJECTS, LANDLORD (CONT.)	0	0	0	0
ID- 114-16	TRA FIRE AND LIFE SAFETY IMPROVEMENTS	225	0	225	0
ID- 114-17	RADIOLOGICAL AND ENVIRONMENTAL SCIENCES LAB	180	50	180	50
ID- 114-18	CENTRAL FACILITIES AREA (CFA) OFFICE BUILDIN	0	190	0	190
ID- 114-19	INEL TRAINING FACILITY	0	170	0	170
ID- 114-20	SYSTEM ANALYSIS FACILITY (SAF) NO. 2	0	185	0	185

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ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
ID- 114-21	TEST REACTOR AREA (TRA) OFFICE COMPLEX	0	0	0	0
ID- 114-22	OUTYEAR LINE ITEMS	0	340	0	340
ID- 114-E1	INEL LANDLORD INFRASTRUCTURE SUPPORT	20,735	18,380	20,735	26,689
ID- 114-E2	INEL LANDLORD INFRASTRUCTURE SUPPORT (CONT.)	0	0	0	0
ID- 114-E3	INEL ROAD RENOVATION	0	0	0	0
ID- 114-E4	INEL TRANSPORTATION COMPLEX	895	5,860	895	5,860
ID- 114-E5	INEL SEWER SYSTEM UPGRADE	2,100	3,700	2,100	3,700
ID- 114-E6	INEL FIRE AND LIFE SAFETY IMPROVEMENTS	3,000	8,000	3,000	8,000
ID- 114-E7	INEL RADIO COMMUNICATIONS UPGRADE (TRUNKING	150	50	150	50
ID- 114-E8	INEL ELECTRICAL UPGRADE	80	1,000	80	1,000
ID- 114-E9	INEL RESEARCH CENTER LABORATORY No. 2	275	50	275	50
Subtotal ID, IDAHO NATIONAL ENGINEERING LAB, LD		34,121	45,300	34,121	55,109
FIELD OFFICE: ID INSTALLATION: IDAHO NATIONAL ENGINEERING LAB CATEGORY: WM					
ID-1-E1	LLW TREATMENT (WERF)	5,474	8,510	5,474	9,222
ID-2-E1	RWMC LLW OPERATIONS	4,335	5,500	4,335	6,652
ID-2-E2	RWMC LLW TECHNOLOGY PROGRAMS	928	1,020	928	1,020
ID-3-E1	IMPLEMENTATION OF 5820.2A CHAPTER III (LLW)	3,834	2,000	3,834	2,700
ID-4-E1	RADIOACTIVE WASTE TECHNICAL SUPPORT PROGRAM	0	0	0	0
ID-5-E1	MIXED AND LLW DISPOSAL SYSTEM (NEW)	120	615	120	615
ID-5-E2	MIXED AND LOW LEVEL TREATMENT FACILITY (NEW)	2,000	2,500	2,000	2,950
ID-6-E1	DOE COMPLIANCE	624	2,200	624	2,500
ID-7-E1	OPERATIONS SUPPORT	3,525	3,900	3,525	4,000
ID-8-E1	TRU OPERATIONS	4,948	5,412	4,948	6,000
ID-8-E2	TRU TECHNICAL PROGRAMS	2,834	5,200	2,834	5,498
ID-8-E3	TRU EXAMINATION, CERTIFICATION, VENTING	3,231	2,574	3,231	2,574
ID-8-E5	TRU RETRIEVAL OPERATIONS	0	2,269	0	2,269
ID-8-E6	MOBILE NDE/NDA SYSTEM	0	0	0	0
ID-8-E8	WIPP UNCERTAINTIES	0	0	0	0
ID-9-E1	SAR UPGRADES	0	1,688	0	1,688
ID- 10-E1	PREPP STANDBY	221	245	221	245
ID- 11-E2	MIXED WASTE COMPLIANCE (IRTS)	5,310	6,575	5,310	8,075
ID- 12-E1	INDEPENDENT SAFETY REVIEW COMMITTEE	787	900	787	1,000
ID- 14-E1	IDAHO WASTE PROCESSING FACILITY (IWPF)	3,393	6,363	3,393	10,256
ID- 14-E2	CONTINUED FROM 14-E1 (IWPF)	0	0	0	0
ID- 15-E1	PLANNING AND INTEGRATION	2,105	2,150	2,105	2,653
ID- 16-E1	SITE ENVIRONMENTAL MONITORING	7,196	5,500	7,196	5,501
ID- 17-E1	WASTE ENGINEERING DEVELOPMENT	1,824	3,000	1,824	3,635
ID- 18-E1	HAZARDOUS AND MIXED WASTE SUPPORT	675	1,000	675	1,282
ID- 19-E1	ISU MONITORING	162	170	162	170
ID- 19-E2	STATE MONITORING AGREEMENT	2,262	2,428	2,262	2,428
ID- 19-E3	INEL SUPPORT TO THE STATE MONITORING AGREEME	692	633	692	1,159
ID- 20-E1	POLLUTION PREVENTION (Waste Minimization)	1,384	1,500	1,384	1,950
ID- 21-E1	HAZARDOUS WASTE TREATMENT FACILITY	0	150	0	150
ID- 22-E1	WASTE MANAGEMENT OPERATIONS DEPARTMENT GENER	2,506	6,762	2,506	6,826
ID- 23-E1	TIGER TEAM	0	0	0	0
ID- 25-E1	LONG-TERM STORAGE OF TMI-2 FUEL	4,107	6,500	4,107	7,280
ID- 43-E2	HQ SUPPORT PROGRAMS FOR OFFICE OF WASTE MANA	0	0	0	0
ID- 69-E1	TRANSPORTATION COMPLIANCE SYSTEM	1,230	2,000	1,230	5,354
ID- 71-E1	SANITARY WASTE/TRANSFER STATION	10,595	350	10,595	435
ID- 76-E1	WASTE MANAGEMENT NEPA	2,356	4,000	2,356	8,000
ID- 101-E1	TSA RETRIEVAL ENCLOSURE FACILITY	5,390	2,140	5,390	2,140
ID- 101-E2	WASTE CHARACTERIZATION AND STORAGE FACILITY	26,377	34,500	26,377	46,300
ID- 102-E2	ACTIVE REGULATED UNDERGROUND STORAGE TANKS	1,696	3,030	1,696	3,030
ID- 102-E4	ACTIVE NON-REGULATED UNDERGROUND STORAGE TAN	0	970	0	2,470
ID- 113-E1	SUPPORT TO WIPP	0	0	0	0
ID- 113-E2	QUALITY ASSURANCE PROGRAM PLAN (QAPP) FOR WI	0	0	0	0
Subtotal ID, IDAHO NATIONAL ENGINEERING LAB, WM		112,121	134,254	112,121	168,027
Subtotal ID, IDAHO NATIONAL ENGINEERING LAB		196,319	229,631	196,319	292,145

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ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
FIELD OFFICE: ID INSTALLATION: WEST VALLEY CATEGORY: WM					
ID-4001-WV	West Valley Demonstration Project	104,000	124,000	104,000	134,000
Subtotal ID, WEST VALLEY, WM		104,000	124,000	104,000	134,000
Subtotal ID, WEST VALLEY		104,000	124,000	104,000	134,000
Subtotal ID		467,627	546,866	467,627	645,898
FIELD OFFICE: NV INSTALLATION: NEVADA OFF-SITE LOCATIONS CATEGORY: ER					
NV- 214-AA	OFF-SITE LOCATION CERCLA PROGRAMS - MS	900	744	900	744
NV- 227-AA	OFF-SITE LOCATION CERCLA REMEDIATION - MS	0	0	0	0
NV- 230-AA	COMPLIANCE OVERSIGHT - AK	0	0	0	260
NV- 235-AA	COMPLIANCE OVERSIGHT - MS	250	260	250	260
NV- 243-AA	OFF-SITE LOCATION CERCLA PROGRAMS - NV	250	260	250	416
NV- 244-AA	OFF-SITE LOCATION CERCLA PROGRAMS - AK	0	0	0	416
NV- 245-AA	OFF-SITE LOCATION CERCLA PROGRAMS - CO	0	0	0	208
NV- 246-AA	OFF-SITE LOCATION CERCLA PROGRAMS - NM	0	0	250	208
NV- 247-AA	OFF-SITE LOCATION CERCLA REMEDIATION - NV	0	0	0	0
NV- 248-NV	OFF-SITE LOCATION CERCLA REMEDIATION - AK	0	0	0	0
NV- 249-AA	OFF-SITE LOCATION CERCLA REMEDIATION - CO	0	0	0	0
NV- 250-AA	OFF-SITE LOCATION CERCLA REMEDIATION - NM	0	0	0	0
Subtotal NV, NEVADA OFF-SITE LOCATIONS, ER		1,400	1,264	1,650	2,512
FIELD OFFICE: NV INSTALLATION: NEVADA OFF-SITE LOCATIONS CATEGORY: WM					
NV- 231-AA	COMPLIANCE OVERSIGHT - CO	0	260	0	260
NV- 236-AA	COMPLIANCE OVERSIGHT - NM	0	260	0	260
Subtotal NV, NEVADA OFF-SITE LOCATIONS, WM		0	520	0	520
Subtotal NV, NEVADA OFF-SITE LOCATIONS		1,400	1,784	1,650	3,032
FIELD OFFICE: NV INSTALLATION: NEVADA TEST SITE CATEGORY: CA					
NV- 101-AA	POTABLE WATER SYSTEM PROTECTION	0	0	0	0
NV- 102-AA	EMPLACEMENT OF SURVEYED FENCING OF ACTIVE LA	0	0	0	0
NV- 102-AB	EMPLACEMENT OF SURVEYED FENCING OF ACTIVE LA	195	0	195	0
NV- 103-AA	SEWAGE SYSTEM UPGRADE	0	0	0	0
NV- 105-AA	ENVIRONMENTAL PROTECTION PROGRAM/DOE ORDER 5	0	0	0	0
NV- 105-AB	ENVIRONMENTAL PROTECTION PROGRAM/DOE ORDER 5	1,300	0	1,300	0
NV- 106-AA	RADIATION PROTECTION/DOE DRAFT ORDER 5400.5	0	0	0	0
NV- 107-AA	STEAM CLEANING EFFLUENT DISPOSAL	0	0	0	0
NV- 108-AA	ABANDONED SEPTIC TANKS	165	0	165	0
Subtotal NV, NEVADA TEST SITE, CA		1,660	0	1,660	0
FIELD OFFICE: NV INSTALLATION: NEVADA TEST SITE CATEGORY: ER					
NV- 201-AA	PROGRAM SUPPORT	1,000	1,041	1,000	1,041
NV- 202-AA	GROUNDWATER CHARACTERIZATION AT THE NTS	21,860	22,818	21,610	28,267
NV- 203-AA	ACTIVE TUNNEL POND/MUCKPILE ASSESSMENT	500	208	500	208
NV- 204-AA	YUCCA FLAT RI/FS	300	816	300	937
NV- 205-AA	FRENCHMAN FLAT RI/FS	0	0	0	211
NV- 206-AB	PAHUTE MESA RI/FS	780	677	780	677
NV- 207-AA	RAINIER MESA RI/FS	0	0	0	271
NV- 208-AA	SHOSHONE MOUNTAIN RI/FS	0	0	0	0
NV- 209-AA	SUMP AND INJECTION WELL RI/FS	0	0	0	208
NV- 210-AA	INACTIVE TANK RI/FS	250	260	250	260
NV- 211-AA	CONTAMINATED WASTE SITE RI/FS	0	0	0	416
NV- 212-AA	LEACHFIELD RI/FS	0	0	0	0
NV- 213-AA	INACTIVE MUCKPILE AND TUNNEL PONDS RI/FS	0	0	0	416
NV- 215-AA	RI/FS AT THE NTS, TTR, AND NAFR AREA 13	200	52	200	52
NV- 216-AA	CLOSURE PLAN DEVELOPMENT/IMPLEMENTATION AT N	770	21	770	21
NV- 217-AA	PU CONTAMINATED SOIL CLEAN-UP AT TTR	0	0	0	0
NV- 218-AA	PU-CONTAMINATED SOIL CLEAN-UP ON THE NTS	0	0	0	0
NV- 219-AA	PU-CONTAMINATED SOIL CLEAN-UP AT NAFR AREA 1	0	0	0	20,820
NV- 220-AA	ACTIVE TUNNEL POND AND MUCKPILE CLOSURE	0	0	0	0
NV- 221-AA	SUMP AND INJECTION WELL REMEDIATION	0	0	0	0

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ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
NV- 222-AA	INACTIVE TANK REMEDIATION	0	0	0	0
NV- 223-AA	LEACHFIELD REMEDIATION	0	0	0	0
NV- 224-AA	INACTIVE MUCKPILE & TUNNEL POND REMEDIATION	0	0	0	0
NV- 225-AA	D&D SURVEILLANCE AND PLANNING	210	10	210	10
NV- 226-AA	COMPLIANCE OVERSIGHT - NV	1,000	1,250	1,000	1,250
NV- 228-AA	ATMOSPHERIC TESTING/DEBRIS DISPOSAL COMPLIAN	0	0	0	0
NV- 229-AA	POST-EVENT LOCATION CHARACTERIZATION	250	260	250	947
NV- 232-AA	D&D IMPLEMENTATION	0	0	0	0
NV- 234-AA	ATMOSPHERIC TESTING DEBRIS DISPOSAL REMOVAL	0	0	0	833
NV- 237-AA	CLOSURE PLAN IMPLEMENTATION AT NTS	730	833	730	1,541
NV- 238-AA	FEDERAL COMPLIANCE OVERSIGHT - NV	350	208	350	208
NV- 239-AA	FEDERAL COMPLIANCE OVERSIGHT - AK	0	0	0	26
NV- 241-AA	FEDERAL COMPLIANCE OVERSIGHT - MS	10	10	25	26
NV- 251-AA	ABANDONED SEPTIC TANKS	0	0	0	0
NV- 260-AA	PROGRAM DIRECTION - ENVIRONMENTAL RESTORATIO	0	0	0	0
Subtotal NV, NEVADA TEST SITE, ER		28,210	28,464	27,975	58,646
FIELD OFFICE: NV INSTALLATION: NEVADA TEST SITE CATEGORY: WM					
NV- 240-AA	FEDERAL COMPLIANCE OVERSIGHT - CO	0	26	0	26
NV- 242-AA	FEDERAL COMPLIANCE OVERSIGHT - NM	0	26	0	26
NV- 301-AA	OPERATIONS AND MAINTENANCE SUPPORT	3,696	3,053	3,696	5,092
NV- 302-AA	NTS LOW-LEVEL WASTE DISPOSAL	817	910	817	1,120
NV- 303-AA	REGULATORY SUPPORT AND ADMINISTRATION	2,175	950	2,175	1,400
NV- 304-AA	NTS MIXED WASTE DISPOSAL	1,085	1,700	1,085	4,326
NV- 305-AA	TRANSURANIC WASTE STORAGE	811	400	811	815
NV- 307-AA	HAZARDOUS WASTE ACCUMULATION	428	500	428	940
NV- 308-AA	ENVIRONMENTAL MONITORING AND ASSESSMENT	2,207	1,516	2,207	2,570
NV- 309-AA	NV WO/CA PROGRAM MANAGEMENT	1,800	1,800	1,800	1,800
NV- 315-AA	NV WASTE MINIMIZATION PROGRAM	700	600	700	1,000
NV- 319-AA	NTS LIQUID WASTE TREATMENT	0	1,700	0	1,700
NV- 321-AA	RCRA STORAGE FACILITY	100	450	100	450
NV- 325-AA	STEAM CLEANING EFFLUENT DISPOSAL	0	259	0	259
Subtotal NV, NEVADA TEST SITE, WM		13,819	13,890	13,819	21,524
Subtotal NV, NEVADA TEST SITE		43,689	42,354	43,454	80,170
Subtotal NV		45,089	44,138	45,104	83,202
FIELD OFFICE: OR INSTALLATION: FORMERLY UTILIZED SITES REMEDIAL A CATEGORY: ER					
OR- 101-AA	Assessment	1,300	252	1,300	252
OR- 102-AA	Cleanup	14,404	11,413	14,404	11,413
OR- 103-AA	Assessment	6,610	991	6,610	991
OR- 104-AA	Cleanup	6,796	7,986	6,796	7,986
OR- 105-AA	Assessment	1,841	1,397	1,841	1,397
OR- 106-AA	Cleanup	5,160	6,541	5,160	6,541
OR- 107-AA	Assessment	4,397	428	4,397	428
OR- 108-AA	Cleanup	4,992	8,892	4,992	8,892
Subtotal OR, FORMERLY UTILIZED SITES REMEDIAL A, ER		45,500	37,900	45,500	37,900
Subtotal OR, FORMERLY UTILIZED SITES REMEDIAL A		45,500	37,900	45,500	37,900
FIELD OFFICE: OR INSTALLATION: OAK RIDGE GASEOUS DIFFUSION PLANT CATEGORY: CA					
OR- 402-	INSTALLATION OF BOILER #9	0	0	0	0
OR- 403-	TOXICITY REDUCTION	11,193	0	11,193	0
OR- 404-	SEWAGE COLLECTION SYSTEM REHABILITATION	525	554	525	554
OR- 433-	NPDES MONITORING EQUIPMENT	890	0	890	0
Subtotal OR, OAK RIDGE GASEOUS DIFFUSION PLANT, CA		12,608	554	12,608	554
FIELD OFFICE: OR INSTALLATION: OAK RIDGE GASEOUS DIFFUSION PLANT CATEGORY: ER					
OR- 405-C2	BASELINE SURVEILLANCE & MAINTENANCE OF LEU G	7,960	8,358	7,960	9,445
OR- 405-G1	BASELINE SURVEILLANCE & MAINTENANCE OF HEU G	12,437	13,297	12,437	13,297
OR- 405-G2	BASELINE SURVEILLANCE & MAINTENANCE OF LEU G	7,958	8,358	7,958	8,358

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ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
OR- 406-C2	HAZARDOUS MAT. MGMT. FOR H&S OF PERSONNEL LE	858	1,799	858	1,799
OR- 406-G1	HAZARDOUS MAT. MGMT. FOR H&S OF PERSONNEL HE	5,901	6,212	5,901	7,030
OR- 406-G2	HAZARDOUS MAT. MGMT. FOR H&S OF PERSONNEL LE	858	1,799	858	1,799
OR- 407-CD	Surveillance and Maintenance of Former Centr	79	0	79	0
OR- 407-EW	Surveillance and Maintenance of Former Centr	1,552	2,590	1,552	2,590
OR- 408-CD	TOXIC SUBSTANCES CONTROL ACT (TSCA) INCINERA	0	0	0	0
OR- 408-EW	TOXIC SUBSTANCES CONTROL ACT (TSCA) INCINERA	0	0	0	0
OR- 409-CD	SLUDGE MANAGEMENT	0	10,518	0	16,204
OR- 409-EW	SLUDGE MANAGEMENT	7,665	10,518	7,665	16,204
OR- 410-CD	Hazardous Centrifuge Equipment & Materials S	63	0	63	0
OR- 410-EW	Hazardous Centrifuge Equipment & Materials S	654	1,610	654	1,610
OR- 411-CD	Main Plant Area - Assessments	6,189	12,182	6,189	12,182
OR- 411-EW	Main Plant Area - Assessments	5,938	12,182	5,938	12,182
OR- 412-CD	MAIN PLANT AREA - REMEDIATION	2,746	3,255	2,746	3,255
OR- 412-EW	MAIN PLANT AREA - REMEDIATION	275	3,256	275	3,256
OR- 413-CD	Off-Site Investigations	788	4,000	788	4,000
OR- 413-EW	Off-Site Investigations	3,600	4,000	3,600	4,000
OR- 414-C2	HAZARDOUS MAT. MGMT. TO ACHIEVE REG. COMPL.	14,486	5,469	14,486	7,729
OR- 414-CX	HAZARDOUS MAT. MGMT. TO ACHIEVE REG. COMPL.	2,198	0	2,198	0
OR- 414-CZ	HAZARDOUS MAT. MGMT. TO ACHIEVE REG. COMPL.	89	0	89	0
OR- 414-G1	HAZARDOUS MAT. MGMT. TO ACHIEVE REG. COMPL.	2,613	4,536	2,613	5,309
OR- 414-G2	HAZARDOUS MAT. MGMT. TO ACHIEVE REF. COMPL.	288	5,469	288	7,729
OR- 415-CD	PCB VENTILATION GASKET SPILL CONTROL & REMOV	4,190	2,458	4,190	5,860
OR- 415-CX	HAZ MTRL MGMNT TO ACHIEVE REG COMPL LEU GASE	818	0	818	0
OR- 415-GF	PCB VENTILATION GASKET SPILL CONTROL & REMOV	1,372	5,054	1,372	6,947
OR- 416-C2	ASSESSMENT ACTIVITIES IN SUPPORT OF LEU D&D	328	518	328	518
OR- 416-G1	ASSESSMENT ACTIVITIES IN SUPPORT OF HEU D&D	1,961	3,566	1,961	5,636
OR- 416-G2	ASSESSMENT ACTIVITIES IN SUPPORT OF LEU D&D	328	518	328	518
OR- 417-EW	Centrifuge Facilities Cleanup	0	0	0	4,930
OR- 418-C2	CONSTRUCTION OF D&D SUPPORT FACILITIES (LEU)	0	0	0	0
OR- 418-CX	HAZ MTRL MGMNT TO ACHIEVE REG COMP LEU GASEO	186	0	186	0
OR- 418-G1	CONSTRUCTION OF D&D SUPPORT FACILITIES (HEU)	0	200	0	1,111
OR- 418-G2	CONSTRUCTION OF D&D SUPPORT FACILITIES (LEU)	-186	0	-186	0
OR- 436-CD	Centrifuge Workers Study	0	0	0	0
OR- 437-CD	GROUNDWATER PROTECTION PROGRAM	1,858	628	1,858	961
OR- 437-EW	GROUNDWATER PROTECTION PROGRAM	186	628	186	962
OR- 438-EW	LANDLORD CAPITAL I	10,000	22,000	10,000	36,000
OR- 439-C2	RADIATION CONTAMINATION CONTROL FOR LEU GASE	919	1,167	919	2,267
OR- 439-G1	RADIATION CONTAMINATION CONTROL FOR HEU GASE	1,282	1,576	1,282	2,949
OR- 439-G2	RADIATION CONTAMINATION CONTROL FOR LEU GASE	919	1,167	919	2,267
OR- 440-C2	SPECIAL PROJECTS IN SUPPORT OF LEU BASELINE	2,144	1,540	2,144	2,934
OR- 440-G1	SPECIAL PROJECTS IN SUPPORT OF HEU BASELINE	1,127	1,189	1,127	1,650
OR- 440-G2	SPECIAL PROJECTS IN SUPPORT OF LEU BASELINE	928	1,540	928	2,934
OR- 441-CD	FEDERAL FACILITY AGREEMENT - Oak Ridge	0	7,123	0	7,525
OR- 441-EW	FEDERAL FACILITY AGREEMENT - Oak Ridge	0	7,123	0	7,525
OR- 441-EX	FEDERAL FACILITY AGREEMENT - Oak Ridge	0	193	0	193
OR- 442-EW	Oak Ridge Operations Scrap Metal Program Man	0	0	0	0
OR- 443-EW	LANDLORD CAPITAL II	0	0	0	34,000
OR- 444-C1	OAK RIDGE HYDROLOGIC SUPPORT PROGRAM	0	302	0	302
OR- 444-C2	Groundwater Protection Program - ORNL site	0	986	0	986
OR- 444-W1	OAK RIDGE HYDROLOGIC SUPPORT PROGRAM	0	0	0	3,423
OR- 444-W2	Groundwater Protection Program - ORNL site	0	0	0	9,153
OR- 444-X1	OAK RIDGE HYDROLOGIC SUPPORT PROGRAM	0	0	0	0
OR- 444-X2	Groundwater Protection Program - ORNL site	0	0	0	0
OR- 445-CD	Analytical Support Services	0	5,724	0	5,724
OR- 445-EW	Analytical Support Services	0	0	0	23,850
OR- 445-EX	Analytical Support Services	0	0	0	0
OR- 447-AA	SFMP REMEDIAL ACTION INFORMATION SUPPORT	105	110	105	110
OR- 447-AB	FUSRAP REMEDIAL ACTION INFORMATION SUPPORT	105	110	105	110
OR- 447-AC	UMTRAP REMEDIAL ACTION INFORMATION SUPPORT	0	110	0	110
OR- 447-AD	DEFENSE D&D PROGRAM REMEDIAL ACTION INFORMAT	100	110	100	110
OR- 448-CD	Central ER Operations and Technical Integrat	4,300	4,730	4,300	8,245

ACTIVITY DATA SHEETS
SORTED BY FIELD OFFICE, INSTALLATION, AND CATEGORY
(dollars in thousands)

ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
OR- 448-EW	Central ER Operations and Technical Integrat	15,518	10,070	15,518	30,543
OR- 448-EX	Central ER Operations and Technical Integrat	894	538	894	495
OR- 449-CD	CENTRAL DECONTAMINATION & DECOMMISSIONING	675	286	675	286
OR- 449-EW	CENTRAL DECONTAMINATION & DECOMMISSIONING	1,096	1,078	1,096	1,078
OR- 449-EX	CENTRAL DECONTAMINATION & DECOMMISSIONING	16	0	16	0
OR- 451-GF	EM-40 PROGRAM TECHNICAL SUPPORT	4,280	0	4,280	8,422
OR- 455-GF	ENVIRONMENTAL RESTORATION INFORMATION SYSTEM	0	0	0	1,927
OR- 459-GF	WASTE INFORMATION NETWORK SYSTEM OPERATION A	0	0	0	0
OR- 463-GF	PROGRAM SUPPORT - FACILITY AIRBORNE HAZARD A	0	0	0	1,937
OR- 490-CD	Process Plant Area—Assessments	0	994	0	1,168
R- 490-EW	Process Plant Area—Assessments	943	994	943	1,168
OR- 491-CD	External Plant Area—Assessments	1,932	5,387	1,932	8,729
OR- 491-EW	External Plant Area—Assessments	803	5,388	803	8,729
OR- 492-CD	Process Plant Area - Remediation	0	0	0	0
OR- 492-EW	Process Plant Area - Remediation	0	0	0	0
OR- 493-CD	External Plant Area - Remediation	0	0	0	0
OR- 493-EW	External Plant Process - Remediation	0	0	0	0
OR- 495-GF	PLANNING, BUDGET, & CONTROL INFORMATION SYST	0	0	0	0
Subtotal OR, OAK RIDGE GASEOUS DIFFUSION PLANT, ER		144,322	214,513	144,322	382,270
FIELD OFFICE: OR INSTALLATION: OAK RIDGE GASEOUS DIFFUSION PLANT CATEGORY: WM					
OR- 419-AA	WASTE STORAGE I - MW	0	0	0	0
OR- 419-CD	WASTE STORAGE I - MW	0	0	0	0
OR- 419-EW	WASTE STORAGE I - MW	4,168	7,500	4,168	13,133
OR- 420-CD	WASTE DISPOSAL I - MW	0	0	0	0
OR- 420-EW	WASTE DISPOSAL I - MW	998	1,039	998	1,039
OR- 421-	CENTRAL WASTE MANAGEMENT DIVISION OPERATIONS	7,480	5,587	7,480	5,587
OR- 422-	WASTE MINIMIZATION-MW	165	250	165	480
OR- 423-AA	WASTE TREATMENT I FOR MIXED WASTE - MW	0	0	0	0
OR- 423-CD	WASTE TREATMENT I FOR MIXED WASTE - MW	0	0	0	0
OR- 423-EW	WASTE TREATMENT I - MW	9,612	13,750	9,612	15,798
OR- 424-	LOW-LEVEL WASTE DISPOSAL FACILITIES (LINE IT	0	12,000	0	16,900
OR- 425-	OAK RIDGE FILTER TEST FACILITY	301	324	301	324
OR- 426-EW	TSCA INCINERATOR FOR MIXED WASTE (MW)	0	0	0	0
OR- 427-	WASTE STORAGE II-MW	103	250	103	1,552
OR- 429-	WASTE MANAGEMENT INSTRUMENTATION AND EQUIPME	0	2,000	0	3,610
OR- 434-	OAK RIDGE OPERATIONS SCRAP METAL MANAGEMENT	490	2,000	490	2,000
OR- 444-AA	CONTINUITY OF OPERATIONS	2,059	0	2,059	0
OR- 444-EW	CONTINUITY OF OPERATIONS	235	2,211	235	5,247
OR- 445-	K-1515 SANITARY WATER PLANT WASTE DISPOSAL	0	1,500	0	1,500
OR- 450-	TSCA INCINERATOR FOR MIXED WASTE (MW)	21,500	23,960	21,500	24,200
OR- 450-AA	TSCA INCINERATOR FOR MIXED WASTE	6,425	0	6,425	0
OR- 452-GF	WASTE MANAGEMENT INFORMATION SYSTEM	0	0	0	0
OR- 456-GF	WASTE MANAGEMENT OPERATIONS TECHNICAL SUPPOR	1,745	0	1,745	0
OR- 460-GF	WASTE MANAGEMENT WASTE MINIMIZATION TECHNICA	0	0	0	0
OR- 486-	CENTRAL WASTE MANAGEMENT	0	0	0	8,000
OR- 496-GF	PLANNING, BUDGET, & CONTROL INFORMATION SYST	0	0	0	0
OR- 497-GF	PLANNING, BUDGET, & CONTROL INFORMATION SYST	0	0	0	0
OR- 498-GF	WASTE INFORMATION NETWORK SYSTEM OPERATION A	0	0	0	0
OR- 499-GF	WASTE INFORMATION NETWORK SYSTEM OPERATION A	0	0	0	0
Subtotal OR, OAK RIDGE GASEOUS DIFFUSION PLANT, WM		55,281	72,371	55,281	99,370
Subtotal OR, OAK RIDGE GASEOUS DIFFUSION PLANT		212,211	287,438	212,211	482,194
FIELD OFFICE: OR INSTALLATION: OAK RIDGE NATIONAL LABORATORY CATEGORY: CA					
OR- 302-	Solid-LIP Bethel Valley; LLLW-CAT SYSTEM	3,311	0	3,311	0
OR- 304-	Melton Valley LLLW-CAT SYS. UPGRADE	3,968	16,400	3,968	16,400
OR- 310-AA	Subtitle I USTs	0	0	0	0
Subtotal OR, OAK RIDGE NATIONAL LABORATORY, CA		7,279	16,400	7,279	16,400
FIELD OFFICE: OR INSTALLATION: OAK RIDGE NATIONAL LABORATORY CATEGORY: ER					
OR- 311-AA	WAG Surveillance and Maintenance - EW	2,892	3,175	2,892	3,175
OR- 311-AB	Remedial Action and Fugitive Waste Managemen	4,750	0	4,750	0

ACTIVITY DATA SHEETS
SORTED BY FIELD OFFICE, INSTALLATION, AND CATEGORY
(dollars in thousands)

ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
OR- 312-	WAG Surveillance and Maintenance - EX	511	500	511	500
OR- 313-AA	SFMP Surveillance & Maintenance	432	1,268	432	1,116
OR- 313-AB	Molten Salt Reactor Experiment Compliance Up	0	0	0	0
OR- 313-AC	Isotope Facilities Surveillance and Maintena	0	0	0	0
OR- 314-	Defense D&D Surveillance & Maintenance	1,195	1,176	1,195	855
OR- 315-	Energy Research D&D Surveillance & Maintenan	340	0	340	0
OR- 317-	FUSRAP Radiological Surveys	600	800	600	800
OR- 318-	UMTRAP Radiological and Verification Surveys	154	100	154	100
OR- 319-	Integrated Data Base Program	105	110	105	110
OR- 320-	SFMP Verification and Designation Surveys at	70	250	70	226
OR- 322-	Site Investigation - EW	2,658	1,304	2,658	1,128
OR- 323-	Site Investigation - EX	14	1,650	14	1,826
OR- 324-AA	RNL RI/FS WAG 1 - EW	2,825	983	2,825	983
OR- 324-AB	ORNL RI/FS WAG 2	1,025	971	1,025	971
OR- 324-AC	ORNL RI/FS WAG 3	100	0	100	3,594
OR- 324-AD	ORNL RI/FS WAG 4	125	4,028	125	3,872
OR- 324-AE	ORNL RI/FS WAG 5	6,034	2,308	6,034	2,238
OR- 324-AF	ORNL RI/FS WAG 7	9,751	2,555	9,751	3,695
OR- 324-AG	ORNL RI/FS WAG 9	0	0	0	1,845
OR- 324-AH	ORNL RI/FS WAG 10	2,893	600	2,893	2,977
OR- 324-AJ	ORNL RI/FS WAG 11 - EW	0	0	0	20
OR- 324-AK	ORNL RI/FS WAG 13 - EW	0	0	0	20
OR- 324-AM	ORNL RI/FS WAG 17 - EW	0	0	0	0
OR- 324-XA	ORNL RI/FS WAG 1 - EW	0	7,000	0	0
OR- 324-XF	ORNL RI/FS WAG 7	0	1,220	0	0
OR- 324-XH	ORNL RI/FS WAG 10	0	2,542	0	0
OR- 325-AA	ORNL RI/FS WAG 1 - EX	2,430	1,095	2,430	1,046
OR- 325-AB	ORNL RI/FS WAG 8	0	0	0	0
OR- 325-AC	ORNL RI/FS WAG 11 - EX	0	0	0	0
OR- 325-AD	ORNL RI/FS WAG 13 - EX	0	0	0	0
OR- 325-AE	ORNL RI/FS WAG 17 - EX	0	0	0	0
OR- 328-	OHF Pond Stabilization	0	0	0	1,784
OR- 329-	ORNL Interim Corrective Measures-EW	7,388	2,469	7,388	8,795
OR- 329-EX	ORNL Interim Corrective Measures	0	0	0	3,015
OR- 330-	ORNL Interim Corrective Measures - EX	2,577	65	2,577	871
OR- 331-	Inactive LLLW Tank System	6,670	958	6,670	1,078
OR- 331-EX	Inactive LLLW Tank System	0	7,000	0	22,000
OR- 332-AA	General Site Closures	120	284	120	284
OR- 332-AB	WAG 6 Closure	19,921	838	19,921	2,620
OR- 332-EX	WAG 6 Closure	0	29,000	0	25,184
OR- 333-	Hydrofracture Closure	0	0	0	3,030
OR- 338-AB	Molten Salt Reactor Experiment Decommissioni	0	0	0	0
OR- 338-AC	Shielded Transfer Tanks Decommissioning	0	300	0	0
OR- 338-AD	ORR Experimental Facilities Decommissioning	0	0	0	0
OR- 339-AA	Metal Recovery Facility Decommissioning	0	0	0	0
OR- 339-AB	Fission Product Development Laboratory Decom	0	0	0	0
OR- 339-AC	Homogeneous Reactor Experiment Decomissionin	0	300	0	300
OR- 339-AD	Fission Product Pilot Plant Decommissioning	0	250	0	250
OR- 339-AE	Waste Evaporator Facility Decommissioning	0	0	0	0
OR- 339-AF	Old Hydrofracture Facility Decommissioning	0	0	0	0
OR- 339-AG	Low Intensity Test Reactor Decommissioning	0	0	0	0
OR- 363-	ORNL WAG 6 RFI/CMS	1,455	451	1,455	451
OR- 380-	SFMP General IVC Radiological Surveys	50	150	50	150
OR- 381-	GJPORAP Independent Verification	175	500	175	500
OR- 387-	Isotope Facilities Shutdown Program	0	0	0	0
OR- 387-AA	Isotopes Facility Shutdown Program	9,600	0	9,600	0
OR- 399-EW	Landlord Support - GPP/GPE	0	0	0	0
OR- 830-	CSX Site Characterization	96	200	96	200
OR- 831-	CSX Site Remediation	404	200	404	200
Subtotal OR, OAK RIDGE NATIONAL LABORATORY, ER		87,360	76,600	87,360	101,809

ACTIVITY DATA SHEETS
SORTED BY FIELD OFFICE, INSTALLATION, AND CATEGORY
(dollars in thousands)

ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
FIELD OFFICE: OR INSTALLATION: OAK RIDGE NATIONAL LABORATORY CATEGORY: LD					
OR- 399-	ORNL Landlord Support - EM	0	0	0	15,000
Subtotal OR, OAK RIDGE NATIONAL LABORATORY, LD		0	0	0	15,000
FIELD OFFICE: OR INSTALLATION: OAK RIDGE NATIONAL LABORATORY CATEGORY: WM					
OR- 342-	Waste Treatment - MW	6,575	10,121	6,575	10,900
OR- 343-	Waste Treatment	4,221	5,000	4,221	6,100
OR- 344-	Waste Storage-MW	2,600	420	2,600	2,620
OR- 347-	Waste Disposal	3,265	3,855	3,265	8,265
OR- 348-	Waste Disposal	2,900	4,200	2,900	4,200
OR- 349-	Continuity of Operations - MW	13,365	10,070	13,365	14,000
OR- 350-	Continuity of Operations - MW	9,559	11,057	9,559	14,542
OR- 352-	Waste Treatment-Solid-LIP WHPP and Support -	1,000	1,000	1,000	3,287
OR- 352-AA	Liquid Low-Level Storage Tanks	0	0	0	2,000
OR- 353-	Continuity - LIP Waste Chara. & Cert. Facili	0	0	0	350
OR- 355-	Waste Minimization - Liquid Waste - MW	250	250	250	1,600
OR- 356-	Waste Minimization - MW	675	1,350	675	1,700
OR- 366-	Waste Treatment-Water - PWTP	2,350	500	2,350	500
OR- 378-	Liquid-Active LLW Tank Compliance	7,275	10,924	7,275	19,232
OR- 378-AA	Liquid-Active LLW Tank Compliance - LIP	0	0	0	0
OR- 378-AB	Liquid-Active LLW Tank Compliance - LIP	0	0	0	0
OR- 386-	Sealed Source Storage Program	0	0	0	0
OR- 389-	Waste Storage - Solid - ORNL TRU Waste - MW	0	0	0	0
OR- 390-	TECHNICAL ADVISORY PANEL - DOE WASTE TANK IS	0	0	0	0
Subtotal OR, OAK RIDGE NATIONAL LABORATORY, WM		54,035	58,747	54,035	89,296
Subtotal OR, OAK RIDGE NATIONAL LABORATORY		148,674	151,747	148,674	222,505
FIELD OFFICE: OR INSTALLATION: OR ASSOC. UNIVERS. CATEGORY: CA					
OR- 924-	MINORITY STUDENTTS HAZ. MATERIALS MANG. TRAI	48	0	48	0
Subtotal OR, OR ASSOC. UNIVERS., CA		48	0	48	0
FIELD OFFICE: OR INSTALLATION: OR ASSOC. UNIVERS. CATEGORY: ER					
OR- 916-	SOUTH CAMPUS BUILDING CLEANUP	0	0	0	1,622
OR- 917-	Environmental Survey and Site Assessment-FUR	520	700	520	712
OR- 918-	Environmental Survey and Site Assesment-D&D	165	362	165	550
OR- 919-	Enviromental Survey and Site Assessment-WSSR	125	150	125	150
Subtotal OR, OR ASSOC. UNIVERS., ER		810	1,212	810	3,034
FIELD OFFICE: OR INSTALLATION: OR ASSOC. UNIVERS. CATEGORY: WM					
OR- 920-	WASTE MANAGEMENT FOR RESEARCH AND TRAINING P	34	0	34	0
Subtotal OR, OR ASSOC. UNIVERS., WM		34	0	34	0
Subtotal OR, OR ASSOC. UNIVERS.		892	1,212	892	3,034
FIELD OFFICE: OR INSTALLATION: ORO - DIRECT CATEGORY: ER					
OR- 800-AP	APOLLO	0	0	0	0
OR- 801-A	ORO Direct	13,255	2,711	13,255	29,547
OR- 825-	Agreement in Principle - TN grant	3,600	4,275	3,600	4,275
OR- 826-	Agreement in Principle: TN FFA Support	300	410	300	410
OR- 827-	Agreement in Principle: Kentucky Grant	1,300	1,300	1,300	1,300
OR- 828-	Agreement in Principle: Ohio grant	500	600	500	600
OR- 931-	ORAU Remedial Action	1,520	0	1,520	0
Subtotal OR, ORO - DIRECT, ER		20,475	9,296	20,475	36,132
FIELD OFFICE: OR INSTALLATION: ORO - DIRECT CATEGORY: WM					
OR- 802-	Technical Waste Management Program Support	3,215	4,800	3,215	4,800
OR- 805-	ORO-WM Program FTEs	0	0	0	0
Subtotal OR, ORO - DIRECT, WM		3,215	4,800	3,215	4,800
Subtotal OR, ORO - DIRECT		23,690	14,096	23,690	40,932

ACTIVITY DATA SHEETS
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(dollars in thousands)

ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
FIELD OFFICE: OR INSTALLATION: PADUCAH GASEOUS DIFFUSION PLANT CATEGORY: CA					
OR- 501-CD	Biological Monitoring	780	0	780	0
OR- 502-	KPDES Compliance (1995 LIP)	0	50	0	50
OR- 504-	Reduction of PCB Contamination (91-U-206) (1	9,369	13,700	9,369	13,700
OR- 526-	Classified Burial Ground Closure (1990 GPP)	0	350	0	350
OR- 533-	KPDES Compliance Projects (GPPs)	1,700	0	1,700	0
OR- 535-	PCB Wastewater Treatment System (FY 1992 GPP	810	0	810	0
OR- 538-	Control and Cleanup of PCB Effluents	0	125	0	125
OR- 539-	Removal of Asbestos in Scrap Metal Storage A	0	2,000	0	2,000
Subtotal OR, PADUCAH GASEOUS DIFFUSION PLANT, CA		12,659	16,225	12,659	16,225
FIELD OFFICE: OR INSTALLATION: PADUCAH GASEOUS DIFFUSION PLANT CATEGORY: ER					
OR- 510-CD	D&D Surveillance and Maintenance	0	0	0	0
OR- 510-EW	D&D Surveillance and Maintenance	895	900	895	900
OR- 540-EW	Federal Facilities Agreement - PADUCAH	0	1,320	0	1,340
OR- 550-CD	Project Management	1,616	1,800	1,616	1,800
OR- 550-EW	Project Management	1,616	1,800	1,616	1,800
OR- 551-CD	Site Investigation for Groundwater Contamina	1,463	1,265	1,463	1,265
OR- 551-EW	Site Investigation for Groundwater Contamina	1,462	1,265	1,462	1,265
OR- 552-CD	Groundwater Programs	800	700	800	700
OR- 552-EW	Groundwater Programs	500	700	500	700
OR- 553-	Underground Storage Tanks - Removal	0	0	0	0
OR- 554-CD	Support Facilities - Corrective Measures	1,250	2,060	1,250	2,060
OR- 554-EW	Support Facilities - Corrective Measures	850	2,060	850	2,060
OR- 555-CD	HSWA Groups II thru IX - Assessment	2,500	8,600	2,500	10,010
OR- 555-EW	HSWA Groups II thru IX - Assessment	1,797	8,600	1,797	10,010
OR- 556-CD	HWSA Groups I thru IX - Corrective Measures	6,995	8,900	6,995	10,310
OR- 556-EW	HSWA Groups I thru IX - Corrective Measures	6,880	8,900	6,880	10,310
OR- 557-EW	Agreement In Principle - PGDP ERP Support	0	175	0	475
Subtotal OR, PADUCAH GASEOUS DIFFUSION PLANT, ER		28,624	49,045	28,624	55,005
FIELD OFFICE: OR INSTALLATION: PADUCAH GASEOUS DIFFUSION PLANT CATEGORY: WM					
OR- 503-	Dike Upgrades	0	412	0	412
OR- 505-	Chlorinated Solvent Elimination (1993 LIP)	25	200	25	425
OR- 506-	1992 Wastewater Treat System	1,170	1,300	1,170	2,156
OR- 518-	Waste Management Operations/Continuity	10,448	19,026	10,448	19,754
OR- 519-	TSCA INCINERATOR	0	0	0	0
OR- 520-	WM Oper/Disposal - Low-Level Waste Disp Faci	50	0	50	0
OR- 521-	WM Oper/Storage - Storage Facility Upgrade	612	1,400	612	612
OR- 522-	Solid Waste Landfill	25	4,000	25	25
OR- 523-	WM Operations/Disposal - Scrap Metal Recover	1,613	1,613	1,613	1,613
OR- 524-	Mixed Waste Storage Facility	0	1,000	0	1,500
OR- 525-	Low Level Radiation Detection System	0	0	0	0
OR- 527-	Residential Landfill	0	0	0	0
OR- 528-	Scrap Metal Storage and Disposal	375	1,775	375	1,775
OR- 530-	Capital Equipment	0	400	0	400
OR- 532-	Mixed Waste Treatment System (FY 1994 LI)	200	500	200	500
OR- 560-CD	Mixed and PCB/Radioactive Waste Operations	2,625	8,750	2,625	8,750
OR- 561-CD	Low-Level Waste Operations	500	500	500	500
Subtotal OR, PADUCAH GASEOUS DIFFUSION PLANT, WM		17,643	40,876	17,643	38,422
Subtotal OR, PADUCAH GASEOUS DIFFUSION PLANT		58,926	106,146	58,926	109,652
FIELD OFFICE: OR INSTALLATION: PORTSMOUTH GASEOUS DIFFUSION PLANT CATEGORY: CA					
OR- 601-AA	Improvements to Meet Current NPDES Permit	1,275	2,056	1,275	2,056
OR- 602-AA	PB/PCB Control Improvements (Gaskets)	7,150	18,645	7,150	18,645
OR- 627-AA	PB/PCB Lube Oil Replacement	0	0	0	0
Subtotal OR, PORTSMOUTH GASEOUS DIFFUSION PLANT, CA		8,425	20,701	8,425	20,701
FIELD OFFICE: OR INSTALLATION: PORTSMOUTH GASEOUS DIFFUSION PLANT CATEGORY: ER					
OR- 610-CD	UST's/AST's	380	595	380	595
OR- 610-EW	UST's/AST's	380	595	380	595
OR- 611-CD	Quadrant I thru IV - Remediation	1,900	4,238	1,900	4,805

ACTIVITY DATA SHEETS
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(dollars in thousands)

ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
OR- 611-EW	Quadrant I thru IV - Remediation	0	3,007	0	4,805
OR- 613-CD	Closures	0	250	0	250
OR- 613-EW	Closures	0	250	0	250
OR- 615-CD	GCEP TERMINATION	0	0	0	0
OR- 615-EW	GCEP TERMINATION	4,272	1,280	4,272	1,280
OR- 625-CD	GCEP Termination (Surveillance and Maintenan	0	0	0	0
OR- 625-EW	GCEP Termination (Surveillance and Maintenan	2,138	2,360	2,138	2,360
OR- 628-EW	Demolition of Abandoned Facilities	558	1,200	558	1,200
OR- 636-CD	Quadrant I thru IV - Assessment	5,924	5,293	5,924	8,744
OR- 636-EW	Quadrant I thru IV - Assessment	7,260	5,293	7,260	8,744
OR- 637-CD	Ground Water Protection Program	869	1,015	869	1,015
OR- 637-EW	Ground Water Protection Program	392	1,015	392	1,015
Subtotal OR, PORTSMOUTH GASEOUS DIFFUSION PLANT, ER		24,073	26,391	24,073	35,658
FIELD OFFICE: OR INSTALLATION: PORTSMOUTH GASEOUS DIFFUSION PLANT CATEGORY: WM					
OR- 616-AA	Treatment (Continuity of Operations)	2,760	2,445	2,760	2,645
OR- 617-AA	TREATMENT-RCRA/TSCA/MIXED INCIN. - SHIPPING	170	170	170	170
OR- 618-AA	Storage/Waste Storage Facility	0	175	0	325
OR- 619-AA	LLW Disposal Facility	0	0	0	0
OR- 620-AA	Mixed Waste Storage	0	100	0	100
OR- 622-AA	Treatment Mixed Waste - U Solution Recovery/	1,660	300	1,660	300
OR- 624-AA	Disposal-LL Scrap Metal Recovery	0	225	0	50
OR- 630-AA	Treatment/Continuity of Operations/Managemen	11,321	13,355	11,321	13,355
OR- 632-AA	STORAGE - RADIOACTIVE SCRAP METAL	150	200	150	200
OR- 633-AA	Continuity of Operations (NPDES, L.I.)	0	0	0	0
OR- 660-CD	Non-Radioactive RCRA, TSCA Waste Operations	18,500	5,400	18,500	5,400
OR- 661-CD	LLW, Mixed RCRA, and Mixed TSCA Waste Operat	0	0	0	0
Subtotal OR, PORTSMOUTH GASEOUS DIFFUSION PLANT, WM		34,561	22,370	34,561	22,545
Subtotal OR, PORTSMOUTH GASEOUS DIFFUSION PLANT		67,059	69,462	67,059	78,904
FIELD OFFICE: OR INSTALLATION: SFMP NIAGARA FALLS STORAGE SITER CATEGORY: ER					
OR- 109-AA	Cleanup	0	0	0	0
Subtotal OR, SFMP NIAGARA FALLS STORAGE SITER, ER		0	0	0	0
Subtotal OR, SFMP NIAGARA FALLS STORAGE SITER		0	0	0	0
FIELD OFFICE: OR INSTALLATION: WELDON SPRING SITE REMEDIAL ACTIONS CATEGORY: ER					
OR- 704-	Environmental Compliance For WSSRAP	698	3,287	698	3,287
OR- 705-	REMEDIATE WELDON SPRING SITE/QUARRY	48,302	47,676	48,302	47,676
Subtotal OR, WELDON SPRING SITE REMEDIAL ACTIONS, ER		49,000	50,963	49,000	50,963
Subtotal OR, WELDON SPRING SITE REMEDIAL ACTIONS		49,000	50,963	49,000	50,963
FIELD OFFICE: OR INSTALLATION: Y-12 CATEGORY: CA					
OR- 204-	Steam Plant Ash Disposal Facility	8,122	0	8,122	0
OR- 244-C1	Nonpermitted Plant Drains	1,150	0	1,150	0
OR- 244-CA	Nonpermitted Plant Drains	585	430	585	430
OR- 245-CA	Treatment Plant Discharges	3,190	0	3,190	0
OR- 246-CA	Cooling Water Discharges	500	0	500	0
OR- 247-CA	Non-Point Source Pollution Control	630	0	630	0
OR- 250-CA	Cooling Towers	830	600	830	600
OR- 260-CA	Sanitary Sewer System Rehabilitation	420	0	420	0
OR- 261-CA	Sanitary Sewer System Rehabilitation	350	0	350	0
Subtotal OR, Y-12, CA		15,777	1,030	15,777	1,030
FIELD OFFICE: OR INSTALLATION: Y-12 CATEGORY: ER					
OR- 209-G1	EFPC Activities Assessment	300	1,148	300	1,350
OR- 209-G2	EFPC Activities - Remediation	3,000	1,870	3,000	2,200
OR- 211-G1	RCRA Closures Phase I (CAPCA Project)	0	0	0	0
OR- 222-G1	Decontamination & Decommissioning	0	3,000	0	3,000
OR- 243-G1	RCRA Phase II Postclosure Activities - CAPCA	2,800	552	2,800	850
OR- 243-G2	RCRA Phase II Post Closure Activities - CAPC	6,300	12,733	6,300	24,000

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ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
OR- 252-G1	Decontamination & Decommissioning - 9731	0	0	0	1,000
OR- 253-G1	Decontamination & Decommissioning - 9202	0	0	0	2,000
OR- 254-G1	Surveillance & Maintenance, Building 9201-4	446	750	446	750
OR- 255-	Surveillance & Maintenance, Bldg. 9201-2, 97	0	1,250	0	1,250
OR- 277-	Chestnut Ridge Assessment	1,207	0	1,207	793
OR- 278-	Chestnut Ridge - Remediation	0	105	0	2,100
OR- 279-	Upper East Fork Poplar Creek Watershed Asses	3,247	2,757	3,247	4,242
OR- 280-	Upper East Fork Poplar Creek - Remediation	6,303	7,150	6,303	11,000
OR- 281-	Bear Creek Valley Assessments	3,411	535	3,411	1,783
OR- 282-	Bear Creek Drainage Basin - Remediation	0	750	0	2,500
Subtotal OR, Y-12, ER		27,014	32,600	27,014	58,818
FIELD OFFICE: OR INSTALLATION: Y-12 CATEGORY: WM					
OR- 208-	Environmental Surveillance Upgrades	505	0	505	0
OR- 223-AA	TREATMENT (MW)	15,946	16,720	15,946	17,085
OR- 223-AB	TREATMENT-PRIVATIZATION (MW)	290	265	290	265
OR- 224-	STORAGE (MW)	14,048	9,660	14,048	9,660
OR- 225-	DISPOSAL(MW)	10,130	11,740	10,130	11,740
OR- 226-	CONTINUITY OF OPERATIONS (MW)	17,540	13,900	17,540	13,900
OR- 228-	PRODUCTION WASTE STORAGE FACILITY(PWSF)(MW)	9,238	0	9,238	0
OR- 228-A	PRODUCTION WASTE STORAGE FACILITY(PWSF)(MW)	0	4,200	0	4,200
OR- 229-	WASTE MINIMIZATION(MW)	405	525	405	525
OR- 232-	PRODUCTION WASTE TREATMENT FACILITIES(MW)	1,470	4,580	1,470	4,580
OR- 234-	PRODUCTION WASTE TREATMENT FACILITIES, PHASE	1,960	300	1,960	3,540
OR- 244-WM	Nonpermitted Plant Drains	0	0	0	2,250
OR- 245-WM	Treatment Plant Discharges	0	805	0	805
OR- 246-WM	Cooling Water Discharges	0	960	0	960
OR- 247-WM	Non-Point Source Pollution Control	0	225	0	225
OR- 248-	DEPLETED URANIUM OXIDATION FACILITY	400	800	400	800
OR- 260-WM	Sanitary Sewer System Rehabilitation	0	240	0	240
Subtotal OR, Y-12, WM		71,932	64,920	71,932	70,775
Subtotal OR, Y-12		114,723	98,550	114,723	130,623
Subtotal OR		720,675	817,514	720,675	1,156,707
FIELD OFFICE: RF INSTALLATION: CATEGORY: WM					
RF-3000-	WASTE PROCESSING FACILITY - INSIDE PSZ	0	1,000	0	2,000
RF-3001-	WASTE PROCESSING FACILITY - OUTSIDE PSZ	0	0	0	0
RF-3408-	BALER UPGRADE, BUILDING 889	100	1,000	100	1,000
Subtotal RF, , WM		100	2,000	100	3,000
Subtotal RF,		100	2,000	100	3,000
FIELD OFFICE: RF INSTALLATION: ROCKY FLATS PLANT CATEGORY: CA					
RF- 79-A	POND SEDIMENT CONTROL	565	0	565	0
RF- 82-	VOC MONITORING	0	0	0	0
RF- 83-	UPGRADE RADIOACTIVE STACK SAMPLING	466	0	466	0
RF- 108-A	PREPARE AIR POLLUTION EMISSION NOTICES (APEN	0	0	0	0
RF- 109-	SURVEY AND IDENTIFY EXISTING NESHAPS EMISSIO	1,220	0	1,220	0
Subtotal RF, ROCKY FLATS PLANT, CA		2,251	0	2,251	0
FIELD OFFICE: RF INSTALLATION: ROCKY FLATS PLANT CATEGORY: ER					
RF-1001-A	OPERABLE UNIT 1 (881 HILLSIDE) ASSESSMENT	2,636	1,013	2,636	1,039
RF-1001-B	OPERABLE UNIT 1 (881 HILLSIDE) REMEDIATION	2,025	1,224	2,025	1,155
RF-1002-A	OPERABLE UNIT 2 903 PAD, MOUND, & EAST TRENC	6,600	2,072	6,600	2,485
RF-1002-B	OPERABLE UNIT 2 (903 PAD, MOUND & EAST TRENC	2,010	1,383	2,010	1,465
RF-1005-A	OPERABLE UNIT 5 WOMAN CREEK ASSESSMENT	3,498	4,207	3,498	3,739
RF-1005-B	OPERABLE UNIT 5 WOMAN CREEK REMEDIATION	0	0	0	0
RF-1006-A	OPERABLE UNIT 8 (700 AREA) ASSESSMENT	0	0	0	8,745
RF-1006-B	OPERABLE UNIT 8 (700 AREA) REMEDIATION	0	0	0	0
RF-1007-A	OPERABLE UNIT 12 (400/800 AREA) ASSESSMENT	0	0	0	3,354
RF-1007-B	OPERABLE UNIT 12 (400/800 AREA) REMEDIATION	0	0	0	0

APPENDIX F (Continued)

ACTIVITY DATA SHEETS
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ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
RF-1008-A	OPERABLE UNIT 13 (100 AREA) ASSESSMENT	0	0	0	4,137
RF-1008-B	OPERABLE UNIT 13 (100 AREA) REMEDIATION	0	0	0	0
RF-1009-	OPERABLE UNIT 16 (LOW PRIORITY SITES) ASSESS	0	0	0	0
RF-1010-A	OPERABLE UNIT 14 (RADIOACTIVE SITES) ASSESSM	0	0	0	2,402
RF-1010-B	OPERABLE UNIT 14 (RADIOACTIVE SITES) REMEDIA	0	0	0	0
RF-1011-	OPERABLE UNIT 3 (OFFSITE AREAS) ASSESSMENT	801	601	801	657
RF-1012-	SITEWIDE PROGRAMS ASSESSMENT	14,197	7,562	14,197	15,557
RF-1014-A	OPERABLE UNIT 6 (WALNUT CREEK) ASSESSMENT	6,578	7,737	6,578	2,527
RF-1014-B	OPERABLE UNIT 6 (WALNUT CREEK) REMEDIATION	0	0	0	0
RF-1018-A	OPERABLE UNIT 15 INSIDE BUILDING CLOSURES AS	0	0	0	788
RF-1018-B	OPERABLE UNIT 15 INSIDE BUILDING CLOSURES RE	0	0	0	0
RF-1231-A	OPERABLE UNIT 10 (OTHER OUTSIDE CLOSURES) AS	0	0	0	6,122
RF-1231-B	OPERABLE UNIT 10 (OTHER OUTSIDE CLOSURES) RE	0	0	0	10
RF-1233-	ER PROGRAM MANAGEMENT	6,989	7,576	6,989	7,576
RF-1251-A	OPERABLE UNIT 9 (OPWL) ASSESSMENT	0	0	0	3,923
RF-1251-B	OPERABLE UNIT 9 (OPWL) REMEDIATION	0	0	0	0
RF-1255-A	OPERABLE UNIT 7 (PRESENT LANDFILL) ASSESSMEN	0	0	0	3,013
RF-1255-B	OPERABLE UNIT 7 (PRESENT LANDFILL) REMEDIATI	0	0	0	26
RF-1258-A	OPERABLE UNIT 4 (SOLAR PONDS) ASSESSMENT	3,686	2,025	3,686	2,025
RF-1258-B	OPERABLE UNIT 4 (SOLAR PONDS) REMEDIATION	0	0	0	29,592
RF-1261-A	OPERABLE UNIT 11 (WEST SPRAY FIELD) ASSESSME	0	0	0	1,449
RF-1261-B	OPERABLE UNIT 11 (WEST SPRAY FIELD) REMEDIAT	0	0	0	10
RF-1263-A	OXNARD FACILITY ASSESSMENT	980	600	980	1,316
RF-1263-B	OXNARD FACILITY REMEDIATION	0	0	0	0
RF-1264-	OFFSITE WATER MANAGEMENT (OPTION B)	0	17,000	0	40,000
RF-1265-	ONSITE WATER MANAGEMENT (OPTION J)	0	2,000	0	12,000
Subtotal RF, ROCKY FLATS PLANT, ER		50,000	55,000	50,000	155,112
FIELD OFFICE: RF INSTALLATION: ROCKY FLATS PLANT CATEGORY: WM					
RF- 81-	COMPLIANCE PROGRAM MANAGEMENT	3,887	7,396	3,887	8,600
RF- 90-	WASTE & ENVIRONMENTAL DATA MANAGEMENT	2,032	1,475	2,032	1,715
RF- 108-B	PREPARE AIR POLLUTION EMISSION NOTICES (APEN	0	0	0	0
RF- 110-	AUGMENT SAMPLING AND ANALYSIS OF SURFACE WAT	0	0	0	0
RF-3134-	ADVANCED SIZE REDUCTION FACILITY (ASRF) ASSA	0	0	0	700
RF-3135-	BUILDING 374 LIQUID WASTE TREATMENT FACILITY	588	3,640	588	,640
RF-3136-	BUILDING 569 ADDITION	0	0	0	0
RF-3137-	BUILDING 776 UPGRADE, PHASE I	100	0	100	704
RF-3139-	CRATE AND DRUM COUNTING AREA IN BUILDING 776	0	0	0	0
RF-3146-	IMPROVE ADVANCED SIZE REDUCTION FACILITY, BL	0	0	0	700
RF-3148-	LIQUID WASTE OPERATIONS, BUILDING 374	8,015	7,265	8,015	8,448
RF-3149-	LIQUID WASTE OPERATIONS, BUILDING 774	6,957	7,625	6,957	9,682
RF-3150-	LLW-MIXED STORAGE FACILITY	930	170	930	170
RF-3151-	LOW-LEVEL WASTE SIZE REDUCTION	0	0	0	0
RF-3153-	NEW SANITARY LANDFILL	1,244	4,002	1,244	4,002
RF-3156-	NITRATE SALT IMMOBILIZATION SYSTEM, BUILDING	0	0	0	0
RF-3157-	OFFSITE TRANSPORTATION/DISPOSAL OF WASTE	788	5,300	788	5,300
RF-3158-	ORGANIC PROCESS SYSTEM, BUILDING 774	0	0	0	0
RF-3160-	PROCESS WASTE TRANSFER SYSTEM	0	2,895	0	2,895
RF-3161-	REAL-TIME RADIOGRAPHY	0	0	0	0
RF-3162-	REPLACE BUILDING 668	0	0	0	0
RF-3164-	SALTCRETE DISPOSAL	0	2,604	0	2,604
RF-3166-	SLUDGE IMMOBILIZATION SYSTEM, BUILDING 774	0	0	0	3,662
RF-3167-	SLUDGE IMMOBILIZATION SYSTEM, BUILDING 374	0	172	0	200
RF-3168-	SOLID WASTE OPERATIONS, NON-PSZ	15,534	13,392	15,534	15,386
RF-3169-	SOLID WASTE OPERATIONS, PSZ	8,869	2,810	8,869	3,139
RF-3171-	SUPERCOMPACTOR & REPACKAGING FAC-AUTOMATION	0	0	0	990
RF-3174-	WASTE EVAPORATOR RENOVATION, BUILDING 374	0	0	0	100
RF-3177-	WASTE MANAGEMENT PROGRAM SUPPORT	25,706	23,743	25,706	27,510
RF-3242-	WASTE MINIMIZATION, PROGRAM ADMINISTRATION	1,406	1,522	1,406	1,722
RF-3260-	WASTE CERTIFICATION	2,480	2,400	2,480	2,580
RF-3286-	WASTE CEMENTATION UPGRADES	0	0	0	0
RF-3287-	COMPREHENSIVE WASTEWATER MANAGEMENT PLAN	0	0	0	0
RF-3288-	SEWAGE TREATMENT PLANT UPGRADE	7,419	200	7,419	200

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ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
RF-3290-	IMPLEMENT COMPREHENSIVE WASTEWATER MANAGEMEN	0	0	0	0
RF-3291-	CAN & DRUM COUNTER CONTROL & DATA ACQUISITIO	0	0	0	160
RF-3293-	PROGRAM SUPPORT FOR COMPLIANCE ACTIVITIES	3,986	2,297	3,986	2,297
RF-3294-A	PAYMENT TO THE STATE OF COLORADO AND LOCAL C	0	2,340	0	2,340
RF-3294-C	OFFSITE WATER MANAGEMENT (OPTION B)	5,000	0	5,000	0
RF-3298-	STEAM CLEANING/STRIPPING	0	0	0	0
RF-3400-	SLUDGE IMMOBILIZATION SYSTEM, BUILDING 776	0	0	0	0
RF-3401-A	THERMAL TREATMENT PROCESS UNIT	0	860	0	1,000
RF-3402-	WIPP BIN/ALCOVE SUPPORT	0	0	0	0
RF-3409-	RCRA WASTE CHARACTERIZATION AND CLOSURE	0	0	0	10,500
RF-4118-A	POLYMER SOLIDIFICATION	0	0	0	0
Subtotal RF, ROCKY FLATS PLANT, WM		94,941	92,108	94,941	120,946
Subtotal RF, ROCKY FLATS PLANT		147,192	147,108	147,192	276,058
Subtotal RF		147,292	149,108	147,292	279,058
FIELD OFFICE: RL INSTALLATION: CATEGORY: ER					
RL-5175-EF	SINGLE-SHELL TANK WASTE CHARACTERIZATION & A	2,496	8,292	2,496	27,536
Subtotal RL, , ER		2,496	8,292	2,496	27,536
FIELD OFFICE: RL INSTALLATION: CATEGORY: WM					
RL-9063-4J	ENVIR. MON. WELL SAMPLING & ANALYSIS	9,414	11,594	9,414	11,594
RL-9097-1T	LIQUID EFFLUENT RETENTION FACILITY (LERF)	0	0	0	0
RL-9402-1Y	EFFLUENT TECHNOLOGY STUDIES	125	125	125	2,046
RL-9878-1Y	HANFORD SITE PHASE II EFF TREATMENT AND DISP	0	0	0	1,156
Subtotal RL, , WM		9,539	11,719	9,539	14,796
Subtotal RL,		12,035	20,011	12,035	42,332
FIELD OFFICE: RL INSTALLATION: HANFORD CATEGORY: CA					
RL-2001-AR	NUCLEAR ENERGY RCRA PERMITS/CLOSURE	0	0	0	0
RL-9062-4J	ENVIR MONITORING - RCRA GW MON WELL INSTALLA	5,527	0	5,527	0
RL-9092-4A	AIR PERMITTING/COMPLIANCE (FEMPS)	1,640	0	1,640	0
RL-9112-1B	DST PERMITTING (TPA) (W1B)	0	0	0	0
RL-9119-1B	DST INTERIM STATUS COMPLIANCE (TPA)(W1B)	1,360	1,950	1,360	1,950
RL-9307-3B	SST INTERIM STATUS COMPLIANCE (TPA) (W3B)	315	455	315	455
Subtotal RL, HANFORD, CA		8,842	2,405	8,842	2,405
FIELD OFFICE: RL INSTALLATION: HANFORD CATEGORY: ER					
RL- 101-RL	PROGRAM DIRECTION - ENVIRONMENTAL RESTORATIO	0	0	0	0
RL-5000-E2	ERRA PROGRAM MANAGEMENT	5,012	6,577	5,012	6,577
RL-5002-E2	DOE-RL SUPPORT TO THE ERRA PROGRAM	3,170	3,950	3,170	4,353
RL-5004-E2	STATE OVERSITE	2,500	2,648	2,500	2,648
RL-5008-E2	ERRA PUBLIC AND MEDIA RELATIONS	380	621	380	621
RL-5009-E2	ERRA MANAGEMENT SYSTEMS	3,901	5,489	3,901	5,489
RL-5016-E2	QA PROGRAM DEVELOPMENT	968	1,620	968	1,620
RL-5017-E2	QA AUDIT AND SURVEILLANCE	0	523	0	523
RL-5022-E2	NEZ PERCE INDIAN NATION REVIEW	20	0	20	0
RL-5023-E2	YAKIMA INDIAN NATION REVIEW	194	0	194	0
RL-5024-E2	UMATILLA INDIAN NATION REVIEW	70	0	70	0
RL-5176-EF	SINGLE-SHELL TANK (SST) WASTE CHARACTERIZATI	11,504	13,708	11,504	19,446
RL-5178-EF	SINGLE-SHELL TANK ER-TD INTEGRATION	0	0	0	5,408
RL-5179-EF	SINGLE-SHELL TANK ER TECHNICAL SUPPORT	0	0	0	7,345
RL-5202-EG	TECHNICAL SUPPORT TO REMEDIAL ACTION	0	1,450	0	3,178
RL-5204-EG	GENERAL NEPA SUPPORT	1,385	2,070	1,385	2,793
RL-5225-EJ	RAD AREA REMEDIAL ACTION DECON/STABILIZATION	1,198	1,263	1,198	3,833
RL-5226-EJ	RADIATION AREA REMEDIAL ACTION SURVEILLANCE	4,302	4,306	4,302	4,396
RL-5228-EJ	INACTIVE UNDERGROUND STORAGE TANKS	500	431	500	431
RL-5230-EJ	SITE ASBESTOS ABATEMENT	0	0	0	2,696
RL-5250-EK	DRILLING UPGRADES	7,346	6,831	7,346	6,860
RL-5251-EK	LABORATORY UPGRADES	10,554	14,108	10,554	14,108

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ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
RL-5399-E	EXPEDITED RESPONSE ACTIONS	0	9,630	0	22,630
RL-6100-U1	HANFORD SITE D&D MANAGEMENT/ADMINISTRATION	1,900	1,926	1,900	1,926
RL-6150-U3	100/200/300 AREAS SURVEILLANCE AND MAINTENAN	6,000	6,741	6,000	6,741
RL-6351-UV	100/200/300 AREAS SITE CLEANUP OF EXCESS SUP	0	0	0	0
RL-8214-PE	HANFORD INTEGRATED PLANNING (HIP)	0	3,371	0	3,371
RL-8220-PE	DOE-HQ ER PLANNING & TECHNICAL SUPPORT	0	0	0	0
Subtotal RL, HANFORD, ER		60,904	87,263	60,904	126,993
FIELD OFFICE: RL INSTALLATION: HANFORD CATEGORY: LD					
RL-1002-F1	UNDERGROUND STORAGE TANK UPGRADES (LANDLORD)	355	3,786	355	4,145
RL-1003-F1	INFRASTRUCTURE SUPPORT-CONTINUITY OF OPERATI	67	0	67	0
RL-1004-F1	INFRASTRUCTURE SUPPORT-CONTINUITY OF OPERATI	3,368	123	3,368	841
RL-1005-F1	CONTINUITY OF OPERATIONS CORE ACTIVITIES	15,877	19,644	15,877	20,991
RL-1006-F1	LANDLORD PROGRAM SAFETY COMPLIANCE - PHASE I	9,010	4,813	9,010	4,813
RL-1008-F1	ROAD, GROUND AND LIGHTING SAFETY IMPROVEMENT	855	6,586	855	6,586
RL-1009-F1	HANFORD ENVIRONMENTAL DOSE RECONSTRUCTION PR	3,500	0	3,500	0
RL-1010-F1	DEMOLITION OF INFRASTRUCTURE FACILITIES	2,100	2,000	2,100	2,000
RL-1019-F1	COMPUTER AIDED DESIGN (CAD)/ENGINEERING EQUI	0	0	0	0
RL-1020-F1	HANFORD SCIENTIFIC ENGINEERING SYSTEM (HSES)	0	0	0	0
RL-1021-F1	LANDLORD PROGRAM SAFETY COMPLIANCE-PHASE II	69	0	69	1,557
RL-1022-F1	SOUTH OPERATIONS SUPPORT FACILITY	69	0	69	360
RL-1025-F1	ASBESTOS ABATEMENT PROGRAM	0	500	0	1,500
RL-1026-F1	INFRASTRUCTURE REPAIR AND REPLACEMENT	0	531	0	1,750
RL-1027-F1	SURVEILLANCE & MAINTENANCE OF NONRADIATION E	0	0	0	550
RL-1028-F1	NEPA COMPLIANCE	0	1,520	0	200
RL-1029-F1	GLOVE BOX REPLACEMENT	0	0	0	22
RL-1030-F1	NEC COMPLIANCE IN 300 AREA FOR HANFORD SUPPO	0	0	0	532
RL-1031-F1	HANFORD SCIENTIFIC & ENGINEERING SYSTEM REPL	0	0	0	0
RL-1032-F1	300 AREA PROCESS SEWER PIPING SYSTEM UPGRADE	343	72	343	72
RL-1033-F1	ENGINEERING AND CONSTRUCTION SUPP.FAC. 200E	0	0	0	0
RL-1034-F1	RAILROAD MAINTENANCE FACILITY	343	72	343	0
RL-1035-F1	SOUTH OFFICE FACILITY	57	72	57	240
RL-1036-F1	CENTRALIZED MAINTENANCE FACILITY	343	72	343	72
RL-1037-F1	CORE OUTYEAR GENERAL PLANT PROJECTS	534	5,463	534	5,650
RL-1038-F1	OUTYEAR GENERAL PLANT PROJECTS	890	3,349	890	2,828
RL-1039-F1	OUTYEAR GENERAL PLANT PROJECTS	0	0	0	0
RL-1040-F1	BUILDING UTILITIES REPLACEMENT, 300 AREA	0	0	0	0
RL-1043-F1	LIGHT/HEAVY DUTY VEHICLES AND HEAVY EQUIPMEN	0	0	0	0
Subtotal RL, HANFORD, LD		37,780	48,603	37,780	54,709
FIELD OFFICE: RL INSTALLATION: HANFORD CATEGORY: WM					
RL-1-HQ	DECONTAMINATE LAUNDRY FACILITY	0	0	0	0
RL-2-HQ	B Plant Safety Vent Upgr	4,400	0	4,400	0
RL-1006-HQ	LANDLORD PROGRAM SAFETY COMPLIANCE - PHASE I	0	0	0	0
RL-2000-AR	NUCLEAR ENERGY ENVIRONMENTAL COORDINATION	0	0	0	2,571
RL-2002-AR	NUCLEAR ENERGY WASTE MINIMIZATION	0	0	0	970
RL-2005-AR	NUCLEAR ENERGY WASTE ASSESSMENT	599	330	599	389
RL-2100-AR	FFTF OPERATION	0	0	0	0
RL-4000-0V	HANFORD WASTE VITRIFICATION PLANT TREATMENT	61,289	66,725	61,289	223,928
RL-8000-PW	ENVIRONMENTAL MONITORING/SURVEILLANCE (PNL)	10,860	4,841	10,860	10,583
RL-8002-PW	WASTE MANAGEMENT OPERATIONS (PNL) (CONT OF O	2,375	3,124	2,375	3,124
RL-8008-PW	MATERIALS CHARACTERIZATION CENTER DEFENSE WA	0	0	0	0
RL-8014-PW	LLW SORTING/SCANNING TABLE (PNL)	0	0	0	0
RL-8180-PW	HANFORD PERSONNEL DOSIMETRY UPGRADE	1,786	0	1,786	201
RL-8198-PW	HANFORD SCIENCE AND TECHNOLOGY PROGRAM	0	0	0	2,889
RL-8218-PW	WASTE MANAGEMENT OPERATIONS (PNL) (CONTINUIT	0	0	0	0
RL-8219-PW	HANFORD INTEGRATED PLANNING (HIP)	0	0	0	3,371
RL-9010-HX	PROJECTS TECHNICAL SUPPORT FOR DOE-HQ/EM-34	2,300	0	2,300	2,326
RL-9035-4H	WASTE MINIMIZATION (W4H5)	0	863	0	863
RL-9036-4H	YAKIMA INDIAN NATION REVIEW	0	1,166	0	1,166
RL-9037-4H	NEZ PERCE INDIAN NATION REVIEW	0	212	0	212
RL-9038-4H	UMATILLA INDIAN NATION REVIEW	0	567	0	567

ACTIVITY DATA SHEETS
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ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
RL-9050-4H	ENVIRONMENTAL PLANNING & REPORTING (W4H)	4,969	5,483	4,969	5,872
RL-9055-4H	TRI-PARTY AGREEMENT MANAGEMENT (W4H)	999	1,007	999	1,007
RL-9059-4H	TRI-PARTY AGREEMENT STATE FUNDING (W4H)	2,433	3,091	2,433	3,727
RL-9060-4J	ENV. MONITORING GROUNDWATER PROTECTION MANAG	0	0	0	0
RL-9061-4J	ENVIRONMENTAL MONITORING - PROGRAM MGMT & GW	1,389	1,467	1,389	1,600
RL-9064-4J	ENVIR MONITORING - GW MON WELL MAINTENANCE &	705	743	705	2,570
RL-9065-4J	ENVIR MONITORING - RCRA GW MON WELL INSTALLA	0	0	0	10,250
RL-9067-4J	ENVIR MONITORING - PURGEWATER DISPOSAL	792	614	792	614
RL-9090-WM	HANFORD FILTER TEST FACILITY - HFTF	289	268	289	268
RL-9091-4A	AIR PERMITTING/COMPLIANCE (FEMP IMPLEMENTATI	0	1,320	0	2,020
RL-9094-1Y	LIQUID EFFLUENT TREATMENT HEC LINE ITEM SUPP	5,997	6,205	5,997	9,000
RL-9098-6M	PLANNING AND INTEGRATION	5,511	6,200	5,511	14,636
RL-9100-1B	JOB CONTROL SYSTEM UPGRADES (W1B/W3B)	1,243	950	1,243	2,028
RL-9106-1B	TANK FARMS PROGRAM SUPPORT (W1B/W3B)	12,355	11,662	12,355	12,511
RL-9108-1B	TANK FARMS STORAGE OPERATIONS (W1B)	42,553	52,998	42,553	61,678
RL-9109-1B	DST TREATMENT OPERATIONS (W1B)	7,907	8,350	7,907	12,039
RL-9110-1B	244-AR VAULT---INACTIVE STATUS (W1B)	477	500	477	705
RL-9122-1B	DST PERMITTING (NOD)(TPA) (W1B)	484	0	484	0
RL-9123-1W	WASTE TANK HYDROGEN STABILIZATION (W1W)	11,000	32,260	11,000	32,260
RL-9305-3B	SST TREATMENT OPERATIONS (TPA)(W3B)	13,376	13,935	13,376	16,177
RL-9400-4A	ENVIR SURV & CONTROL-GENERAL PROGRAM SUPPORT	2,370	2,405	2,370	2,405
RL-9403-4A	ENVIR SURV & CONTROL-SURVEILLANCE AND MAINTE	6,417	7,430	6,417	7,430
RL-9404-4A	ENVIR SURV & CONTROL - 2727-S CLOSURE	150	0	150	0
RL-9406-1Y	EFFLUENT TREATMENT FACILITY OPERATIONS	600	2,070	600	2,985
RL-9489-XX	LEASE OF HANFORD SCIENTIFIC AND ENGINEERING	0	0	0	0
RL-9691-6S	INVENTORY ADMINISTRATION	1,700	1,700	1,700	1,902
RL-9692-6S	INVENTORY CHANGE	0	0	0	303
RL-9693-WM	STATE ENVIRONMENTAL OVERSIGHT & EMERGENCY PR	550	1,059	550	1,059
RL-9803-1R	TANK FARM MAJOR MAINTENANCE UPGRADES	2,310	4,000	2,310	8,578
RL-9804-1R	DESIGN FIELD VERIFICATION AND CONFIGURATION	5,990	4,849	5,990	4,849
RL-9805-1R	TANK FARM GENERAL PLANT PROJECT UPGRADES	6,450	1,260	6,450	3,854
RL-9806-1R	LINE ITEM HANFORD PROJECT UPGRADES	0	3,132	0	16,383
RL-9807-1R	TANK 106-C HIGH-HEAT WASTE REMOVAL	545	5,393	545	5,393
RL-9808-1R	TANK SAFETY INTERIM TREATMENT DEVELOPMENT (W	0	0	0	0
RL-9809-1R	CONTAMINATION ZONE REDUCTION	3,155	2,042	3,155	2,042
RL-9810-1R	TANK FARM VENTILATION UPGRADES	4,981	7,674	4,981	7,674
RL-9811-1R	NEW DST TANK FARM (95 LI)	280	1,156	280	1,156
RL-9812-1R	NEW DST TANK FARM (93 LI)	1,200	10,666	1,200	10,666
RL-9825-1E	242-A EVAPORATOR CONFINEMENT UPGRADES (W-085	2,500	406	2,500	406
L-9826-1E	242-A EVAPORATOR FACILITY CLEAN OUT BOX REMO	0	0	0	0
RL-9827-1E	242-A EVAPORATOR FACILITY ADDITIONAL UPGRADE	0	0	0	385
RL-9828-1E	242-A Evaporator Facility Restart	0	0	0	0
RL-9850-1W	WASTE TANK FERROCYANIDE STABILIZATION (W1W)	6,000	17,000	6,000	17,000
RL-9851-1W	OTHER WASTE TANK SAFETY ISSUES (W1W)	0	0	0	1,752
RL-9852-1W	WASTE TANK ORGANICS STABILIZATION (W1W)	1,000	8,778	1,000	8,778
RL-9853-1W	TANK SAFETY, STRUCTURAL AND CONTENTS DOCUMEN	2,400	8,850	2,400	12,080
RL-9854-1W	TANK SAFETY EIS SUPPORT (W1W)	0	750	0	2,648
RL-9855-1W	TANK SAFETY EIS (W1W)	0	0	0	0
RL-9900-WM	HANFORD ENVIRONMENTAL COMPLIANCE (HEC) PROJE	30,465	37,032	30,465	47,039
Subtotal RL, HANFORD, WM		275,151	352,533	275,151	608,889
Subtotal RL, HANFORD		382,677	490,804	382,677	792,996
FIELD OFFICE: RL INSTALLATION: HANFORD-100 CATEGORY: CA					
RL-3000-NR	N REACTOR RCRA PERMITS/CLOSURES	0	0	0	0
Subtotal RL, HANFORD-100, CA		0	0	0	0
FIELD OFFICE: RL INSTALLATION: HANFORD-100 CATEGORY: ER					
RL-5025-EB	100-HR-1 CHARACTERIZATION AND ASSESSMENT	0	0	0	0
RL-5026-EB	100-HR-3 CHARACTERIZATION AND ASSESSMENT	16,608	14,838	16,608	14,838
RL-5027-EB	100-DR-1 CHARACTERIZATION AND ASSESSMENT	0	0	0	0
RL-5028-EB	100-BC-1 CHARACTERIZATION AND ASSESSMENT	0	0	0	0
RL-5029-EB	100-BC-5 CHARACTERIZATION AND ASSESSMENT	8,618	7,763	8,618	7,763

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ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
RL-5030-EB	100-KR-1 CHARACTERIZATION AND ASSESSMENT	0	0	0	0
RL-5031-EB	100-KR-4 CHARACTERIZATION AND ASSESSMENT	4,341	6,578	4,341	6,578
RL-5032-EB	100-NR-1 CHARACTERIZATION AND ASSESSMENT	2,750	6,925	2,750	6,925
RL-5033-EB	100-NR-3 CHARACTERIZATION AND ASSESSMENT	0	0	0	0
RL-5034-EB	100-FR-1 CHARACTERIZATION AND ASSESSMENT	1,842	7,195	1,842	7,195
RL-5035-EB	100-BC-2 CHARACTERIZATION AND ASSESSMENT	0	0	0	0
RL-5036-EB	100-DR-2 CHARACTERIZATION AND ASSESSMENT	0	0	0	0
RL-5037-EB	100-KR-2 CHARACTERIZATION AND ASSESSMENT	0	0	0	0
RL-5038-EB	100-NR-2 CHARACTERIZATION AND ASSESSMENT	0	0	0	0
RL-5039-EB	100-KR-3 CHARACTERIZATION AND ASSESSMENT	0	0	0	0
RL-5040-EB	100-IU-1 CHARACTERICATION AND ASSESSMENT	0	0	0	0
RL-5041-EB	100-BC-3 CHARACTERIZATION AND ASSESSMENT	0	0	0	0
RL-5042-EB	100-BC-4 CHARACTERIZATION AND ASSESSMENT	0	0	0	0
RL-5043-EB	100-DR-3 CHARACTERIZATION AND ASSESSMENT	0	0	0	0
RL-5044-EB	100-FR-2 CHARACTERIZATION AND ASSESSMENT	0	0	0	0
RL-5045-EB	100-HR-2 CHARACTERIZATION AND ASSESSMENT	0	0	0	0
RL-5275-EM	100-HR-1 REMEDIAL ACTION	0	0	0	0
RL-5277-EM	100-DR-1 REMEDIAL ACTION	0	0	0	0
RL-5278-EM	100-BC-1 REMEDIAL ACTION	0	0	0	0
RL-5280-EM	100-KR-1 REMEDIAL ACTION	0	0	0	0
RL-5282-EM	100-NR-1 REMEDIAL ACTION	0	0	0	0
RL-5284-EM	100-NR-3 REMEDIAL ACTION	0	0	0	0
RL-5401-EV	183-H SOLAR BASINS D&D	6,700	482	6,700	482
RL-6225-UA	100 AREA ANCILLARY FACILITIES	0	0	0	0
RL-6251-UB	100 AREA REACTORS	500	482	500	482
RL-6375-UC	EFFLUENT FACILITIES	0	0	0	0
Subtotal RL, HANFORD-100, ER		41,359	44,263	41,359	44,263
FIELD OFFICE: RL INSTALLATION: HANFORD-100 CATEGORY: WM					
RL-3008-NR	N REACTOR SOLID WASTE DISPOSAL/CLEANUP	3,028	1,546	3,028	2,147
RL-3012-NR	RESIDUAL MATERIALS MANAGEMENT PROGRAM	1,110	1,929	1,110	2,026
RL-3013-NR	REGULATORY RESPONSE	5,409	7,435	5,409	7,435
RL-3014-NR	N REACTOR FACILITY SHUTDOWN	25,232	16,355	25,232	19,549
RL-3015-NR	NUCLEAR FUEL MANAGEMENT	36,245	31,105	36,245	31,581
Subtotal RL, HANFORD-100, WM		71,024	58,370	71,024	62,738
Subtotal RL, HANFORD-100		112,383	102,633	112,383	107,001
FIELD OFFICE: RL INSTALLATION: HANFORD-1100 CATEGORY: ER					
RL-5100-ED	1100-EM-1 CHARACTERIZATION AND ASSESSMENT	3,000	1,926	3,000	1,926
RL-5325-EP	1100-EM-1 REMEDIAL ACTION	0	770	0	2,658
Subtotal RL, HANFORD-1100, ER		3,000	2,696	3,000	4,584
Subtotal RL, HANFORD-1100		3,000	2,696	3,000	4,584
FIELD OFFICE: RL INSTALLATION: HANFORD-200 CATEGORY: CA					
RL- 404-KE	AIR PERMITTING/COMPLIANCE CHEMICAL PROCESSIN	0	0	0	0
RL- 406-KE	CORRECT ACTIONS FOR CHEM PROCESS PROD FAC (C	0	0	0	0
RL- 410-KE	PART B PERMITTING - PUREX	0	0	0	0
RL- 411-KE	NUCLEAR MTLS PROD PART B PERMITTING - PFP, T	0	0	0	0
RL-9201-2K	SOLID WASTE MANAGEMENT PERMITTING	1,940	0	1,940	0
RL-9207-2K	SOLID MIXED WASTE STORAGE FACILITIES (W-016)	0	0	0	0
Subtotal RL, HANFORD-200, CA		1,940	0	1,940	0
FIELD OFFICE: RL INSTALLATION: HANFORD-200 CATEGORY: ER					
RL-5125-EE	200-BP-1 CHARACTERIZATION AND ASSESSMENT	8,500	6,724	8,500	6,724
RL-5126-EE	200-UP-2 CHARACTERIZATION AND ASSESSMENT	920	0	920	0
RL-5127-EE	200-BP-5 CHARACTERIZATION AND ASSESSMENT	3,890	1,500	3,890	4,591
RL-5128-EE	200-ZP-1 CHARACTERIZATION AND ASSESSMENT	0	0	0	822
RL-5129-EE	200-BP-4 CHARACTERIZATION AND ASSESSMENT	0	0	0	0
RL-5130-EE	200-BP-11 CHARACTERIZATION AND ASSESSMENT	0	0	0	0
RL-5131-EE	200-PO-2 CHARACTERIZATION AND ASSESSMENT	0	0	0	0
RL-5132-EE	200-PO-5 CHARACTERIZATION AND ASSESSMENT	0	0	0	0

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ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
RL-5133-EE	200-TP-1 CHARACTERIZATION AND ASSESSMENT	0	0	0	0
RL-5134-EE	200-BP-2 CHARACTERIZATION AND ASSESSMENT	0	0	0	0
RL-5135-EE	200-TP-4 CHARACTERIZATION AND ASSESSMENT	0	0	0	0
RL-5136-EE	200-TP-2 CHARACTERIZATION AND ASSESSMENT	0	0	0	0
RL-5137-EE	200-ZP-2 CHARACTERIZATION AND ASSESSMENT	0	0	0	0
RL-5138-EE	200-PO-1 CHARACTERIZATION AND ASSESSMENT	0	0	0	0
RL-5139-EE	200-PO-4 CHARACTERIZATION AND ASSESSMENT	0	0	0	0
RL-5140-EE	200-SO-1 CHARACTERIZATION AND ASSESSMENT	0	0	0	0
RL-5141-EE	200-IU-3 CHARACTERIZATION AND ASSESSMENT	0	0	0	0
RL-5375-ES	200-BP-1 REMEDIAL ACTION	0	0	0	0
RL-5378-ES	200-ZP-1 REMEDIAL ACTION	6,500	0	6,500	1,926
RL-5400-EV	A-29 DITCH STABILIZATION AND CLOSURE PLAN	500	0	500	0
RL-5402-EV	NON-RADIOACTIVE DANGEROUS WASTE LANDFILL (NR	1,100	1,637	1,100	1,637
RL-5403-EV	B-POND BY-PASS	800	0	800	0
RL-5404-EV	B-POND STABILIZATION AND CLOSURE	1,600	674	1,600	674
RL-5405-EV	216-A-10 CRIB CLOSURE	0	0	0	0
RL-5406-EV	216-U-12 CRIB CLOSURE	0	626	0	626
RL-5407-EV	216-A-36B CRIB CLOSURE	0	0	0	0
RL-6275-UE	224-B CONCENTRATION FACILITY	0	0	0	0
RL-6276-UE	201-C SEMIWORKS	2,600	1,541	2,600	1,541
RL-6277-UE	233-S FACILITY DECON & DECOM	300	578	300	578
RL-6278-UE	232-Z FACILITY DECOMMISSIONING	500	770	500	770
RL-7006-PE	209-E SURVEILLANCE AND MAINTENANCE (PNL) - N	75	80	75	80
RL-7020-PE	209-E DECONTAMINATION & DECOMMISSIONING (PNL	525	0	525	241
RL-8216-PE	209-E SURVEILLANCE & MAINTENANCE (PNL) - DEF	0	0	0	0
Subtotal RL, HANFORD-200, ER		27,810	14,130	27,810	20,210
FIELD OFFICE: RL INSTALLATION: HANFORD-200 CATEGORY: LD					
RL-1000-F1	200 AREA STEAM SYSTEM (LANDLORD)	1,932	648	1,932	18,879
RL-1001-F1	HANFORD SITE LAUNDRY SYSTEM (LANDLORD)	4,135	1,066	4,135	1,066
RL-1023-F1	200 AREA UNSECURED CORE AREA FAB SHOP	0	0	0	1,057
RL-1024-F1	200 EAST OFFICE FACILITY	69	0	69	200
Subtotal RL, HANFORD-200, LD		6,136	1,714	6,136	21,202
FIELD OFFICE: RL INSTALLATION: HANFORD-200 CATEGORY: WM					
RL- 400-KE	T PLANT WASTEWATER LINE ITEM	180	326	180	326
RL- 401-KE	PFP LIQUID LLW PROCESS WASTE SOLIDIFICATION	564	598	564	598
RL- 402-KE	PFP SOLID WASTE REDUCTION SYSTEM (CP)	507	511	507	511
RL- 407-KE	CHEM PROCESS FACILITY ENVIRONMENTAL COMPLIAN	2,510	3,181	2,510	3,181
RL- 408-KE	DISCONTINUE DISPOSAL TO SOIL COLUMN	923	1,963	923	2,453
RL- 414-KE	CHEM PROCESS SOLID WASTE DISPOSAL	7,819	3,272	7,819	4,102
RL- 415-KE	T-PLANT OPERATIONS	13,284	11,647	13,284	12,654
RL- 416-KE	PUREX/UO3 OPERATIONS	67,059	57,897	67,059	57,897
RL- 417-KE	CHEMICAL PROCESSING CHANGE IN INVENTORY	211	215	211	215
RL- 420-KE	PART B PERMITTING - PUREX	866	397	866	397
RL- 421-KE	PART B PERMITTING - PFP, T-PLANT	298	520	298	520
RL- 422-KE	CHEMICAL PROCESSING CAPITAL SUPPORT	3,935	2,395	3,935	2,395
RL- 423-KE	AIR PERMITTING/COMPLIANCE CHEMICAL PROCESSIN	1,385	553	1,385	553
RL- 424-KE	OUTDOOR STORAGE OF WASTE EQUIPMENT	1,031	1,445	1,031	1,445
RL- 425-KE	WASTE STATUS OF PFP SPECIAL NUCLEAR MATERIAL	568	241	568	241
RL- 428-KE	DEFENSE PROGRAMS SUPPORT	-30,000	0	-30,000	0
RL- 430-KE	GENERAL PROGRAM AND PROJECT SUPPORT	25,881	15,443	25,881	19,960
RL- 431-KE	FACILITY OPERATIONS DIVISION NEPA ACTIVITIES	3,564	3,123	3,564	3,123
RL- 435-KE	PFP OPERATIONS	93,705	91,290	93,705	91,290
RL- 440-KE	PUREX STEAM CONDENSATE TREATMENT FACILITY	5,168	0	5,168	0
RL- 441-KE	221-T VENTILATION UPGRADE (94-C-077)	350	0	350	63
RL- 442-KE	PFP OUTYEAR LINE ITEM PROJECTS	450	85	450	578
RL- 443-KE	MAJOR PROCESS UPGRADES	400	0	400	453
RL- 444-KE	221-T RCRA DECON CELL	200	193	200	193
RL-8164-PW	TRU WASTE STORAGE	850	0	850	120
RL-9126-1D	PROJECT SUPPORT- HEC LINE ITEMS (1W1D3)	2,836	3,129	2,836	3,129
RL-9127-1D	B PLANT CONTINUITY OF OPERATIONS	6,982	8,034	6,982	8,034
RL-9128-1D	B PLANT PRETREATMENT	0	0	0	0

APPENDIX F (Continued)

ACTIVITY DATA SHEETS
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ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
RL-9129-1D	OPERATIONS- TREATMENT	19,014	29,153	19,014	29,153
RL-9130-1D	PROJECT SUPPORT- PLANT AND PROCESS	2,110	800	2,110	1,961
RL-9131-1D	B PLANT CANYON CRANE REPLACEMENT	6,260	0	6,260	0
RL-9132-1D	SOIL COLUMN DISPOSAL PLAN PROJECTS (W1D3E)	0	0	0	0
RL-9133-1D	PROJECT SUPPORT- SAFETY CLASS VENT. UPGRADES	0	0	0	0
RL-9134-1D	B PLANT TRUEX UPGRADE	0	0	0	0
RL-9137-1D	PARTITIONING FACILITY FOR TANK WASTE	0	0	0	15,918
RL-9138-1D	DST STORAGE AGING WASTE TRANSFER LINES	6,540	144	6,540	144
RL-9139-1D	244-AR VAULT PRETREATMENT ACTIVITIES	0	0	0	0
RL-9141-1D	244-AR VAULT OPERATIONS	0	0	0	0
RL-9142-1D	MAJOR B PLANT UPGRADES	200	48	200	48
RL-9150-1H	DEFENSE HIGH-LEVEL WASTE TECHNOLOGY (W1H)	10,637	23,986	10,637	23,986
RL-9151-1H	W151 101-AZ RETRIEVAL SYSTEM PROJECT	7,300	4,160	7,300	4,160
RL-9152-1H	DOUBLE SHELL TANK RETRIEVAL SYSTEMS	200	3,419	200	3,419
RL-9175-1P	GROUT DISPOSAL PROGRAM	31,000	57,528	31,000	57,528
RL-9176-1P	GROUT DISPOSAL PROGRAM (W1P)	0	800	0	800
RL-9190-1V	HANFORD WASTE VITRIFICATION PLANT OPERATIONS	1,300	2,898	1,300	2,898
RL-9200-2K	LAND DISPOSAL ALTERNATIVES	75	5	75	5
RL-9202-2K	SODIUM INVENTORY REDUCTION	220	732	220	1,905
RL-9203-2K	SOLID MIXED WASTE STORAGE FACILITIES	2,002	2,207	2,002	2,207
RL-9204-2K	SOLID WASTE BURIAL GROUND CLOSURE	0	0	0	4,822
RL-9205-2K	CONTACT-HANDLED TRU CHARACTERIZATION	200	3,571	200	3,571
RL-9206-2K	CONTACT-HANDLED RETRIEVAL FACILITIES	0	0	0	6,141
RL-9208-2K	WASTE RECEIVING AND PROCESSING FACILITY MODU	11,500	29,597	11,500	29,597
RL-9209-2K	RMW CHARACTERIZATION AND INCINERATION	90	751	90	751
RL-9210-2K	SOLID WASTE OPERATIONS	3,498	11,573	3,498	11,573
RL-9211-2K	TRUPACT SHIPMENTS TO WIPP	0	0	0	0
RL-9212-2K	ADVANCED LOW LEVEL WASTE DISPOSAL	0	0	0	1,218
RL-9214-2K	RMW DISPOSAL TRENCH (W-025)	50	0	50	0
RL-9215-2K	HAZARDOUS WASTE MANAGEMENT	350	2,045	350	2,045
RL-9216-2K	TRU WASTE MANAGEMENT	100	2,036	100	2,036
RL-9217-2K	LOW LEVEL WASTE VOLUME REDUCTION	0	2,115	0	2,115
RL-9218-2K	WASTE RECEIVING AND PROCESSING FACILITY MODU	0	0	0	21,139
RL-9219-2K	SOLID WASTE MANAGEMENT PERMITTING	0	1,542	0	1,542
RL-9220-2K	SOLID WASTE SAFETY ANALYSIS SUPPORT	1,800	3,371	1,800	3,371
RL-9221-2K	SOLID WASTE NEPA DOCUMENTATION	150	0	150	0
RL-9222-2K	SPECIAL CASE WASTE STORAGE FROM HOT CELLS	0	1,282	0	1,282
RL-9223-2K	RH-TRU CHARACTERIZATION/RETRIEVAL FACILITY	0	0	0	193
RL-9224-2K	RADIOACITVE SOLID RCRA/TSCA THERMAL TREATMEN	0	0	0	1,156
RL-9405-4A	ENVIR SURV & CONTROL-242-S & 242-T EVAPORATO	634	643	634	643
RL-9446-4L	ENVIRONMENTAL LABORATORY UPGRADES (W4L)	13,694	5,715	13,694	6,719
RL-9500-5C	CESIUM CAPSULE RECOVERY	0	0	0	0
RL-9550-5E	Waste Encapsulation & Storage Facility	4,050	3,942	4,050	3,942
RL-9645-6L	222-S LABORATORY FACILITY COMPLEX (W6L)	9,434	12,362	9,434	17,703
RL-9646-6L	222-S LABORATORY HVAC/ELECTRICAL UPGRADE (W-	1,366	200	1,366	193
Subtotal RL, HANFORD-200, WM		345,300	413,083	345,300	480,315
Subtotal RL, HANFORD-200		381,186	428,927	381,186	521,727
FIELD OFFICE: RL INSTALLATION: HANFORD-300 CATEGORY: CA					
RL-8005-PC	LIGHT BALLAST PCB CLEANUP AND REMOVAL (PNL)	150	0	150	0
RL-8100-PC	AIR AND SEWAGE MONITORING MULTIPROGRAM BUILD	3,045	50	3,045	50
Subtotal RL, HANFORD-300, CA		3,195	50	3,195	50
FIELD OFFICE: RL INSTALLATION: HANFORD-300 CATEGORY: ER					
RL-5075-EC	300-FF-1 CHARACTERIZATION AND ASSESSMENT	5,943	6,103	5,943	6,103
RL-5076-EC	300-FF-5 CHARACTERIZATION AND ASSESSMENT	4,588	5,865	4,588	5,865
RL-5077-EC	300-FF-3 CHARACTERIZATION AND ASSESSMENT	0	0	0	0
RL-5078-EC	300-FF-2 CHARACTERIZATION AND ASSESSMENT	0	0	0	0
RL-5300-EN	300-FF-1 REMEDIAL ACTION	500	0	500	0
RL-5301-EN	300-FF-5 REMEDIAL ACTION	0	0	0	0
RL-5303-EN	300-FF-2 REMEDIAL ACTION	2,000	0	2,000	0

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ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
RL-5408-EV	300 AREA EFFLUENT TREATMENT	0	289	0	289
RL-7009-PE	324 & 325 BUILDING HOT CELL RESTORATION PROG	5,550	0	5,550	0
RL-7010-PE	SURVEILL/MAINT 324/325 BLDGS HOT CELLS - NON	750	613	750	761
RL-8172-PE	327 BUILDING SURVEILLANCE AND MAINTENANCE (P	0	0	0	0
RL-8182-PE	324 SHIELDED MATERIAL FACILITY CLEAN-OUT	0	0	0	0
RL-8217-PE	SURVEILL & MAINT, 324/325 BUILDING HOT CELLS	0	0	0	0
Subtotal RL, HANFORD-300, ER		19,331	12,870	19,331	13,018
FIELD OFFICE: RL INSTALLATION: HANFORD-300 CATEGORY: LD					
RL-1007-F1	300 AREA ELECTRICAL UPGRADE	5,659	2,831	5,659	12,267
RL-1012-F1	SAFETY ANALYSIS REPORTS (NUCLEAR FACILITIES)	0	0	0	0
RL-1013-F1	SAFETY & ENVIRONMENTAL COMPLIANCE-300 AREA L	1,000	2,680	1,000	2,938
RL-1014-F1	324 FACILITY COMPLIANCE/RENOVATION	0	0	0	72
RL-1015-F1	325 FACILITY COMPLIANCE/RENOVATION	0	0	0	1,557
RL-1017-F1	SAFETY & ENVIRONMENTAL UPGRADES	2,000	72	2,000	201
RL-1041-F1	FIRE SEPARATIONS 324 AND 325 BUILDINGS	0	0	0	0
Subtotal RL, HANFORD-300, LD		8,659	5,583	8,659	17,035
FIELD OFFICE: RL INSTALLATION: HANFORD-300 CATEGORY: WM					
RL-2003-AR	308 BUILDING OPERATIONS	525	636	525	636
RL-7008-PW	324 BUILDING B-CELL	0	2,079	0	9,847
RL-7014-PW	LIQUID WASTE SOURCE CONTROL	534	0	534	0
RL-8009-PW	RMW STORAGE TANK UPGRADES (PNL)	475	0	475	963
RL-8010-PW	BUILDING UTILITIES—PHASE I—FACILITY COMPLI	32	0	32	0
RL-8011-PW	329 BUILDING COMPLIANCE (PNL)	3,200	2,489	3,200	2,489
RL-8017-PW	HAZARDOUS WASTE TREATMENT FACILITY (PNL)	3,030	102	3,030	680
RL-8211-PW	ADVANCED HLW TREATMENT TECHNOLOGIES	0	0	0	0
RL-8221-PW	327 BUILDING SURVEILLANCE AND MAINTENANCE (P	0	1,156	0	1,156
RL-9080-2M	300 AREA RADIOACTIVE LIQUID WASTE FACILITY	2,400	2,500	2,400	3,812
Subtotal RL, HANFORD-300, WM		10,196	8,962	10,196	19,583
Subtotal RL, HANFORD-300		41,381	27,465	41,381	49,686
Subtotal RL		932,662	1,072,536	932,662	1,518,326
FIELD OFFICE: SAN INSTALLATION: CATEGORY: ER					
SAN-0-06	AGREEMENT IN PRINCIPAL	0	0	0	0
SAN-0-12	Contractual Services-Environmental Restorati	0	0	0	0
Subtotal SAN, , ER		0	0	0	0
FIELD OFFICE: SAN INSTALLATION: CATEGORY: WM					
SAN-0-05	AGREEMENT IN PRINCIPAL	0	0	0	0
SAN-0-07	AGREEMENT IN PRINCIPAL	0	2,550	0	2,550
Subtotal SAN, , WM		0	2,550	0	2,550
Subtotal SAN,		0	2,550	0	2,550
FIELD OFFICE: SAN INSTALLATION: CANOGA PARK, CA CATEGORY: ER					
SAN-5004-WA	Atomics International DeSoto Groundwater Ass	0	0	0	0
Subtotal SAN, CANOGA PARK, CA, ER		0	0	0	0
Subtotal SAN, CANOGA PARK, CA		0	0	0	0
FIELD OFFICE: SAN INSTALLATION: ENERGY TECHNOLOGY INFORMATION CENTE CATEGORY: WM					
SAN-4017-	Tiger Team REsponse	0	0	0	200
Subtotal SAN, ENERGY TECHNOLOGY INFORMATION CENTE, WM		0	0	0	200
Subtotal SAN, ENERGY TECHNOLOGY INFORMATION CENTE		0	0	0	200

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ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
FIELD OFFICE: SAN INSTALLATION: GENERAL ATOMICS CATEGORY: ER					
SAN-4-AA	Hot Cell Decontamination and Decommissioning	1,435	2,207	1,435	3,468
Subtotal SAN, GENERAL ATOMICS, ER		1,435	2,207	1,435	3,468
Subtotal SAN, GENERAL ATOMICS		1,435	2,207	1,435	3,468
FIELD OFFICE: SAN INSTALLATION: GENERAL ELECTRIC CATEGORY: ER					
SAN-5-AA	Hot Cell/Glove Box Decontamination and Decom	523	1,000	523	4,508
SAN-8-AA	Hot Cell/Glove Box Surveillance and Maintena	72	39	72	39
Subtotal SAN, GENERAL ELECTRIC, ER		595	1,039	595	4,547
Subtotal SAN, GENERAL ELECTRIC		595	1,039	595	4,547
FIELD OFFICE: SAN INSTALLATION: LAWRENCE BERKELY LAB CATEGORY: CA					
SAN-2002-	AIR TOXICS FACILITY ASSESSMENT & REHABILITAT	3,975	0	3,975	0
SAN-2006-	SANITARY SEWER MONITORING SYSTEM	505	0	505	0
SAN-2011-	REPLACE, MONITOR, OR REMOVE UG TANKS - PHASE	500	0	500	0
Subtotal SAN, LAWRENCE BERKELY LAB, CA		4,980	0	4,980	0
FIELD OFFICE: SAN INSTALLATION: LAWRENCE BERKELY LAB CATEGORY: ER					
SAN-2004-A	SEWER PIPE ASSESSMENT	0	0	0	0
SAN-2012-A	ENV MONITORING FACILITIES - ASSESSMENT	1,471	2,000	1,471	2,000
SAN-2012-B	ENV MONITORING FACILITIES - REMEDIATION	0	0	0	0
SAN-2015-	WASTE HANDLING FACILITY CLOSURE	88	700	88	700
Subtotal SAN, LAWRENCE BERKELY LAB, ER		1,559	2,700	1,559	2,700
FIELD OFFICE: SAN INSTALLATION: LAWRENCE BERKELY LAB CATEGORY: WM					
SAN-2001-	HAZARDOUS WASTE HANDLING FACILITY	0	0	0	0
SAN-2016-	WM BASE DISPOSAL	0	1,120	0	1,120
SAN-2017-A	WASTE MINIMIZATION - PLANNING	0	300	0	300
SAN-2018-	WM BASE CONTINUITY OF OPERATIONS	0	4,463	0	4,463
SAN-2019-	INSTALL ON-SITE DEIONIZATION REGENERATION EQ	0	0	0	400
Subtotal SAN, LAWRENCE BERKELY LAB, WM		0	5,883	0	6,283
Subtotal SAN, LAWRENCE BERKELY LAB		6,539	8,583	6,539	8,983
FIELD OFFICE: SAN INSTALLATION: LAWRENCE BERKLEY LABORATORY CATEGORY: WM					
SAN-2020-	Tiger Team Response	0	400	0	400
Subtotal SAN, LAWRENCE BERKLEY LABORATORY, WM		0	400	0	400
Subtotal SAN, LAWRENCE BERKLEY LABORATORY		0	400	0	400
FIELD OFFICE: SAN INSTALLATION: LAWRENCE LIVERMORE NATIONAL LAB CATEGORY: CA					
SAN-1000-	Maint. of Compliance thru Sewer Effluent Ala	1,540	0	1,540	0
SAN-1001-	Effluent Monitoring Compliance Assessments	1,930	0	1,930	0
SAN-1002-	Compliance Stack Monitoring	5,035	0	5,035	0
SAN-1004-	Permit/Relocate High Explosive Burn Facility	100	0	100	0
SAN-1005-	Tank Upgrades Project	4,000	10,200	4,000	10,200
SAN-1006-	LLNL Sewer Pipe Rehabilitation	5,350	5,500	5,350	5,500
Subtotal SAN, LAWRENCE LIVERMORE NATIONAL LAB, CA		17,955	15,700	17,955	15,700
FIELD OFFICE: SAN INSTALLATION: LAWRENCE LIVERMORE NATIONAL LAB CATEGORY: ER					
SAN-1207-	LLNL Main Site Ground Water Project—Undergr	400	560	400	560
SAN-1208-	LLNL Main Site Ground Water Project—LLNL Ma	0	0	0	0
SAN-1209-	LLNL Main Site Ground Water Project—Cleanup	5,170	3,970	5,170	4,070
SAN-1210-	LLNL Main Site Ground Water Project—Main Si	3,910	5,460	3,910	7,120
SAN-1211-	LLNL Site Ground Water Project—Cleanup O&M	3,760	4,400	3,760	4,900
SAN-1212-	LLNL Site Ground Water Project O&M Monitorin	1,600	2,130	1,600	2,290
SAN-1213-	ENVIRONMENTAL RESTORATION BUILDING 612 CLOSU	440	650	440	650
SAN-1214-	Site 300 Environmental Restoration—Pit7/Bld	2,040	1,060	2,040	1,060
SAN-1215-	LLNL Site 300 Env Rest Pit 7 & B850/EFA clea	0	755	0	755
SAN-1216-	Environmental Restoration—Bldg 801 Assessme	1,000	1,195	1,000	1,340

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AN-1217-	Environmental Restoration Building 801 Clean	0	0	0	330
SAN-1218-	Environmental Restoration Building 833 Asses	880	930	880	930
SAN-1219-	Environmental Restoration Building 833 Clean	0	535	0	535
SAN-1220-	LLNL Site 300 Environmental Restoration B834	640	0	640	0
SAN-1221-	LLNL Site 300 Environmental Restoration B834	320	755	320	755
SAN-1224-	LLNL Site 300 Environmental Restoration GSA	560	0	560	0
SAN-1225-	LLNL Site 300 Environmental Restoration GSA	160	755	160	755
SAN-1226-	LLNL Site 300 Environmental Restoration Pit	720	0	720	0
SAN-1227-	LLNL Site 300 Environmental Restoration Pit	160	770	160	770
SAN-1228-	LLNL Site 300 Env Rest HE Process Area Asses	480	0	480	0
SAN-1229-	LLNL Site 300 Env Rest HE Process Area Clean	190	755	190	755
SAN-1230-	LLNL Site 300 Environmental Restoration HE B	790	1,335	790	1,335
SAN-1231-	LLNL Site 300—Landfill Closures	80	0	80	0
Subtotal SAN, LAWRENCE LIVERMORE NATIONAL LAB, ER		23,300	26,015	23,300	28,910
FIELD OFFICE: SAN INSTALLATION: LAWRENCE LIVERMORE NATIONAL LAB CATEGORY: WM					
SAN-1402-	Continuity of Operations	4,195	6,057	4,195	7,905
SAN-1403-	Treatment	3,245	3,388	3,245	7,067
SAN-1404-	Storage	9,470	7,587	9,470	9,850
SAN-1405-	Disposal	5,680	12,220	5,680	15,800
SAN-1406-	Waste Minimization-PLANNING	2,990	1,639	2,990	1,639
SAN-1407-	Decontamination and Waste Treatment Facility	5,060	200	5,060	16,203
SAN-1408-	Capital Equipment	0	0	0	0
SAN-1411-	Mixed Waste Treatment Facility	0	0	0	1,150
Subtotal SAN, LAWRENCE LIVERMORE NATIONAL LAB, WM		30,640	31,091	30,640	59,614
Subtotal SAN, LAWRENCE LIVERMORE NATIONAL LAB		71,895	72,806	71,895	104,224
FIELD OFFICE: SAN INSTALLATION: SANTA SUSANA FIELD LAB CATEGORY: CA					
SAN-4000-AA	SCTI WASTE WATER DISPOSAL SYSTEM	0	0	0	0
SAN-4002-AA	Secondary Containment	0	0	0	0
SAN-4007-AA	Corrective Actions at Permitted Facilities	25	0	25	0
Subtotal SAN, SANTA SUSANA FIELD LAB, CA		25	0	25	0
FIELD OFFICE: SAN INSTALLATION: SANTA SUSANA FIELD LAB CATEGORY: ER					
SAN-4003-AA	Bldg. 059 D&D	2,294	0	2,294	0
SAN-4004-AA	Bldg. 024 Surveillance & Maintenance	15	16	15	16
SAN-4004-WA	Bldg. 024 Surveillance & Maintenance	0	0	0	0
SAN-4005-AA	RMDF Surveillance & Maintenance	226	176	226	176
SAN-4005-AB	RMDF Assessments	0	0	0	0
SAN-4005-AC	RMDF D&D	733	479	733	479
SAN-4005-WA	RMDF Surveillance & Maintenance	0	0	0	0
SAN-4006-AA	SSFL Work Areas Surveillance & Maintenance	15	16	15	16
SAN-4006-AB	SSFL Work Area Assessments	0	30	0	30
SAN-4006-AC	SSFL Work Area Decontamination	0	466	0	466
SAN-4006-WA	SSFL Work Areas Surveillance & Maintenance	0	0	0	0
SAN-4006-WB	SSFL Work Area Assessments	0	0	0	0
SAN-4006-WC	SSFL Work Area Decontamination	0	0	0	0
SAN-4009-AA	SSFL Groundwater Assessments	0	161	0	161
SAN-4009-AB	SSFL Groundwater Cleanup	0	52	0	52
SAN-4009-WA	SSFL Groundwater Assessments	0	0	0	0
SAN-4009-WB	SSFL Groundwater Cleanup	0	0	0	0
SAN-4013-AA	Environmental Monitoring	25	26	25	26
SAN-4014-AA	Environmental Management and Planning	300	747	300	747
SAN-4014-WA	Environmental Management and Planning	0	0	0	0
SAN-5000-AA	Sodium Disposal Facility Assessment	0	0	0	0
SAN-5000-AB	Sodium Disposal Facility Cleanup	2,014	1,000	2,014	1,000
SAN-5001-AA	Bldg. 005 Assessments	52	0	52	0
SAN-5001-AB	Bldg. 005 D&D	344	0	344	0
SAN-5001-AC	Bldg. 005 Surveillance and Maintenance	20	0	20	0
SAN-5001-WC	Bldg. 005 Surveillance and Maintenance	0	0	0	0
SAN-5002-AA	Bldg. 023 Surveillance and Maintenance	10	10	10	10
SAN-5002-AB	Bldg. 023 Assessments	30	0	30	0

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SAN-5002-AC	Bldg. 023 D&D	0	100	0	100
SAN-5003-AA	D&D of Rockwell International Hot ab	3,000	285	3,000	1,778
SAN-5003-AX	D&D of Rockwell International Hot Lab	0	1,493	0	0
SAN-5006-AA	D&D of Flash Hydropyrolysis Process Dev. & D	0	200	0	200
SAN-5007-AA	D&D of Molten Salt Process Development Unit	0	450	0	450
Subtotal SAN, SANTA SUSANA FIELD LAB, ER		9,078	5,707	9,078	5,707
FIELD OFFICE: SAN INSTALLATION: SANTA SUSANA FIELD LAB CATEGORY: WM					
SAN-4008-AA	Disposal of Cold Traps	1,253	0	1,253	0
SAN-4010-AA	Disposal of Alkali Metal	0	0	0	0
SAN-4011-AA	Disposal of Surplus Sodium	0	300	0	300
SAN-4016-AA	Continuity of Waste Operations	3,287	271	3,287	271
Subtotal SAN, SANTA SUSANA FIELD LAB, WM		4,540	571	4,540	571
Subtotal SAN, SANTA SUSANA FIELD LAB		13,643	6,278	13,643	6,278
FIELD OFFICE: SAN INSTALLATION: STANFORD LINEAR ACCELERATOR CENTER CATEGORY: ER					
SAN-3016-AA	Environmental Restoration Assessment Program	0	94	0	94
SAN-3022-AA	CONTAMINATED GROUNDWATER CLEANUP EVALUATION	0	0	0	0
SAN-3023-AA	Master Substation PCB Remediation	0	0	0	0
Subtotal SAN, STANFORD LINEAR ACCELERATOR CENTER, ER		0	94	0	94
FIELD OFFICE: SAN INSTALLATION: STANFORD LINEAR ACCELERATOR CENTER CATEGORY: WM					
SAN-3008-AA	Hazardous Waste Disposal Program	264	1,149	264	1,149
SAN-3009-AA	Waste Minimization Planning	84	50	84	284
SAN-3014-AA	Waste Water Treatment Facility Shelter	0	0	0	66
SAN-3015-AA	PCB Waste Removal & Disposal	0	150	0	343
SAN-3017-AA	Oil/Water Separator, IR-6 & IR-12	0	0	0	165
SAN-3018-AA	PCB MANAGEMENT	0	0	0	99
SAN-3019-AA	HAZARDOUS WASTE ACCUMULATION AREA	0	0	0	0
SAN-3020-AA	RADIOACTIVE MATERIAL MANAGEMENT	0	296	0	296
SAN-3021-AA	RADIOACTIVE WASTE DISPOSAL	0	361	0	361
Subtotal SAN, STANFORD LINEAR ACCELERATOR CENTER, WM		348	2,006	348	2,763
Subtotal SAN, STANFORD LINEAR ACCELERATOR CENTER		348	2,100	348	2,857
FIELD OFFICE: SAN INSTALLATION: UNIVERSITY OF CALIFORNIA AT DAVIS CATEGORY: ER					
SAN-1-AA	Environmental Restoration Assessment	1,833	1,138	1,833	1,138
SAN-2-AA	Environmental Restoration Cleanup	3,600	2,500	3,600	2,500
Subtotal SAN, UNIVERSITY OF CALIFORNIA AT DAVIS, ER		5,433	3,638	5,433	3,638
Subtotal SAN, UNIVERSITY OF CALIFORNIA AT DAVIS		5,433	3,638	5,433	3,638
Subtotal SAN		99,888	99,601	99,888	137,145
FIELD OFFICE: SR INSTALLATION: SAVANNAH RIVER SITE CATEGORY: CA					
SR-1-HQ	GENERAL PLANT PROJECTS	0	0	0	0
SR- 236-AA	Reactor Effluent Cooling Thermal Mitigation	0	0	0	0
Subtotal SR, SAVANNAH RIVER SITE, CA		0	0	0	0
FIELD OFFICE: SR INSTALLATION: SAVANNAH RIVER SITE CATEGORY: ER					
SR- 149-C	ER-Railroad Crosstie Disposal	1,300	0	1,300	0
SR- 245-C	ER-Sanitary Landfill Closure	500	1,650	500	2,650
SR- 246-C	ER-Sanitary Landfill Groundwater Remediation	1,500	1,986	1,500	1,986
SR- 247-C	ER-LLRWDF Closure	1,100	1,318	1,100	2,318
SR- 251-C	ER-Closure Monitoring and Maintenance	788	200	788	1,200
SR- 252-D	ER-D&D Program Support	0	600	0	679
SR- 301-C	ER-M-Area Settling Basin	0	0	0	0
SR- 302-C	ER-A/M - Area Groundwater Remediation	3,200	3,944	3,200	5,344
SR- 303-A	ER-Metallurgical Laboratory Basin Assessment	300	0	300	0
SR- 303-C	ER-Metallurgical Laboratory Basin Closure	0	0	0	0
SR- 304-A	ER-Acid/Caustic Basins Assessment	200	0	200	0
SR- 304-C	ER-Acid/Caustic Basins Closure	0	0	0	0

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SORTED BY FIELD OFFICE, INSTALLATION, AND CATEGORY
(dollars in thousands)

ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
SR- 305-C	ER-Mixed Waste Management Facility Closure	0	0	0	0
SR- 306-AA	ER-RCRA/CERCLA Basin Investigations	2,257	2,200	2,257	4,019
SR- 306-AB	ER-RCRA/CERCLA Pits/Piles Investigations	2,250	2,200	2,250	4,020
SR- 306-AC	ER-RCRA/CERCLA Tank/Burial Ground Investigat	2,250	2,200	2,250	4,020
SR- 306-AD	ER-RCRA/CERCLA Miscellaneous Investigations	2,250	2,200	2,250	4,020
SR- 307-A	ER-PB&C And Technical upport	4,287	3,000	4,287	4,840
SR- 309-A	ER-SRL Seepage Basins Assessment	200	0	200	0
SR- 309-C	ER-SRL Seepage Basins Closure	1,375	2,265	1,375	2,265
SR- 310-A	ER-New TNX Seepage Basin Assessment	200	0	200	0
SR- 310-C	ER-New TNX Seepage Basin Closure	400	712	400	712
SR- 314-A	ER-Underground Storage Tanks Assessment	800	400	800	400
SR- 314-C	ER-Underground Storage Tanks	1,660	800	1,660	1,800
SR- 316-A	ER-F/H Seepage Basin Assessment	0	0	0	0
SR- 316-C	ER-F/H Seepage Basin Closure	3,600	3,600	3,600	3,600
SR- 320-A	ER-Bingham Pump Outage Pits Assessment	0	0	0	300
SR- 320-C	ER-Bingham Pump Outage Pits Remediation	0	0	0	0
SR- 326-D	ER-D&D SRL SED I and SED II Facilities	2,921	0	2,921	2,921
SR- 328-D	ER-D&D the SRL CPF Facility	0	0	0	0
SR- 329-D	ER-Surveilance and Maintenance of HWCTR	250	250	250	250
SR- 331-D	ER-D & D R Reactor Support Facilities	0	0	0	0
SR- 332-A	ER-Inactive Reactor Seepage Basins Assessmen	0	0	0	900
SR- 332-C	ER-Inactive Reactor Seepage Basins Remediati	0	0	0	0
SR- 339-A	ER-Data Base Management	400	400	400	400
SR- 342-C	ER-RCRA/CERCLA Remediations	0	915	0	7,000
SR- 345-D	ER-Decontamination and Decommissioning of HW	0	0	0	1,137
SR- 349-D	ER-POWER D & D 284-F Powerhouse	0	0	0	0
SR- 350-D	ER-REACTORS D & D 412-D Heavy Water Facility	0	0	0	0
SR- 351-C	ER-MWMF Groundwater Remediation	2,500	2,300	2,500	2,800
SR- 352-D	ER-D & D and Removal of Buildling 677-T and	0	0	0	0
SR- 354-D	ER-D & D and Removal, Building 672-T	0	0	0	0
SR- 355-D	ER-Decontamination and Decommissioning of Tr	0	0	0	0
SR- 408-D	ER-Waste Transfer	10,200	0	10,200	0
SR- 409-D	ER-Separations - D&D - Tritium Facility	0	0	0	0
SR- 469-C	ER-TNX Groundwater Remediation	500	620	500	2,620
SR- 470-C	ER-F/H-Area Groundwater Remediation	3,672	5,100	3,672	5,421
SR- 478-A	ER-State Reimbursement for FFA	2,000	1,500	2,000	2,000
SR- 479-A	ER-DOE ER Program Management Support	2,400	4,700	2,400	4,700
SR- 607-A	ER-Risk Assessment of Environmental Toxicolo	0	0	0	2,325
Subtotal SR, SAVANNAH RIVER SITE, ER		55,260	45,060	55,260	76,647
FIELD OFFICE: SR INSTALLATION: SAVANNAH RIVER SITE CATEGORY: WM					
SR-1-AA	WM H-Area General	27,904	34,066	27,904	38,500
SR-1-AB	WM High Level Waste Storage (HLW) - H-Area	20,575	26,578	20,575	26,576
SR-1-AD	WM Effluent Treatment Facility Building Mai	3,571	2,306	3,571	2,306
SR-1-AE	WM Solid Waste Disposal Facility - Area Gen	4,285	7,554	4,285	7,554
SR-1-AF	WM Environmental Support	824	1,205	824	1,205
SR-1-AH	WM F-Area General	14,452	15,031	14,452	15,031
SR-1-AI	WM High Level Waste (HLW) Storage - F Area	12,782	15,137	12,782	15,137
SR-2-AA	WM Evaporation - H-Area	11,496	12,262	11,496	12,262
SR-2-AB	WM Replacement High Level Waste (HWL) Evapo	0	0	0	1,510
SR-2-AL	WM Evaporation - F-Area	5,258	6,334	5,258	6,334
SR-2-LA	WM Replacement High Level Waste (HLW) Evapo	14,145	9,795	14,145	19,855
SR-3-AA	WM Waste Transfer Program - H-Area	0	2,052	0	17,603
SR-3-AB	WM Waste Transfer Program - F-Area	0	1,670	0	1,670
SR-5-AA	WM Salt Removal - H-Area	0	5,066	0	14,072
SR-5-AB	WM Salt Removal - F-Area	0	0	0	7,713
SR-9-AA	WM In-Tank Precipitation/Extended Sludge Pr	22,284	26,316	22,284	26,316
SR- 12-AA	WM New Waste Transfer Facilities	0	8,082	0	6,694
SR- 12-LA	WM New Waste Transfer Facilities	0	0	0	0
SR- 13-AA	WM Mixed Waste Storage	1,332	431	1,332	431
SR- 15-AA	WM Solid Waste Disposal Facility	22,297	27,404	22,297	27,404
SR- 15-LA	WM Solid Waste Disposal Facility Expansion	0	0	0	0
SR- 15-LB	WM Solid Waste Disposal Facility - Project	0	0	0	3,100

ACTIVITY DATA SHEETS
SORTED BY FIELD OFFICE, INSTALLATION, AND CATEGORY
(dollars in thousands)

ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
SR- 15-LC	WM Solid Waste Disposal Facility - Project	0	0	0	0
SR- 16-AA	WM Low-Level Waste Disposal	13,352	13,000	13,352	15,104
SR- 17-AA	WM Effluent Treatment Facility (ETF) Operat	22,180	21,040	22,180	21,040
SR- 18-AA	WM Hazardous Waste Storage	3,451	1,373	3,451	1,373
SR- 19-AA	WM Consolidated Incineration Facility Suppo	0	7,345	0	16,321
SR- 20-AA	WM Transuranic (TRU) Waste Facility Support	0	1,000	0	1,525
SR- 21-AA	WM Waste Preparation Facility Support and O	0	0	0	0
SR- 22-AA	WM Transuranic (TRU) Waste Certification Fa	1,825	1,925	1,825	1,925
SR- 22-AB	WM Transuranic (TRU) Waste Storage and Hand	1,825	1,925	1,825	1,925
SR- 25-AA	WM Hazardous Low Level Waste (LLW) Processi	0	2,537	0	2,537
SR- 25-LA	WM Hazardous Low-Level Waste Processing Tan	10,100	12,300	10,100	22,880
SR- 26-AA	WM Storm Water System Upgrade-Design Suppor	0	0	0	0
SR- 26-LA	WM Storm Water System Upgrade	0	0	0	0
SR- 27-AA	WM High Level Waste Removal from Filled Was	0	0	0	0
SR- 27-LA	WM High Level Waste Removal from Filled Was	0	0	0	3,000
SR- 27-LB	WM High Level Waste From Filled Tanks - Pha	0	0	0	0
SR- 28-AA	WM Inter-Area Line Upgrade - Design Support	0	0	0	100
SR- 28-LA	WM Inter-Area Line Upgrade	2,100	3,168	2,100	7,340
SR- 29-AA	WM Tank Farm Services - Upgrades/Design Sup	0	0	0	0
SR- 29-LA	WM Tank Farm Services Upgrades	0	0	0	0
SR- 30-LA	WM Effluent Treatment Facility (ETF) Filtra	0	0	0	0
SR- 33-AA	DOE - Headquarters Management Initiative	0	0	0	0
SR- 34-AA	DOE - SR Interim Waste Management/ DWPF cos	12,576	10,646	12,576	10,646
SR- 35-AA	SRL ITP/ESP (DWPF Feed Prep/Operation) Supp	2,100	0	2,100	2,200
SR- 36-AA	RX Waste Handling	1,340	0	1,340	0
SR- 37-AA	RM Effluent Toxicity Reduction Study	571	50	571	50
SR- 38-AA	RM Waste Filtration & Stabilization Facility	50	50	50	200
SR- 40-AA	SEP Low-Level and Intermediate-Level Waste H	4,200	0	4,200	0
SR- 41-AA	SEP TRU Waste Handling	1,100	0	1,100	0
SR- 43-AA	SRL Waste Qualification	5,500	5,000	5,500	5,000
SR- 44-AA	SRL Defense Waste Processing Facility	15,706	8,000	15,706	19,500
SR- 46-AA	SRL HLW Storage/Tank Farm Support	1,600	3,600	1,600	3,600
SR- 47-AA	SRL Low-Level Waste Storage/Disposal Burial	1,530	1,530	1,530	1,530
SR- 50-AA	SRL Performance Improvements in HLW Processi	1,500	2,200	1,500	2,200
SR- 51-AA	SRL HLW Process Development Analytical Supp	1,000	1,000	1,000	1,000
SR- 52-AA	SRL Production Monitoring Support	250	250	250	250
SR- 54-AA	SRL Replace/Upgrade 776-A Waste Handling Fa	42	89	42	89
SR- 55-AA	SRL Safety & Continuity	1,500	2,000	1,500	2,000
SR- 58-AA	SRL Tank Farms Remote Equipment	1,000	1,200	1,000	1,200
SR- 62-AA	SRL Waste Management Operations	792	801	792	801
SR- 66-AA	Tritium Waste Disposal	240	0	240	0
SR- 68-LA	WM Non-Radioactive Hazardous Waste Manageme	9,100	0	9,100	9,612
SR- 69-LA	WM Transuranic (TRU) Waste Facility	5,500	0	5,500	12,000
SR- 70-AA	WM Hazardous Waste/Mixed Waste Facility Sup	0	0	0	5,299
SR- 70-LA	WM Hazardous Waste/Mixed Waste Disposal Fac	4,330	0	4,330	10,330
SR- 71-LA	WM Hazardous Waste/Mixed Waste Disposal Fac	0	0	0	0
SR- 73-LA	WM Diversion Box/Pump Pit Containment Build	4,697	1,904	4,697	3,886
SR- 81-AA	SRL Consolidated Incineration Support	1,236	1,000	1,236	1,000
SR- 107-LA	WM Document Control Facility (LI)	0	0	0	0
SR- 109-AA	WM Sanitary Treatment Facility	0	4,158	0	4,158
SR- 109-LA	WM Sanitary Treatment Facility (LI)	0	0	0	0
SR- 110-AA	WM Auxilliary Control System	0	0	0	0
SR- 110-LA	WM Auxilliary Control System (LI)	0	0	0	0
SR- 111-AB	WM ITP Benzene Abatement	128	300	128	427
SR- 111-LA	WM ITP Benzene Abatement (LI)	0	0	0	0
SR- 112-AA	WM ITP Ion Exchange (LI)	484	352	484	700
SR- 112-LA	WM ITP Ion Exhange (LI)	0	0	0	0
SR- 125-CA	WM Tank Farm Operations - H-Area	1,549	2,865	1,549	6,517
SR- 125-GA	WM Tank Farm Operations - H-Area	1,640	1,269	1,640	2,932
SR- 126-CA	WM Tank Farm Opertions - F-Area	562	859	562	1,434
SR- 126-GA	WM Tank Farm Operations - F-Area	1,000	825	1,000	1,499
SR- 127-CA	WM In-Tank Precipitation/Extended Sludge Pr	0	0	0	652

ACTIVITY DATA SHEETS
SORTED BY FIELD OFFICE, INSTALLATION, AND CATEGORY
(dollars in thousands)

ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
SR- 127-GA	WM In-Tank Precipitation/Extended Sludge Pr	0	0	0	130
SR- 128-CA	WM Effluent Treatment Facility	1,519	2,149	1,519	4,562
SR- 128-GA	WM Effluent Treatment Facility	650	951	650	977
SR- 129-CA	WM Solid Waste Disposal Facilities	120	0	120	4,250
SR- 129-GA	WM Solid Waste Disposal Facilities	800	1,566	800	3,180
SR- 132-AA	RX REST-REPLACE UNDERGROUND FUEL OIL STORAGE	0	0	0	0
SR- 135-AA	E&PD-POWER Upgrade Softener Building and Spi	567	0	567	0
SR- 141-AA	RM New Degreaser System	0	0	0	0
SR- 145-AA	RM Upgrade Storm Sewer	0	0	0	0
SR- 147-AA	RM PROCESS SEWER	370	950	370	950
SR- 150-AA	SEP-Improved UO3 Containment	300	0	300	0
SR- 151-AA	SEP- F Canyon Outside Facilities Upgrades	200	0	200	0
SR- 152-AA	SEP-FB-Line Glovebox Waste Processing Facili	400	0	400	0
SR- 154-AA	SEP-Improve 221-F Segregated Water Monitorin	200	0	200	300
SR- 161-AA	RM-313-M COMPACTOR	0	123	0	123
SR- 162-AA	Liquid Effluent Treatment Facility (LETF)	0	9,318	0	9,318
SR- 165-AA	Waste Characterization /Production Support L	0	0	0	10,000
SR- 189-AA	SRL Support for Effluent Treatment Faciliti	1,000	1,200	1,000	1,200
SR- 200-AA	SRL Laboratory Process Sewer Upgrade	0	0	0	0
SR- 203-AA	SRL Sanitary Sewer Upgrade, T-Area	150	200	150	200
SR- 212-AA	WM Groundwater Monitoring	778	246	778	246
SR- 215-AA	WM New Sanitary Landfill - Design Support	0	64	0	50
SR- 215-LA	WM New Sanitary Landfill	0	0	0	5,200
SR- 217-LA	WM Waste Preparation Facility	0	0	0	0
SR- 237-AA	SRL Effluent Treatment Expansion, T-Area	0	0	0	0
SR- 242-AA	SRL Process Sewer Upgrade	210	200	210	200
SR- 411-AA	E&PD-Power Sanitary Sludge Land Reclamation	100	100	100	100
SR- 436-AA	SRL Replace Shielded Storage Exhaust System	0	0	0	0
SR- 440-AA	SRL Replace 735-A Low Activity Drain System	0	0	0	0
SR- 442-AA	SRL Z-Area Saltstone	800	800	800	800
SR- 449-AA	SRL Prepare Part B Permit	0	0	0	0
SR- 464-AA	SRL Contaiminent Characterization & Evaluat	400	400	400	400
SR- 475-AA	SRL Pressurize 904-A Trench	100	100	100	100
SR- 481-AA	WM Evaporator Containment - Design Support	0	75	0	0
SR- 481-LA	WM Evaporator Containment	0	0	0	0
SR- 482-AA	WM Sanitary Landfill Operations	4,412	8,343	4,412	5,000
SR- 483-AA	WM Waste Minimization	715	1,926	715	1,926
SR- 484-AA	WM Additional Waste Tank Cooling	0	0	0	0
SR- 484-LB	WM Fire Protection, Phase 6, for Waste Mana	0	0	0	0
SR- 507-AC	DWPF Vitrification Pre-op/Operations	1,000	0	1,000	2,390
SR- 507-AD	DWPF Defense Waste Processing Facility Labo	0	0	0	0
SR- 513-AB	DWPF Glass Waste Storage Building (GSWB)	0	0	0	0
SR- 513-AC	DWPF Failed Equipment Storage Vaults (FESV	0	0	0	0
SR- 527-AA	SRL Mercury Disposal	150	0	150	0
SR- 528-AA	SRL Improved Automation of DWPF	500	0	500	600
SR- 529-AA	SRL Replace Section 'E' Process HVAC, 773-A	0	250	0	250
SR- 533-AA	SRL TRU Waste Processing Technology	2,500	3,000	2,500	3,000
SR- 535-AA	WM Waste Management Quality Support - DWPF	0	0	0	0
SR- 536-AA	Nuclear Materials Processing Division - Trai	4,800	2,900	4,800	6,300
SR- 550-AA	WM Improved Waste Transfer Lines - Design S	0	0	0	0
SR- 550-LA	WM Improved Transfer Lines	0	0	0	0
SR- 570-AA	DWPF Technical - Vitrification	12,293	15,636	12,293	18,758
SR- 571-AA	DWPF Technical - Saltstone - Z-Area	896	1,806	896	1,806
SR- 572-AA	DWPF Technical - Saltstone - Y-Area	2,550	0	2,550	7,158
SR- 573-AA	DWPF Works Engineering - Vitrification	24,838	30,839	24,838	35,527
SR- 574-AA	DWPF Works Engineering - Saltstone - Z-Are	1,875	2,385	1,875	2,385
SR- 575-AA	DWPF Works Engineering - Saltstone Y-Area	0	0	0	99
SR- 576-AA	DWPF Production - Vitrification	44,313	51,727	44,313	55,738
SR- 577-AA	DWPF Production - Saltstone Z-Area	11,463	18,591	11,463	18,591
SR- 578-AA	DWPF Production - Saltstone - Y-Area	0	0	0	531
SR- 579-AA	DWPF Human Asset & Development & Site Servic	11,706	12,218	11,706	12,765
SR- 580-AA	DWPF Human Asset & Development & Site Servi	1,449	1,459	1,449	1,459
SR- 581-AA	DWPF Human Asset & Development & Site Servic	0	0	0	1,507

ACTIVITY DATA SHEETS
SORTED BY FIELD OFFICE, INSTALLATION, AND CATEGORY
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ADS No.	Activity Title	Validated Target Level FY 92	Validated Target Level FY 93	Preliminary Unvalidated Case FY 92	Preliminary Unvalidated Case FY 93
SR-582-AA	DWPF Startup - Vitrification	5,584	6,071	5,584	6,071
SR-583-AA	DWPF Quality - Vitrification	0	3,329	0	3,329
SR-584-AA	DWPF Quality Saltstone - Z-Area	0	160	0	160
SR-585-AA	DWPF Quality Assurance Saltstone - Y-Area	0	0	0	0
SR-586-AA	DWPF Program Assurance - Vitrification	1,201	649	1,201	649
SR-587-AA	DWPF Program Assurance Saltstone - Z-Area	110	104	110	104
SR-588-AA	DWPF Program Assurance Saltstone - Y-Area	0	0	0	0
SR-589-AA	DWPF Management Integration - Vitrification	40,620	704	40,620	782
SR-590-AA	DWPF Management Integration Saltstone - Z	105	99	105	99
SR-591-AA	DWPF Management Integration Saltstone - Y	0	0	0	0
SR-609-AA	SRL Technical Support for SRS Waste Managem	700	700	700	700
SR-620-AC	DWPF Saltstone Operations - Z-Area	500	0	500	800
SR-631-AB	DWPF Vitrification Preop/Operations	4,850	0	4,850	22,587
SR-632-AB	DWPF Saltstone Operations - Z-Area	500	0	500	500
SR-641-AC	DWPF M-Area Waste Disposal (Y-Area)	4,170	4,113	4,170	11,450
SR-642-AC	DWPF Ion Exchange Process	0	0	0	0
SR-643-AC	DWPF Salt Cell Benzene Abatement	0	0	0	0
SR-644-AC	DWPF Sludge Receipt & Adjustment Tank H2 De	0	0	0	0
SR-645-AC	DWPF - LOW/HIGH LEVEL INTERIM WASTE STORAGE	0	0	0	0
Subtotal SR, SAVANNAH RIVER SITE, WM		491,325	502,301	491,325	722,362
Subtotal SR, SAVANNAH RIVER SITE		546,585	547,361	546,585	799,009
Subtotal SR		546,585	547,361	546,585	799,009
Grand Total		4,379,342	4,882,060	4,379,342	6,932,841

APPENDIX G

OFFICE OF TECHNOLOGY ASSESSMENT

CROSS REFERENCES

Office of Technology Assessment *Complex Cleanup*
Department of Energy Five-Year Plan
Cross-References

OTA Page	FYP Section	OTA Text
4	1.1 1.2.1 1.2.2 1.3.4 1.3.4.1 1.3.4.2 1.3.4.3 1.4.3	DOE has prepared a Five-Year Plan that describes its goals, strategies, and specific programs for assessment and cleanup of contaminated sites and facilities to meet standards prescribed in Federal and State laws. The first Five-Year Plan was issued in 1989 and covered FY 1991-1995. The Five-Year Plan issued in 1990 updates the 1989 Plan and covers FY 1992-1996. The 1990 Five-Year Plan calls for expenditures totaling more than $30 billion on environmental restoration and waste management activities for FY 1992-1996, but most believe that this represents only the discovery phase of a program that could require hundreds of billions of dollars to complete.
23	1.1 1.2.1 1.2.3 1.4.1 1.4.7	The public is only vaguely aware of the nature and extent of the waste and contamination problems at the DOE Nuclear Weapons Complex. In addition, the government's goals for cleanup of contaminated sites and safe management of radioactive and hazardous waste are defined in very broad, general terms. DOE is attempting to clarify this situation through its 5-year planning process and its activities in waste management and environmental characterization at thousands of contaminated sites throughout the Weapons Complex.
23	1.1 1.2.1 1.3.4 1.3.5	The Nuclear Weapons Complex is a collection of enormous factories devoted to metal fabrication, chemical separation processes, and electronic assembly. Like most industrial operations, these factories have generated waste, much of it toxic. Forty-five years of nuclear weapons production have resulted in the release of vast quantities of hazardous chemicals and radionuclides to the environment. Evidence exists that air, groundwater, surface water, sediments, and soil, as well as vegetation and wildlife, have been contaminated at most, if not all, nuclear weapons sites.
23	1.2.1 1.3.5	Contamination of soil, sediments, surface water, and groundwater throughout the Weapons Complex is widespread.
23	1.3.3	Substantial quantities of radioactive and mixed waste have been buried throughout the complex, many without adequate record of their location or composition. DOE has estimated that buried transuranic waste totals about 0.2 million m^3 and buried low-level radioactive waste, 2.5 million m^3.
26	1.2.1 1.2.5 1.3 1.4.7	DOE has begun to face the enormous task of environmental restoration at sites within the Weapons Complex. Plans addressing the size, scope, time, and resources required have been developed only recently. The DOE Five-Year Plan describes its goals, strategies, and specific programs for assessment and cleanup of contaminated sites and facilities to meet standards prescribed in Federal and State laws.
26	1.1 1.2.1 1.2.3	In the 1990 Five-Year Plan, DOE states that it is committed to the goal of environmental cleanup at all weapons sites by the year 2019 and that the public must be involved in the process.
26	1.1 1.2.1 1.2.3	According to the DOE, "the 30-year goal for environmental restoration is to ensure that risks to the environment and to human health and safety posed by inactive and surplus facilities and sites are either eliminated or reduced to prescribed, safe levels."

Note: Most FY 1993-1997 Five-Year Plan Section references are from Section 1. Additional references may be found in Sections 2 and 3.

OTA Page	FYP Section	OTA Text
26	1.4.4.3	DOE has also stated that "in certain instances" in situ stabilization and disposal may be the alternative selected. According to DOE, this will depend on: "1) specific site conditions; 2) the type, nature, extent, and amount of contaminants present; 3) availability of suitable cleanup technologies; 4) regulatory factors; or 5) other agreed to (with regulators) considerations."
33	1.1 1.4.5	DOE's Five-Year Plan for environmental restoration is devoted mainly to describing work to be done pursuant to RCRA or CERCLA.
37	1.4.4.3	The 1989 Five-Year Plan states that DOE will "contain known contamination at inactive sites and vigorously assess the uncertain nature and extent of contamination at other sites to enable realistic planning, scheduling and budgeting for cleanup."
37	1.1 1.2.4 1.2.4.1 1.2.4.2 1.2.4.3 1.3 1.4	Although DOE has set a 30-year cleanup goal, it has not prepared a long-range planning document with cost estimates to meet that goal. The absence of a budgeted plan can make the attainment of any goals difficult to achieve. Not since 1988, when DOE prepared a "needs assessment" report that attempted to describe environmental restoration requirements over a 20-year period, has this long-range view been addressed. Over 20 years, some projects could be planned to completion. The current DOE approach was initiated with the 1989 Five-Year Plan, which does not project beyond its limited time frame. Within that period, no DOE projects can be planned to completion.
40	1.2.3 1.3 1.3.4.2 1.4.6.3	DOE is now emphasizing the development of new technologies that may be more effective, be less costly, and go farther toward actual destruction of some contaminants.
42	1.2.4 1.2.4.1	In the 1990 Five-Year Plan, almost two-thirds of current and future funding is devoted to waste operations.
43	1.3.2 1.3.3	The 1990 Five-Year Plan discusses DOE programs for managing the waste at the Weapons Complex and reflects the recent reorganization of DOE waste management activities. Programs for treating, storing, and disposing of the weapons waste are now the province of the Office of Waste Operations, one of three subdivisions of EM.
50	1.3.4.3 1.3.5 1.3.6.3 1.4.4.3 1.4.7	DOE's current program for managing stored transuranic (TRU) waste contemplates the construction of six new facilities at various sites during 1992-1999 for processing, treating, and certifying TRU waste prior to shipment to the Waste Isolation Pilot Plant (WIPP).
50	1.2.1 1.2.5 1.3.4	DOE's plan for disposing of retrievably stored TRU waste depends on the availability of WIPP as the disposal facility. However, the opening of WIPP for preliminary tests was delayed from the initially projected date of October 19, 1988, and more recently projected opening dates have also not been met. Before making a decision to store TRU waste at WIPP on a permanent basis, DOE plans to conduct tests for about 5 years, in accordance with its plan for the WIPP Test Phase.

Note: Most FY 1993-1997 Five-Year Plan Section references are from Section 1. Additional references may be found in Sections 2 and 3.

OTA Page	FYP Section	OTA Text
50	1.2.1 1.2.5 1.3.4 1.4.7	After experimental emplacement in WIPP of a limited number of TRU-filled bins, tests would be conducted to evaluate the potential problem of gas generation in the waste package. . . . Furthermore there is little in the 1990 Five-Year Plan to indicate how DOE will deal with the implications of this longer interim storage at the six principal sites other than Rocky Flats, where transuranic waste is now stored.
52	1.2.5	For example, DOE currently assumes that the earliest possible time at which an HLW repository at Yucca Mountain could be available for shipment of defense high-level waste is the year 2015. Given that situation, any vitrified high-level waste must remain onsite longer than originally anticipated. The public has not been explicitly notified of the possible onsite storage of vitrified high-level waste for the next two to five decades, and DOE has not focused adequate attention on the waste testing and monitoring that may be required. DOE has, however, noted that "interim storage after conversion will be required until the repository is opened."
52	1.2.5	Most DOE plans for dealing with HLW and TRU assume that a deep geologic repository will be available for disposal of each type of waste at some specified time in the future. Until very recently--in fact, just prior to preparation of the 1989 Five-Year Plan--DOE's disposal strategy for HLW and TRU waste was based on the assumption that a repository for HLW would be available by the year 2003, and a research and development facility for disposal of TRU by 1988, followed soon after by an operational repository. DOE's projections have changed significantly, but its planning with regard to interim storage has not kept pace with the changing scenarios of geologic repository availability. DOE has recently focused more attention on the interim storage that will be required until the HLW and spent fuel repository is opened, which has now been delayed at least 7 years until 2010. The interim storage period continues to grow as both repositories continue to be delayed.
53	1.4.7	There appears to be only one site--Rocky Flats Office--for which DOE has begun to plan alternative storage approaches for TRU waste. However, at least one of those approaches--storing Rocky Flats waste at other DOE sites--has been opposed by the Governors of affected States. The other two approaches--commercialization of disposal and use of Defense Department sites--will raise regulatory, political, and other questions. Furthermore, there is little in the 1990 Five-Year Plan to indicate how DOE will deal with the implications of this longer interim storage at the six principal sites other than Rocky Flats, where TRU waste is now stored.
55	1.2.4 1.2.4.1 1.4.6 1.4.6.1	Funding requests for the President's budget are lower than the costs estimated in the 1990 Five-Year Plan. DOE has stated that the levels of funding implied by the latest cost estimate "cannot now be managed responsibly and effectively, given the inadequacy of the DOE, contractor, industry and regulatory infrastructure."

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OTA Page	FYP Section	OTA Text
55	1.2.4.1	The most recent DOE cost estimates can be found in the 1990 Five-Year Plan in which DOE presents budget costs for FY 1990 and 1991 and planning estimates for the following 5 years (FY 1992-1996). This plan covers only those activities that may be accomplished during that time. As described elsewhere in this report, work planned for the next 5 years is devoted primarily to characterizing contaminated environments, stabilizing some inactive sites at which standard techniques can be applied, and continuing to manage the large quantity of waste within each site. These latest estimates exceed the estimates contained in the 1989 Five-Year Plan by a substantial amount. (The illustration shows 1989 vs. 1990 $'s.)
57	1.2.4 1.2.4.1 1.3.6.1 1.3.6.2 1.3.6.3	DOE's current cost estimates contained in the 1990 Five-Year Plan are generally divided into four major categories: 1) waste management, 2) environmental restoration, 3) technological development, and 4) corrective activities. . . . DOE has allocated about 90 percent of the funds for waste management and environmental restoration, with about twice as much for the former as for the latter. Over the 7 years covered in the plan, these two categories are expected to grow from 86 to 93 percent of the budget. The remainder is allocated to corrective activities and technological development. . . . A major factor influencing the dominant cost allocation to waste management in the Five-Year Plan is the number of large, new, and costly technologies being implemented over this time. In addition, serious problems with storage and treatment of certain waste must be resolved. It is therefore understandable that waste management is given high priority in the budget plan. This heavy emphasis on one category, however, will require continued scrutiny as environmental restoration decisions begin to be made a few years hence and more funds are required. If waste continues to be generated, it may be more prudent to allocate resources to solve existing contamination problems first and then to focus on minimizing future waste generation.
57	1.2.4 1.2.4.1 1.2.4.3 1.4.6.1 1.4.6.2 1.4.6.3	Although the DOE Five-Year Plan is a good approach to planning budget allocations in the near term, most of the current environmental restoration costs are for studies and assessment to characterize the problem, not for remediation activities. OTA analysis indicates that recent estimates of the cost of cleanup projects are unreliable in many areas and are inconsistent throughout the NWC. . . .
58	1.2.4.1	See the OTA Report for Figure 2-8, DOE Budget for EM
59	1.2.4 1.2.4.1 1.2.4.2 1.4.6.1 1.4.6.2 1.4.6.4	It is evident from the OTA's analysis that these DOE cost estimates are inconsistent and difficult to compare. . . . In addition, DOE project engineers have indicated that they were given too little time to accurately estimate environmental remediation costs in the preparation of both Five-Year Plans. Steps are being taken by both DOE and its prime contractors to understand and address these inconsistencies.

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OTA Page	FYP Section	OTA Text
59	1.4.6.1 1.4.6.2 1.4.6.3 1.4.6.4	DOE has begun to analyze cost uncertainties associated with environmental restoration projects, and its study shows that as a project becomes more defined, estimates become more accurate. . . According to this analysis, a cost increase of more than 25 percent is not uncommon for environmental restoration projects because of the complexity of the waste, the variability of the sites, and the level of sophistication of the technology used. This information is being used to help DOE cost estimators on environmental restoration projects, along with a cost estimating handbook developed by DOE. These tools were not used to estimate the costs for the 1990 Five-Year Plan, however.
60	1.2.4 1.4.6.1 1.4.6.2 1.4.6.3 1.4.6.4	In the 1990 Five-Year Plan, a DOE-wide four-level priority system is set forth for allocating funds to environmental restoration and waste management activities. The categories encompass the following types of activities: 1. those necessary to prevent near-term adverse impacts on workers, the public, or the environment, including containment to prevent the spread of contamination and waste management activities to maintain safe conditions (also included in this category is the continuation of ongoing activities that, if terminated, could have significant negative effects); 2. those necessary to meet the terms of agreements between DOE and local, State, or Federal agencies; 3. all other activities required to reduce risks, promote compliance, reduce public concern, and maintain DOE missions; and 4. activities with no pressing time constraints, such as decontamination or decommissioning. In practice, most activities fall into priority 1 or 2. Because priority 2 includes milestones set by all the interagency agreements that have been signed, it would be difficult for DOE not to assign these activities top priority.
60	1.2.4 1.4.6.1 1.4.6.2 1.4.6.3 1.4.6.4	At the same time, DOE headquarters has been developing a separate "risk-based" priority system to help DOE "make budget decisions about how much funding to request for cleanup activities and how to allocate the funds that are made available". . . . According to DOE, the "precise relationship of the steps in the priority system to the Five-Year Plan and the overall budget process is still evolving." DOE has stated its intent to develop this method, which it contends is a "rigorous, risk-based prioritization methodology for application starting in FY 1992."
62	1.4.6.2	One other alternative [to prioritization schemes] discussed in the Five-Year Plan is "to develop a ranking based on direct health, environmental, and regulatory risk."
62	1.4.6.1 1.4.6.2 1.4.6.4	DOE's various priority systems have certain fundamental flaws and have yet to prove themselves useful in decision making. The priority scheme used in the 1990 Five-Year Plan groups activities into four very broad categories. Most DOE activities fall into some portion of the first two categories. . . . However, the scheme provides little or no guidance for ranking activities within those major categories (or indeed any category). In apparent recognition of this problem, DOE states that it is considering several different approaches to the priority system such as breaking down categories into sublevels.

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OTA Page	FYP Section	OTA Text
62	1.3.6.4 1.4.6.2	A different limitation pertains to priority 2- . . . As noted in the 1990 plan, these agreements "represent legal commitments to complete activities on the schedules agreed to by DOE."
62	1.3.6.4 1.4.6.2	In the 1990 Five-Year Plan, DOE's description of its new quantitative priority system and computer model states that reducing "health risk impact is of primary importance: and that "public health risk reduction and environmental protection" are "two factors of primary concern" in evaluating the utility of activities or projects. Yet, at present, the greatest uncertainty concerns the variables that should be given highest priority in these systems--reducing health and environmental risks.
64	1.1 1.1.1 1.3.4 1.3.6.5 1.4.1 1.4.3 1.4.3.1 1.4.4.1	The foreword to the 1990 Five-Year Plan states that "through openness and cooperation, DOE hopes to make its environmental program more responsive to public concern. In the 1989 Five-Year Plan, DOE outlined its public involvement efforts, which were directed primarily toward obtaining review and comments in connection with the plan. During development of the 1989 plan and after its publication, DOE invited input from the State and Tribal Government Working Group, which included representatives chosen by the Governors of 10 states, leaders of 2 Indian Nations, and representatives from the National Governors' Association, the National Association of Attorneys General, and the National Conference of State Legislators.
64	1.4.3.1 App. C App. E	DOE's responses to the comments are included in an appendix to the 1990 Five-Year Plan.
64	1.1 1.1.1 1.3.4 1.3.6.5 1.4.1 1.4.3 1.4.3.1 1.4.4.1	In response to a comment on the 1989 Five-Year Plan inquiring how State, Tribal, and public participation will be implemented (and, specifically, what DOE means by public participation--whether groups will participate in the preparation of Activity Data Sheets submitted by the facilities, whether public hearings will be held, etc.), DOE noted that the "commitment to participation by States, Tribes, and the public is 'new culture' for DOE"; thus details for accomplishing this will continue to evolve. DOE also noted that public hearings on the Five-Year Plan were not anticipated, but it specified other avenues for public participation: . . .
64	1.4.3 1.4.3.1	The 1989 Five-Year Plan also called for public involvement in DOE's implementation of the plan at the operations office level. It states that affected parties should participate in the development and review of site-specific implementation plans. The 1990 plan does not indicate that this has come to pass. . . . it mentions local involvement only as something that is yet to come.
64	1.4.3 1.4.3.1	"Beginning with the Plan, DOE will extend formal involvement to local communities near its facilities and sites. The mechanism for expanded public participation will be public participation plans for DOE's major installations, to be specified by Operation Offices in their Site-Specific Plan."
65	1.4.4.3	In January 1990, Secretary Watkins announced that DOE will prepare a PEIS for the Five-Year Plan and will hold public meetings to obtain comments on the scope and content of that Environmental Impact Statement.

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OTA Page	FYP Section	OTA Text
65	1.4.4.1	DOE anticipates more public involvement in the site-specific plans in the future.
65	1.3.6.4 1.4.6.2	A final area in which DOE proposes to involve the public in the development of a priority system for the Weapons Complex. This system, described above, will serve as a replacement for the Program Optimization System--DOE's first quantitative priority-setting effort for environmental restoration. According to the 1990 Five-Year Plan, "since last October, the External Review Group . . . has participated in the design of a rigorous, risk-based methodology for prioritizing remedial activities."
67	1.4.1 1.4.3 1.4.3.1	Another person cited the Stakeholders Forum to discuss the predecisional draft of the 1990 Five-Year Plan as a meeting that went well. However, he was not wholly satisfied, because, in his opinion, the meeting occurred too late to make any real difference in the plan.
67	1.2.4 1.2.4.1 1.2.4.2 1.2.4.3 1.3.4.2 1.3.6.2 1.4.6.3 1.4.6.4	The 1990 Five-Year Plan also calls for technological development spending related to site cleanup and waste management to increase from about $200 million in FY 1991 to $360 million by FY 1994-1996. This represents 5 to 8 percent of the total cleanup budget projected for these years (8 percent currently, decreasing to 5 percent in 1995 and 1996). A new national program has been created for research and development; the organizational framework for such a program emerged in 1990 in the form of the new DOE OTD. This program builds on past DOE Research & Development efforts including HAZWRAP.
67	1.2.4 1.2.4.1 1.2.4.2 1.2.4.3 1.3.4.2 1.3.6.2 1.4.6.3 1.4.6.4	DOE states in the 1990 Five-Year Plan that major research initiatives will focus on 1) waste minimization, 2) improved waste operations to prevent the need for future site cleanup, and 3) environmental restoration to remedy past contamination. In addition, DOE intends to support major initiatives in education, training, and technology transfer. The 5-year budget allocates about 39 percent of technology funding for environmental restoration, 23 percent for waste operations, 10 percent for education, 13 percent for technical support, and 15 percent for program support (administration). Through this technological development program, DOE plans to make new, improved, and innovative technologies available for the most difficult environmental restoration and waste management problems.
67	1.2.4.2 1.2.4.3 1.3.4.2 1.3.6.2 1.3.6.5.2	The 1990 DOE plan proposes to increase funding; foster greater cooperation among national laboratories; implement a process for identifying the best technologies; develop a rigorous, consensus-based prioritization methodology for research and development activities, with public participation; promote specific technologies for specific purposes; and implement new educational initiatives. DOE intends to support new university consortia and degrees relevant to its needs, as well as proposals encouraging students to specialize in vital areas. These actions in education respond to DOE's concern about a shortage of skilled personnel in areas required for cleanup.

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OTA Page	FYP Section	OTA Text
67	1.2.4.2 1.3.4.2 1.3.6.2 1.4.6.3	DOE intends to develop and utilize new technologies in its environmental restoration and waste management effort. The motivation for doing so is twofold: first, in many instances, technologies to accomplish certain cleanup and waste management tasks are either nonexistent or ineffective; second, implementation of new technologies is said to be able to significantly reduce future expenditures, especially with in situ treatment. These and other factors led DOE to state that "to successfully achieve its 30-year cleanup goal and to do this with the lowest possible cost, DOE must create and rapidly field new technologies concordant with all applicable regulations."
68	1.3.4.2 1.3.6.2 1.4.6.3	The new Office of Technology Development . . . . DOE expects a major return from its investment of about $1 billion in technological development over the next 5 years.
71	1.2.4.2 1.2.4.3 1.3.4.2 1.3.6.2 1.3.6.5.2	In the 1990 Five-Year Plan, DOE points out that environmental restoration and waste management activities require a relatively high level of expertise and that skilled professionals are in short supply. . . . DOE intends to implement new and expanded educational support programs focused on helping meet its critical personnel requirements for the future. . . .DOE's plan calls for an expansion of innovative outreach programs to minorities and to the educationally disadvantaged.
72	1.3.6.1	DOE has emphasized the role of waste minimization in several of its planning documents for defense waste management and environmental restoration. For example, in the 1989 Five-Year Plan, DOE stated that it will focus resources on three major classes of activity, one of which is to "...continue safe and effective waste management operations but emphasize systematic minimization of waste generation."
72	1.3.6.1	Preliminary DOE estimates indicate that waste minimization could result in a significant reduction of waste treatment, storage, and disposal costs, as well as a reduction in worker exposure and public risk. According to DOE, waste minimization will affect all present and proposed DOE operations and the agency is now moving to a more formal program from an ad hoc approach in the past.
72	1.2.4.2	DOE's budget in the 1990 Five-Year Plan for education and outreach is about $21 million in FY 1991, increasing to $37 million by FY 1994.
72	1.3.6.1	DOE has emphasized the role of waste minimization in several of its planning documents for defense waste management and environmental restoration. For example, in the 1989 Five-Year Plan, DOE stated that it will focus resources on three major classes of activity, one of which is to "...continue safe and effective waste management operations but emphasize systematic minimization of waste generation."
79	1.4.4.3	". . . the potential exists for current or future exposure of humans to toxic materials."
80	N/A	Radioactive cesium released from the Oak Ridge Reservation has been found in the sediment of a Tennessee Valley reservoir used for recreation and fishing.
80	N/A	At some sites, pollution is migrating in ways that make public contact probable unless action is taken. For example, at the Feed Materials Production Center in Fernald, OH, contaminated groundwater plumes have extended offsite . . ."

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OTA Page	FYP Section	OTA Text
132	N/A	1. Strengthen the Personnel of Involved Agencies to Conduct Waste Management and Environmental Restoration Programs: DOE has begun to address contamination problems due to past releases of waste at Weapons Complex sites. Activities to date include restructuring relevant parts of the Department, preparing a Five-Year Plan that includes environmental restoration and technological development programs, and negotiating agreements with EPA and the relevant States pursuant to regulatory requirements under the RCRA and CERCLA. However, actual characterization of sites is just beginning, and hardly any remediation has been accomplished.
132	N/A	A major problem highlighted by DOE in the 1990 Five-Year Plan is a serious shortage of qualified personnel in DOE, EPA, and other involved Federal and State agencies required to manage and carry out waste management and environmental restoration programs.
198-202	1.2.4.1 1.4.6.1 1.4.6.2 1.4.6.3 1.4.6.4	Overview of the DOE Cost Estimation Process describes how DOE conducts cost estimations, presents current efforts to standardize ER cost estimation practices, and discusses potential savings from R&D. While this section is not a criticism, per se, it points out weaknesses in cost estimating practices, policies, and procedures.

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APPENDIX H

ACRONYMS AND INITIALISMS

ACRONYMS AND INITIALISMS

ACHD	Alameda County Health Department
ACO	Administrative Consent Order
ADS	Activity Data Sheet
AEA	Atomic Energy Act
AEC	Atomic Energy Commission
AFB	Air Force Base
AIP	Agreement-in-Principle
AL	Albuquerque Field Office
ALARA	as low as reasonably achievable
ANL-E	Argonne National Laboratory-East (Chicago)
ANL-W	Argonne National Laboratory-West (at INEL)
ANSI	American National Standards Institute
APs	Activity Packages
APEN	Air Pollution Emission Notices
ARARs	Applicable or Relevant and Appropriate Requirements
ASHE	Assistant Secretary for Environment, Safety and Health
ASTM	American Society of Testing and Materials
ATMS	Automated Transportation Management System
BAAQMD	Bay Area Air Quality Management District
BBC	balanced biological communities
BCBG	Bear Creek Burial Ground
BCL	Battelle Columbus Laboratories
BDAT	best demonstrated available technology
BG	burial ground
BNL	Brookhaven National Laboratory
BORAX	Boiling Water Reactor Experiment
CAs	Corrective Activities
CAA	Clean Air Act
CAT	Collection and Transfer
CDC	Center for Disease Control
CDH	Colorado Department of Health
CDR	Conceptual Design Report
CEARP	Comprehensive Environmental Assessment and Response Program
CEDR	Comprehensive Epidemiologic Data Resource
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CH	Chicago Field Office
CH	contact handled
CIF	Consolidated Incinerator Facility
CMS	RCRA Corrective Measures Study
CNF	Central Neutralization Facility

COCA	Consent Order and Compliance Agreement
COCO	Contractor-Owned Contractor-Operated
CPAF	Cost Plus Award Fee
CWA	Clean Water Act
CY	Calendar Year
CYWP	Current Year Work Plans
D&D	decontamination and decommissioning
DFDP	Defense Facility Decommissioning Program
DHS	(California) Department of Health Services
DOD	Department of Defense
DOE	Department of Energy
DOI	Department of Interior
DOJ	Department of Justice
DOT	Department of Transportation
DP	Defense Programs
DST	double-shell tank
DT&E	Demonstration, Testing, and Evaluation
DUOF	Depleted Uranium Oxide Facility
DWMP	Defense Waste Management Plan
DWPF	Defense Waste Processing Facility
DWTF	Decontamination and Waste Treatment Facility
E-MAD	Engine Maintenance Assembly and Disassembly
EA	environmental assessment
EBMUD	East Bay Municipal Utilities District
EBWR	Experimental Boiling Water Reactor
EFPC	East Fork Poplar Creek
EIP	Emission Inventory Plan
EIS	Environmental Impact Statement
EM	Office of Environmental Restoration and Waste Management
EnviroTRADE	Environmental Technologies for Remedial Action Data Exchange
EOD	Explosives Ordnance Disposal
EPA	Environmental Protection Agency
ER	Environmental Restoration
ERG	External Review Group
ERDA	Energy Research and Development Administration
ESAAP	Energy System Acquisition Advisory Board
ES&H	Environment, Safety, and Health
ESP	Extended Sludge Processing
ETEC	Energy Technology Engineering Center (Canoga Park)
F&OR	Functional and Operational Requirements
FDER	Florida Department of Environmental Regulation
FERMILAB	FERMI National Accelerator Laboratory
FEMP	Facility Effluent Monitoring Plan

FFA	Federal Facilities Agreement
FFCA	Federal Facility Compliance Agreement
FIDS	Fernald Integrated Demonstration Site
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FMPC	Feed Materials Production Center (Fernald)
FONSI	Finding of No Significant Impact
FOS	Fuel Oil Spill
FS	feasibility study
FSAR	Final Safety Analysis Report
FSFCA	Federal State Facilities Compliance Agreement
FUSRAP	Formerly Utilized Sites Remedial Action Program
FY	fiscal year
FYP	Five-Year Plan
GCD	greater confinement disposal
GE	General Electric
GJPO	Grand Junction Projects Office (Grand Junction)
GOCO	Government-Owned Contractor-Operated
GPCS	Gas Purification control system
GPP	General Plant Project
GSA	General Services Area
GTCC	Greater Than Class C
GTF	Grout Treatment Facility
GWS	Groundwater and Soil Cleanup
HAP	Hazardous Air Pollutant
HBCU	Historically Black Colleges and Universities
HE	high explosive
HEPA	high-efficiency particulate air (filters)
HHS	Department of Health and Human Services
HLLW	high-level liquid waste
HLW	high-level waste
HM-181	Federal Register Notice, US DOT Volume 55 #246
HMTA	Hazardous Materials Transportation Act
HNPF	Hallam Nuclear Power Facility
HQ	Headquarters
HRS	Hazard Ranking System
HSWA	Hazardous and Solid Waste Amendments
HTRE	Heat Transfer Reactor Experiment
HW	Hazardous Waste
HWHF	Hazardous Waste Handling Facility
HWVP	Hanford Waste Vitrification Plant
IA	Interim Action
IAEA	International Atomic Energy Agency
IAG	Interagency Agreement

IBWP	Idaho National Engineering Laboratory Buried Waste Program
ICM	Interim Corrective Measures
ICPP	Idaho Chemical Processing Plant
ICR	Independent Cost Review
ID	Idaho Field Office
ID	Integrated Demonstration
IDB	Integrated Data Base
IDC	Integrated Demonstration Coordinator
INEL	Idaho National Engineering Laboratory
IP	Impelementation Plan
IRB	Internal Review Budget
IRTS	Integrated Radwaste Treatment System
ISV	in situ vitrification
ITE	Integrated Technology Exchange
ITP	In-Tank Precipitation
ITRI	Inhalation Toxicology Research Institute (Albuquerque)
IWPF	Idaho Waste Processing Facility
K-25 Site	Oak Ridge K-25 Site
KCP	Kansas City Plant
KPDES	Kentucky Pollutant Discharge Elimination System
LANL	Los Alamos National Laboratory
LBL	Lawrence Berkeley Laboratory
LDR	land disposal restrictions
LDU	land disposal units
LECS	liquid effluent containment system
LEHR	Laboratory for Energy-Related Health Research
LET&D	liquid effluent treatment and disposal
LIP	Line Item Project
LLLW	liquid low-level waste
LLNL	Lawrence Livermore National Laboratory
LLW	low-level waste
LLWDDD	Low-Level Waste Disposal Development Demonstration
LLWDF	Low-Level Waste Disposal Facilities
LUFT	Loss of Fluid Tests
M&O	Management and Operating
MACT	Maximum Achievable Control Technology
MAD	Maintenance Assembly and Disassembly
MCL	Maximum Contaminant Level
MCS	Monitoring Control System
MDNR	Missouri Department of Natural Resources
MED	Manhattan Energy District
MI	Minority Institution
MLLWDF	Mixed Low-Level Waste Disposal Facility

MLLWTF	Mixed Low-Level Waste Treatment Facility
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MTR	Materials Test Reactor
MW	mixed waste
MWMF	Mixed Waste Management Facility
NAC	Nevada Administrative Code
NAS	National Academy of Sciences
NBL-NJ	New Brunswick Laboratory - New Jersey
NCP	National Contingency Plan
NE	Nuclear Energy
NEPA	National Environmental Policy Act
NESHAPs	National Emission Standards for Hazardous Air Pollutants
NFS	Nuclear Fuel Services
NFSS	Niagara Falls Storage Site
NJDEP	New Jersey Department of Environmental Protection
NLF	Navy Landfill
NMEID	New Mexico Environmental Improvement Division
NMWQCCR	New Mexico Water Quality Control Commission Regulations
NOI	Notice of Intent
NOx	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NQA-1	Nuclear Quality Assurance - 1
NRC	Nuclear Regulatory Commission
NRDA	Natural Resource Damage Assessment
NRDC	Natural Resources Defense Council
NTS	Nevada Test Site
NV	Nevada Field Office
NWC	Nuclear Weapons Complex
NWCF	New Waste Calcining Facilities
NWPA	Nuclear Waste Policy Act
NYSDEC	New York State Department of Environmental Conservation
NYSERDA	New York State Energy Research and Development Administration
OCRWM	Office of Civilian Radioactive Waste Management
OECD	Organization for Economic Cooperative Development
OEMT	Operational Emergency Management Team
OER	Office of Environmental Restoration
OMA	Office of Military Applications
OMB	Office of Management and Budget
OR	Oak Ridge Field Office
ORAU	Oak Ridge Associated Universities
ORFTF	Oak Ridge Filter Test Facility
ORGDP	Oak Ridge Gaseous Diffusion Plant (now Oak Ridge K-25 Site)

ORNL	Oak Ridge National Laboratory
OSHA	Occupational Safety and Health Administration
OTA	Office of Technology Assessment
OTD	Office of Technology Development
OU	operable unit
PA	preliminary assessment
PATRAM	Packaging and Transportation of Radioactive Materials
PB&E	planning, budgeting, and execution
PCBs	polychlorinated biphenyls
PCE	perchloroethylene
PCO	Program Coordination Offices
PEIS	Programmatic Environmental Impact Statement
PFP	Plutonium Finishing Plant
PGDP	Paducah Gaseous Diffusion Plant (Paducah)
PNC	Power Reactor and Nuclear Fuel Corporation
PNPF	Piqua Nuclear Power Facility
PORTS	Portsmouth Gaseous Diffusion Plant (Portsmouth)
POTW	publicly owned treatment works
PREPP	Processing Experimental Pilot Plant
PRONTO-2D	Two-dimensional structural analysis code
PRONTO-3D	Three-dimensional structural analysis code
PRP	potentially responsible party
PSAR	Preliminary Safety Analysis Report
PSD	Prevention of Significant Deterioration
PSO	Program Secretarial Office
PUC	Preliminary Unvalidated Case
PWSF	Production Waste Storage Facility
PWTF	Production Waste Treatment Facility
QA	quality assurance
QC	quality control
R&D	research and development
RA	remedial action
RADTRAN	A computer code to analyze Radiological Risks of Transportation
RAP	remedial action program
RCB	Retrieval Containment Building
RCRA	Resource Conservation and Recovery Act
RD	remedial design
RD&D	Research, Development, and Demonstration
RDDT&E	Research, Development, Demonstration, Testing, and Evaluation
REA	Radiologic Engineering Assessment
RF	Rocky Flats Office
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation

RH	remote handled
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
RIR	Remedial Investigation Report
RL	Richland Field Office
RMDF	Radioactive Materials Disposal Facility
RMI	Reactive Metals, Inc.
RMW	Radioactive Mixed Waste
ROD	Record of Decision
RRI	RCRA Remedial Investigation
RSWF	Radioactive Scrap and Waste Facility
RWMC	Radioactive Waste Management Complex
RWMS	Radioactive Waste Management Site
RWQCB	Regional Water Quality Control Board
S&M	surveillance and maintenance
SAGSTRAM	Standing Advisory Group for Radioactive Material
SAN	San Francisco Field Office
SAR	Safety Analysis Report
SARA	Superfund Amendments and Reauthorization Act
SARP	Safety Analysis Report for Packaging
SCDHEC	South Carolina Department of Health and Environmental Control
SCTI	Sodium Components Test Installation
SDA	Subsurface Disposal Area
SDWA	Safe Drinking Water Act
SEIS	Supplemental Environmental Impact Statement
SFMP	Surplus Facilities Management Program
SI	site inspection
SJCAPCD	San Joaquin County Air Pollution Control District
SLAC	Stanford Linear Accelerator Center
SMS	Sludge Mobilization System
SNL	Sandia National Laboratories
SNLA	Sandia National Laboratories-Albuquerque
SNLL	Sandia National Laboratories-Livermore
SPCC	Spill Prevention Control and Countermeasures
SPEERA	Secretarial Panel for the Evaluation of Epidemiologic Research Activities
SPERT	Special Power Excursion Reactor Test
SPF	Sodium Process Facility
SR	Savannah River Field Office
SRS	Savannah River Site
SSFL	Santa Susana Field Laboratory
SSP	Site-Specific Plan
SST	single-shell tank
STGWG	State and Tribal Government Working Group
STP	sewage treatment plant
SW	sanitary waste

SWAT	Solid Waste Assessment Test
SWDA	Solid Waste Disposal Act
SWRB	Storm Water Retention Basin
SWSA	Solid Waste Storage Area
SWMU	solid waste management unit
TA	Technical Area
TAP	Technical and Advisory Panel
TAN	Test Area North
TCE	trichloroethylene
TD	Technology Development
TDHE	Tennessee Department of Health and Environment
TEPP	Transportation Emergency Preparedness Program
TMI	Three Mile Island
TMP	Transportation Management Program
TPA	Tri-Party Agreement
TPO	Technical Program Officer
TRA	Test Reactor Area
TRANSCOM	Transportation, Tracking and Communication System
TRANSNET	A Transportation Network consisting of computer, analysis codes, and data bases, some of which are inactive
TRL	Tritium Research Laboratory
TRU	transuranic
TRUPACT	Transuranic Package Transporter, a package to transport contact-handled transuranic waste
TSCA	Toxic Substances Control Act
TSD	treatment, storage, and disposal
TSDF	treatment, storage, and disposal facility
TTAF	Test Train Assembly Facility
TTO	Total Toxic Organics
TTP	Technical Task Plans
TTPU	Technical Task Plan Unit
TTR	Tonopah Test Range
TWF	Transuranic Waste Facility
TWTSF	Transuranic Waste Treatment and Storage Facility
UCD	University of California at Davis
UDH	Utah Department of Health
UMT	uranium mill tailings
UMTGR	Uranium Mill Tailings Groundwater Restoration (Project)
UMTRA	Uranium Mill Tailings Remedial Action
UMTRAP	Uranium Mill Tailings Remedial Action Program
USGS	U.S. Geological Survey
UST	underground storage tank
VCAPCD	Ventura County Air Pollution Control District

VTL	Validated Target Level
VOCs	volatile organic compounds
WACC	Waste Acceptance Criteria Committee
WAG	waste area grouping
WCF	Waste Characterization Facility
WEMS	Waste and Environmental Management System
WERF	Waste Experimental Reduction Facility
WETF	West End Treatment Facility
WGA	Western Governor's Association
WHPP	Waste Handling and Packaging Plant
WIN	Waste Information Network
WIPP	Waste Isolation Pilot Plant
WM	Waste Management
WMA	Waste Minimization Avoidance
WMC	Waste Management Complex
WMFU	Waste Minimization Facility Upgrade
WMIN	Waste Minimization
WMO	waste management operations
WNYNSC	Western New York Nuclear Science Center
WO	waste operations
WRAP	Waste Receiving and Processing (Plant)
WRP	Waste Retrieval and Processing
WRRTF	Water Reactor Research Test Facility
WVDP	West Valley Demonstration Project
Y-12 Plant	Oak Ridge Y-12 Plant
ZPPR	Zero Power Physics Reactor

APPENDIX I

GLOSSARY

GLOSSARY

Action Plan. A plan describing a specific cleanup or Corrective Activity.

Applicable or Relevant and Appropriate Requirement (ARAR). Requirements, including cleanup standards, standards of control, and other substantive environmental protection requirements and criteria for hazardous substances as specified under Federal and State law and regulations, that must be met when complying with the Comprehensive Environmental Response, Compensation, and Liability Act (from the Superfund Amendments and Reauthorization Act).

Aquifer. A geologic formation or structure that is capable of yielding water in usable quantities.

As Low As Reasonably Achievable (ALARA). A radiation protection principle applied to radiation exposures, with costs and benefits taken into account.

Atomic Energy Act (AEA). The Act (1954) that placed production and control of nuclear materials within a civilian agency, originally the Atomic Energy Commission.

Below Regulatory Concern. A level of radioactivity in waste, which is considered to be safe for human exposure and, therefore, does not require monitoring or control.

Best Available Technology (BAT) or Best Demonstrated Available Technology (BDAT). Treatment technologies that have been shown through actual use to yield the greatest environmental benefit among competing technologies that are practically available.

Byproduct Rule (DOE). DOE rule making (*Federal Register*, May 1, 1987) that established Department policy for application of the Resource Conservation and Recovery Act and the Atomic Energy Act to DOE waste containing hazardous components and byproduct materials.

Calcining. The process of making unconsolidated powder or granules by thermal evaporation and partial decomposition of high-level waste.

Characterization. Facility or site sampling, monitoring, and analysis activities to determine the extent and nature of the release. Characterization provides the basis for acquiring the necessary technical information to develop, screen, analyze, and select appropriate cleanup techniques.

Clean Air Act (CAA). Its purpose is to "protect and enhance the quality of the Nation's air resources." Its primary application is through Prevention of Significant Deterioration permits to regulate new potentially polluting facilities. Of increasing importance are the National Emissions Standards for Hazardous Air Pollutants. The CAA was passed in 1970 as amendments to 42 USC 7401.

Clean Water Act of 1977 (CWA). Amended the Federal Water Pollution Control Act first passed in 1956. Its objective is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." The Act's major enforcement tool is the National Pollutant Discharge Elimination System permit.

Closure Plan. Documentation prepared to guide the deactivation, stabilization, and surveillance of a waste management unit or facility under the Resource Conservation and Recovery Act.

Compliance Agreements. Legally binding agreements between regulators and regulated entities that set standards and schedules for compliance with environmental statutes. Includes Consent Order and Compliance Agreements, Federal Facilities Agreements, and Federal Facility Compliance Agreements.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Federal statute (also known as Superfund), enacted in 1980 and reauthorized in 1986, that provides the statutory authority for cleanup of hazardous substances that could endanger public health, welfare, or the environment.

Consent Order and Compliance Agreement (COCA). See Compliance Agreements.

Continuity of Operations. Each DOE site has activities that include developing strategic and long-range waste management plans, surveillance and maintenance of facilities and equipment, waste certification, proper training programs for personnel, and record/information administration.

Cryogenic. Using refrigerants to achieve very low temperatures.

Decommissioning. The process of removing a facility from operation, followed by decontamination, entombment, dismantlement, or conversion to another use.

Decontamination. The removal of unwanted material (typically radioactive material) from facilities, soils, or equipment by washing, chemical action, mechanical cleaning, or other techniques.

Defense Waste. Radioactive waste from any activity performed in whole or in part in support of DOE atomic energy defense activities; excludes waste under purview of the Nuclear Regulatory Commission or generated by the commercial nuclear power industry.

Defense Waste Management Plan (DWMP). This Plan (June 1983) established DOE's policy for storage and disposal of its defense high-level and transuranic wastes.

Depleted Uranium. Uranium from which the fissionable isotope uranium-235 has been removed.

Disposal. Waste emplacement designed to ensure isolation of waste from the biosphere, with no intention of retrieval for the foreseeable future, and requiring deliberate action to regain access to the waste.

DOE Orders. Internal requirements that establish DOE policy and procedures for compliance with applicable laws and regulations.

Drinking Water Standard. Concentration limits for certain elements and pollutants that may occur in drinking water; established by the Safe Drinking Water Act.

Environmentally Hardened Systems. Electromechanical systems constructed to reduce or eliminate degradation due to radiation and/or other environmental materials such as dust.

Environmental Restoration. Cleanup and restoration of sites contaminated with hazardous substances during past production or disposal activities.

Feasibility Study. A step in the environmental restoration process specified by CERCLA. The objectives of the feasibility study are to identify the alternatives for remediation and to select and describe a remedial action that satisfies the applicable or relevant and appropriate requirements for mitigating confirmed environmental contamination. Successful completion of the feasibility study should result in unimpeded subsequent development of a remedial design for implementation of the selected remedial actions.

Federal Facilities Agreement (model FFA). See Compliance Agreements.

Federal Facility Compliance Agreement. See Compliance Agreements.

Field Offices (DOE). Albuquerque, Chicago, Idaho, Nevada, Oak Ridge, Richland, San Francisco, and Savannah River.

Formerly Utilized Sites Remedial Action Program (FUSRAP). A program that addresses the cleanup of sites and adjacent properties contaminated by activities of the Manhattan Project.

Friable Asbestos. Asbestos insulation that is loose and capable of becoming airborne.

Gaseous Diffusion. A technology for separating fissionable uranium-235 isotopes from the more abundant nonfissionable uranium isotopes by pumping gaseous uranium hexafluoride through resistant barriers.

Geological Repository. A mined facility for disposal of radioactive wastes that uses natural geologic barriers to provide waste containment over geological time scales.

Greater-Than-Class-C Waste. Waste that exceeds the Nuclear Regulatory Commission concentration limits for Class C low-level waste as specified in 10 CFR 61.

Groundwater. Liquid water occurring beneath the earth's surface in the interstices between soil grains, in fractures, or in porous formations.

Groundwater Remediation. Treatment of groundwater to remove pollutants.

Hazardous Waste. As defined in the Resource Conservation and Recovery Act, a solid waste or combination of solid wastes that, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating reversible illness or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed. Hazardous wastes may be listed or characteristic.

High-Level Waste. The highly radioactive waste material that results from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid waste derived from the liquid, that contains a combination of transuranic waste and fission products in concentrations requiring permanent isolation.

Implementation Plan. A document that contains the detailed actions needed to achieve a set of specified goals and objectives.

Inactive Waste Site. Sites formerly used for the treatment, storage, or disposal of wastes.

Incineration. A treatment technology using combustion to destroy organic constituents and reduce the volume of wastes.

Intelligent Machine. See robot.

Interagency Agreement (IAG). A formal document in which two or more Federal agencies agree to cooperate.

Land Disposal Restrictions (LDRs). Provisions of Hazardous and Solid Waste Amendments requiring phased-in treatment of hazardous wastes before disposal.

Low-Level Waste. Radioactive waste not classified as high-level waste, transuranic waste, spent nuclear fuel, or byproduct material.

Low-Level Radioactive Waste Policy Amendments Act of 1985. This Act makes the Federal government responsible for disposing of Greater-Than-Class-C (higher-activity) low-level waste from commercial activities licensed by the Nuclear Regulatory Commission.

Master/Slaves. Any remote device (e.g., mobile vehicle, manipulator arm) that directly executes the commands of an operator. No computer-based intelligence assists the operator by automating all or part of a task's execution (see robot).

Memorandum of Understanding. A document stating the terms of agreement between two agencies.

Mixed Waste. Mixed waste contains both radioactive and hazardous components, as defined by the Atomic Energy Act and the Resource Conservation and Recovery Act, respectively.

National Emission Standards for Hazardous Air Pollutants (NESHAP). Clean Air Act limits for release of hazardous pollutants for which no ambient air quality standard is applicable.

National Environmental Policy Act (NEPA) of 1969. Act that established the requirement for conducting environmental reviews of Federal actions that have the potential for significant impact on the human environment.

National Pollutant Discharge Elimination System (NPDES). Section 402 of the Federal Water Pollution Control Act (a.k.a. Clean Water Act) that establishes a permit for discharges to water and provides standards by which such permits may be granted.

National Priorities List. Formal listing of the Nation's worst hazardous waste sites, as established by the Comprehensive Environmental Response, Compensation, and Liability Act.

Neutralization. Treatment of corrosive hazardous wastes to yield a pH near 7.

NO_x. Oxides of nitrogen NO_2, NO_3, etc.

Nuclear Waste Fund. A fund established by the Nuclear Waste Policy Act of 1982, which directed DOE to pursue a program toward disposal of commercial high-level and transuranic waste in a geologic repository. The nuclear waste fund assesses utilities a fee to pay for siting, development, and operation of a commercial repository. The share of the costs commensurate with the portion of the repository committed for disposal of defense wastes will be paid by DOE.

Nuclear Waste Policy Act. An act passed in 1982 and reauthorized in 1987 that directs DOE to design, site, and construct a geologic repository for the disposal of high-level radioactive waste and/or spent fuel from civilian nuclear reactors.

Operable Unit. A discrete portion of a site consisting of one to many release sites considered together for assessment and cleanup activities. The primary criteria for placement of release sites into an operable unit include geographic proximity, similarity of waste characteristics and site type, and the possibilities for economy of scale.

Performance Assessment. A term used to denote all activities (qualitative and quantitative) carried out to (1) determine the long-term ability of a site/facility to effectively isolate the waste and ensure the long-term health and safety of the public and (2) provide the basis for demonstrating regulatory compliance. Performance assessment serves as a focal point for site characterization, model development, and uncertainty analysis research activities.

Prevention of Significant Deterioration (PSD). Part C of the Clean Air Act that establishes a policy of limiting degradation of air quality based upon classification of areas.

Prime Contractor. DOE's major contractors. Principally, DOE's Management and Operating contractors.

Radioactive Waste. A solid, liquid, or gaseous material of negligible economic value that contains radionuclides in excess of threshold quantities. Does not include material contaminated by radionuclides from nuclear weapons testing.

RCRA Facility Assessment (RFA). The initial Resource Conservation and Recovery Act (RCRA) process to determine whether corrective action for a RCRA past practice unit is warranted or to define what additional data must be gathered to make this determination; analogous to a Comprehensive Environmental Response, Compensation, and Liability Act Preliminary Assessment and Site Inspection.

RCRA Facility Investigation (RFI). The RCRA process of determining the extent of hazardous waste contamination; analogous to the Comprehensive Environmental Response, Compensation, and Liability Act Remedial Investigation.

RCRA Part A Permit. The first part of a Resource Conservation and Recovery Act permit application that identifies treatment, storage, and disposal units within a to-be-permitted facility.

RCRA Part B Permit. The detailed second part of a Resource Conservation and Recovery Act permit application that describes wastes managed, quantities, and facilities.

Record of Decision (ROD). The Comprehensive Environmental Response, Compensation, and Liability Act document used to select the method of remedial action to be implemented at a site after the Feasibility Study/ Proposed Plan process has been completed.

Regulated Substance. Any chemical, compound, or material the manufacture, generation, transportation, alteration, or disposition of which is regulated under any of the Federal or State statutes.

Release Site. A location at which a hazardous, radioactive, or mixed waste release has occurred or is suspected to have occurred. It is usually associated

with an area where the hazardous, radioactive waste, mixed waste, or waste-contaminated substances have been used, treated, stored, migrated, and/or disposed of.

Remedial Investigation (RI). The Comprehensive Environmental Response, Compensation, and Liability Act process of determining the extent of hazardous substance contamination and, as appropriate, conducting treatability investigations. The RI provides the site-specific information for the feasibility study.

Reprocessing. The dissolution of spent reactor fuel and separation of uranium, transuranic elements, and fission products.

Robot. Electromechanical device that incorporates sensors and computer control to operate intelligently in remote environments. Typically, Human Assisted Computer Control is used for robot control. Thus, a robot possesses sufficient intelligence to automatically execute selected tasks and is guided in the execution of these tasks by a human operator. If the environment is well defined and as the technology matures, system control responsibilities shift from the human operator to the computing system leading to more autonomous robot systems.

Safe Drinking Water Act. The maximum contaminant levels developed under this Act are used in groundwater monitoring programs.

Sanitary Waste. Wastes, such as garbage, that are generated by normal housekeeping activities and that are not hazardous or radioactive.

Shallow Land Burial. Disposal of wastes in shallow trenches; commonly used for low-level wastes.

Spent Fuel. Irradiated nuclear reactor fuel before reprocessing. Contains uranium, fission products, and transuranic elements.

Site. For the purposes of this plan, sites are lands, installations, and/or facilities for which DOE has or shares responsibility for Environmental Restoration and Waste Management activities.

Site Inspection. The process under the Comprehensive Environmental Response, Compensation, and Liability Act to acquire the necessary data to confirm the existence of environmental contamination at identified potential sites and to assess the associated potential risks to human health, welfare, and the environment. The data collected at each site must be sufficient to support the decision for either continuing with a remedial investigation/feasibility study or for removing the site from further investigation through a decision document.

Sole-Source Aquifer. As defined by the Safe Drinking Water Act, an aquifer that is the only source or potential source of drinking water in an area.

Solid Waste Management Unit (SWMU). Any unit at a facility from which hazardous constituents might migrate, irrespective of whether the unit was intended for the management of solid and/or hazardous waste. Includes, but is not limited to, container storage areas, tanks, surface impoundments, waste piles, land treatment units, landfills, incinerators, injection wells, recycling operations, miscellaneous units, and releases from such units.

Storage. Retention and monitoring of waste in a retrievable manner pending final disposal.

Superfund Amendments and Reauthorization Act (SARA). The 1986 Act amending and reauthorizing the Comprehensive Environmental Response, Compensation, and Liability Act.

Surplus Facility. Any facility or site (including equipment) that has no identified programmatic use and may or may not be radioactively contaminated to levels that require controlled access.

Toxic Substances Control Act (TSCA). TSCA was enacted in 1976 to protect human health and the environment from unreasonable risk due to exposure to, manufacture, distribution, use, or disposal of substances containing toxic chemicals. Under TSCA, any hazardous wastes that contain more than 50 parts per million of polychlorinated byphenyls are subject to regulation under this Act.

Transpiration. Process by which vegetation transfers water into the atmosphere.

Treatment. Any activity that alters the chemical or physical nature of a hazardous waste to reduce its toxicity, volume, mobility, or render it amenable for transport, storage, or disposal.

Transuranic (TRU) Waste. Waste that is contaminated with alpha-emitting transuranium nuclides with half-lives greater than 20 years and concentrations greater than 100 nanocuries per gram of waste.

Tri-Party Agreement. An agreement signed by DOE, EPA, and States that identifies milestones for key waste management actions.

Underground Storage Tank (UST). Any tank or associated piping containing hazardous materials as defined by the Hazardous and Solid Waste Amendments (Subtitle C or Subtitle I).

Uranium Mill Tailings Radiation Control Act of 1978. This Act directed DOE to provide for stabilization and control of the uranium mill tailings from inactive sites in a safe and environmentally sound manner to minimize radiation health hazards to the public. It authorizes DOE to undertake remedial actions at 24 designated inactive uranium processing sites and at an estimated 5,048 vicinity properties.

Vadose Zone. The unsaturated soil zone (as opposed to the saturated or water bearing soil zone).

Vitrification. The process of immobilizing waste that produces a glass-like solid that permanently captures the radioactive materials.

Vitrify. To form into a glass-like material by heat and melting.

Waste Area Grouping (WAG). A grouping of facilities and/or release sites with areawide soil and/or groundwater contamination that is not readily traceable to individual facilities or sites. Generally, a WAG would be limited to a geographically contiguous and hydrologically defined area.

Waste Isolation Pilot Plant (WIPP). Research and demonstration facility located at Carlsbad, New Mexico, intended to demonstrate safe disposal of radioactive waste in a deep geologic environment. A decision on whether to convert WIPP to a disposal facility for transuranic waste will be made after successful testing is demonstrated.

Waste Minimization. The reduction, to the extent feasible, of hazardous waste that is generated prior to treatment, storage, or disposal of the waste. Waste minimization includes any source reduction or recycling activity that results in either (1) reduction of total volume of hazardous waste (2) reduction of toxicity of hazardous waste or (3) both.

Waste Stream. Terminology used to refer to waste leaving a facility or operation.

Zeolites. Any of various hydrous silicates used as ion-exchangers frequently used in water softening.

FIVE-YEAR PLAN COMMENT SHEET

The U. S. Department of Energy's Office of Environmental Restoration and Waste Management (EM) recognizes that cleaning up the Nation's nuclear-related sites and facilities will impact many different segments of the public, ranging from the communities surrounding these sites and facilities, to the research laboratories developing new technologies to assist in the cleanup. We encourage your comments on the Five-Year Plan. Please mail your comments to the address below. Your may submit as many pages as you like. Your input is greatly appreciated.

_____ Please keep my name on the Five-Year Plan mailing list.

_____ Please remove my name from the Five-Year Plan mailing list.

_____ Please send me more information on EM activities.

U. S. Department of Energy
Office of Environmental Restoration and Waste Management
Mail Stop EM-2.5
1000 Independence Avenue, S. W.
Washington, DC 20585

Comments: _____

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NAME ORGANIZATION

ADDRESS CITY, STATE ZIP CODE