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Ms. Judith Espinosa
New Mexico Environment Department
Harold Runnels Building
1190 St. Francis Drive, Room N4050
Santa Fe, NM 87502

Dear Ms. Espinosa:

I am pleased to submit the Department of Energy's preliminary FY 1994-1998 Environmental Restoration and Waste Management Five-Year Plan for your review and comment.

Consistent with your suggestions, this plan is designed to (1) clearly show program progress in terms of success in meeting--or failing to meet--previous commitments, and (2) frankly describe the challenges ahead and the strategies selected to meet them. The format of this Five-Year Plan has also evolved from that of the five-year plans that preceded it. The plan's format has been modified to make it more informative and accessible to the general public.

As you are aware, Section 3135 of Public Law 102-190--the National Defense Authorization Act for FY 1992 and FY 1993--requires both preliminary and final versions of the Five-Year Plan to be submitted to the States, Congress, Tribes, and the public. Release of this preliminary Five-Year Plan also starts a 60-day public comment period. Your comments will be addressed before the Five-Year Plan is finalized in mid 1993.

I have also enclosed a copy of the student edition of the plan to aid in the public review process. The Five-Year

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TR

Plan development process strives to be open, integrated, and effective in directing the Department's environmental activities. While the challenges are significant, STGWG's continuing support will ensure that we accomplish our critical environmental goals.

Sincerely,

Leo P. Duffy
Assistant Secretary for Environmental
Restoration and Waste Management

Enclosures

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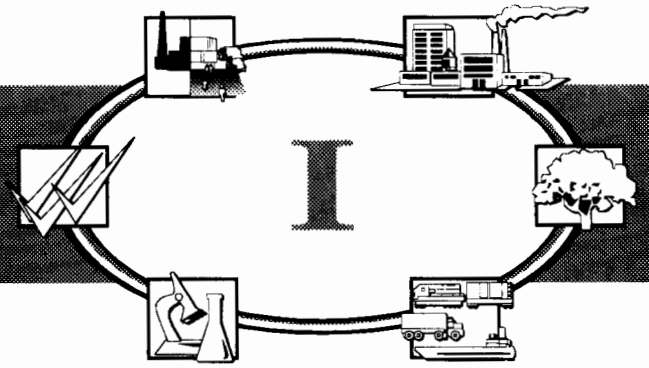
U.S. Department of Energy

Environmental Restoration and Waste Management Five-Year Plan

Fiscal Years 1994-1998

Volume I



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January 1993

U.S. DEPARTMENT OF ENERGY
ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT
FIVE-YEAR PLAN COMMENT SHEET

The U.S. Department of Energy (DOE) understands that cleaning up the Nation's nuclear-related sites and facilities affects many different segments of the public, ranging from communities near DOE facilities to engineers concerned with developing new technologies to clean up the environment. In an effort to make the Environmental Restoration and Waste Management Five-Year Plan more responsive to your concerns, DOE invites your comments on the plan. Volumes I and II of the Five-Year Plan were released for a 60-day public comment period that ends in March 1993.

Your comments will be taken into consideration in the development of next year's Five-Year Plan and will be responded to in the final Five-Year Plan. Please mail your comments to the address below. You may submit as many pages as you like. Your input is greatly appreciated.

_____ Please remove my name from the Five-Year Plan mailing list.

U.S. Department of Energy
Office of Environmental Restoration and Waste Management
Office of Planning, EM-14
1000 Independence Avenue, S.W.
Washington, DC 20585

Comments: _____

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Name Organization

_____
Address City, State

FY 1994–1998
FIVE-YEAR PLAN
CONTENTS

VOLUME I.

EXECUTIVE SUMMARY i

PART 1. DOE FIVE-YEAR PLAN FOR ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT

1.0 A Reader's Guide to the Five-Year Plan 3
1.1 EM Mission, Vision, and Objectives 8
1.2 Accomplishments and Setbacks: Measuring Progress 13
1.3 Issues and Trends 23
The Changing DOE Mission
Land-Use Planning
Contingency Fund
Complex Legal and Regulatory Climate
Safeguards and Security
1.4 Status of Initiatives from the FY 1993–1997 Five-Year Plan 29
Cost Management and the Interagency Review Group Findings
Setting Priorities
Updating Contracting Strategies
Tracking Program Progress
Improving Relations with States, Indian Tribes, and Other Federal Agencies
1.5 Resource Planning for Future Activities 42
1.6 Objectives for Environmental Restoration and Waste Management 47
1.6.1 Credible Decision Making through Sound Planning 48
1.6.2 Credible Decision Making through Public Participation 53
1.6.3 Facility Transition, Acceptance, Deactivation, and Disposition 59
1.6.4 Elimination of Unacceptable Risk 64
1.6.5 Commitment to Regulatory Compliance 69
1.6.6 Preventing Pollution at its Source 77
1.6.7 Human Resources and Capital Assets 81
1.6.8 Efficient Use of Resources 86
1.6.9 Ensuring Safety and Health 91

FY 1994–1998
FIVE-YEAR PLAN
CONTENTS

PART 2. PROGRAM PLANS

2.0 Introduction 99

Waste Management and Corrective Activities

2.1.0 Program Overview - The EM Waste Management Program 103
2.1.1 Waste Minimization 105
2.1.2 Corrective Activities 108
2.1.3 High-Level Waste and Spent Nuclear Fuel 110
2.1.3.1 Tank Safety 114
2.1.4 Transuranic Waste 116
2.1.4.1 Waste Isolation Pilot Plant 118
2.1.5 Low-Level Waste 122
2.1.6 Commercial Low-Level Waste 124
2.1.7 Mixed Low-Level Waste 127
2.1.8 Hazardous Waste 129
2.1.9 Sanitary Waste 131
2.1.10 Program Management: Systems and Tools 133
2.1.11 Issues and Strategies 136

Environmental Restoration

2.2.0 Program Overview 141
2.2.1 Progress in Establishing an Effective Management System 145
2.2.2 Success in Developing Program Baselines and Associated Management Systems 148
2.2.3 Initiatives That Support the Environmental Restoration Management System 150
2.2.4 Northwestern Area Programs 155
2.2.5 Southwestern Area Programs 160
2.2.6 Eastern Area Programs 166

Facility Transition and Management

2.3.0 Program Overview 175
2.3.1 Systems Integration Approach to Facility Transition and Management 177
2.3.2 Transition Planning Considerations 180
2.3.3 Internal/External Interfaces 181
2.3.4 Accomplishments and Future Activities 183

FY 1994–1998
FIVE-YEAR PLAN
CONTENTS

Technology Development

2.4.0 Program Overview 187
2.4.1 Technologies for Cleaning Up Contaminated Groundwater and Soils 190
2.4.2 Technologies for Retrieving and Processing Waste 194
2.4.3 Technologies that Avoid or Minimize Waste Generation 197
2.4.4 Supporting Technologies and Infrastructure 200
2.4.5 Effective Technology Integration and Environmental Education 208
2.4.6 Program Management 212
2.4.7 Technology Issues and the Strategies to Resolve Them 214

Transportation Management

2.5.0 Transportation Management 221
2.5.1 Managing Transportation Activities 223

APPENDICES

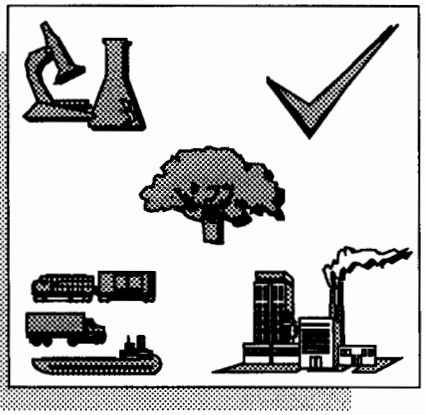
A. National Defense Authorization Act for Fiscal Years 1992 and 1993, Section 3135 ..... A-1
B. How DOE Is Organized B-1
C. Strategic Plan for Environmental Restoration and Waste Management C-1
D. DOE Sites and Facilities with Environmental Restoration and Waste Management Responsibilities D-1
E. DOE Public Reading Rooms E-1
F. Compliance Agreements, Consent Decrees, and Agreements-in-Principle F-1
G. Planning Estimates by Activity Data Sheet G-1
H. Federal Pollution Abatement Plan (A-106) Relationship to EM ADSs H-1
I. Planning Process and Documents List ..... I - 1
J. State and Tribal Government Working Group and Stakeholders' Forum Comments on Predecisional Drafts J-1
K. List of References K-1

GLOSSARY

ACRONYMS (inside back cover)

Volume II: INSTALLATION SUMMARIES

Volume III: RESULTS OF PUBLIC COMMENTS ON PRELIMINARY FIVE-YEAR PLAN (to be published in Spring 1993)



Executive Summary

FY 1994–1998
ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT
FIVE-YEAR PLAN
EXECUTIVE SUMMARY

Introduction

In March 1989, Secretary of Energy James D. Watkins outlined his vision for a changed Department of Energy (DOE) culture. This culture is one of environmental responsibility, increased knowledge and involvement in environmental management, a new openness to public input, and overall accountability to the Nation for its actions. Secretary Watkins also requested all the near-term activities necessary to bring DOE activities into compliance with all applicable environmental requirements to be detailed in one plan. The Five-Year Plan was to be based on a "bottom up" approach to planning by using Activity Data Sheets to collect financial and technical information at the installation level. Over the past three years, the Five-Year Plan has evolved into the primary planning tool for the DOE Environmental Restoration and Waste Management Program, looking beyond the current three-year Federal budget horizon. The FY 1994–1998 Five-Year Plan demonstrates DOE's commitment to a culture based on the principles of openness, responsiveness, and accountability; reports on the progress made in carrying out DOE's environmental mission; identifies what must be accomplished during a five-year planning period; and describes strategies for achieving critical program objectives. This plan represents another step towards the implementation of the culture change Secretary Watkins envisioned.

The Five-Year Plan is not exclusively focused on near-term activities. It also expresses the DOE commitment to a 30-year goal for the cleanup of the 1989 inventory of inactive sites. This goal was established in response to recommendations from the State and Tribal Government Working Group (STGWG) that DOE define a specific end point for completing necessary remediation and restoration activities. The FY 1994–1998 Five-Year Plan reiterates the DOE commitment to meeting this and other important environmental goals.

The DOE essential environmental restoration and waste management mission continues to change in response to new global realities. Specifically, the restructuring of the former Soviet Union and the attendant shift in DOE responsibilities are leading to projected changes in the configuration of the DOE weapons complex with decisions to phase out and consolidate operations. These changes are expected to cause, in turn, a major growth in the size and scope of the decontamination and decommissioning, conversion, recycling, and reuse activities of the DOE Office of Environmental Restoration and Waste Management (EM).

Planning Uncertainties

While the budget for environmental restoration and waste management activities has tripled during the past three years, it is not realistic to assume this rate of growth will be maintained. The total estimate for environmental restoration and waste management activities for FY 1994 is $6.1 billion. As reflected in Figure ES-1, 62 percent of these activities are legally driven; 24 percent are other environment, safety and health activities (required by internal DOE Order); and 14 percent are allocated for other desirable program activities.

Significant uncertainties are inherent in the EM program and may, therefore, require later adjustments. However, it is important to emphasize that independent cost reviews and further assessments of scope, legal requirements, and critical decision milestones will resolve many of these uncertainties prior to the end of the calendar year and before the President's FY 1994 budget is submitted to Congress. These uncertainties fall into four categories: technical scope, regulatory, technological, and those related to facility transition. DOE intends to manage these uncertainties by reallocating budgetary resources; by requesting funds through the normal appropriations process; by requesting supplemental appropriations when necessary; by reprogramming to facilitate critical milestone completion when possible; by investing early in technologies critical to remediation under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); and by applying conflict resolution procedures when absolutely necessary (and technically appropriate). For FY 1994–1998, the Environmental Restoration and Waste Management Five-Year Plan assumes growth of between five and ten percent per year.

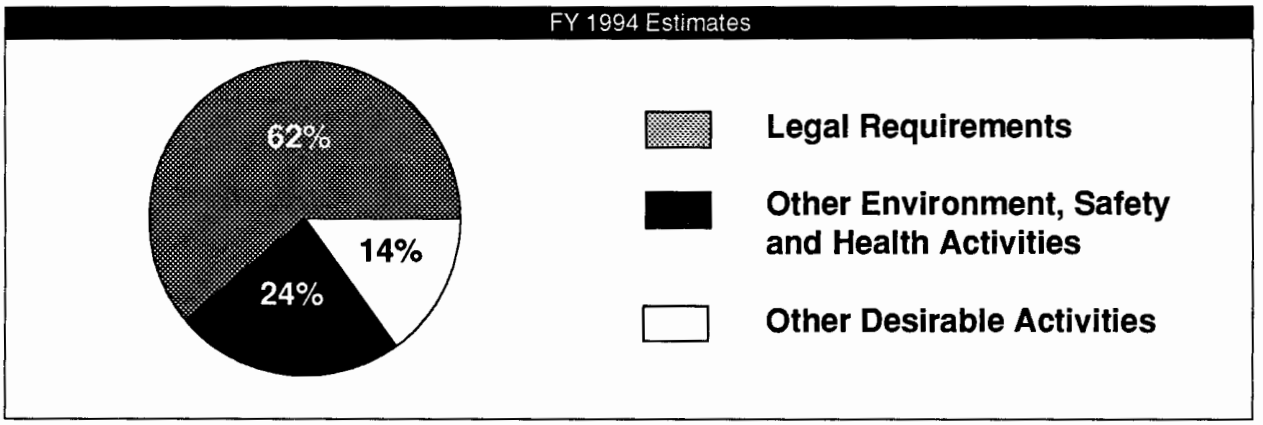


Figure ES-1.

Technical Scope: Developing planning estimates requires an accurate vision of future technical requirements for environmental restoration and for waste treatment, storage, and disposal. For example, at the Hanford Site there are 177 metal tanks containing waste generated as a result of plutonium separation processes. The tanks themselves comprise 410,000 metric tons of material that will have to be deactivated, decontaminated, decommissioned, and dismantled. While DOE has made substantial progress toward the resolution of safety issues associated with the storage of high-level radioactive waste in tanks, uncertainties regarding the number of new tanks and their design requirements will remain until studies related to the Tank Waste Remediation System are completed. Likewise, it is difficult to establish the technical strategy for the Hanford Waste Vitrification Plant until DOE has confirmed the basic feasibility of the vitrification technology through successful cold and hot runs at the Defense Waste Processing Facility at Savannah River.

Regulatory Compliance: The nature of the regulatory compliance process also affects the development of prudent estimates. Sequential regulatory requirements, such as those of CERCLA, can ultimately delay the construction of treatment, storage, and disposal facilities as well as the initiation of actual waste management and remediation operations. These regulatory difficulties may be further complicated by concurrent application of potentially overlapping environmental control statutes. The variability and uncertainty of the current regulatory process contributes to increasing costs and scheduling uncertainty.

Technology Development: Clearly, a key to controlling program costs is to develop innovative technologies that will enable DOE to accomplish remediation in a more cost-effective manner than possible with current technologies, such as pumping and treating contaminated groundwater. Both the Environmental Protection Agency (EPA) and DOE recognize that the most costly remediation activities are those that involve large areas with relatively low levels of contamination. The trade-off DOE faces is whether to commit funds to clean up sites that do not pose an immediate threat using current technology that may only be moderately effective and costly, or to commit funds to develop technology that may in the future provide a more effective and less costly solution, while stabilizing the contaminants until that technology becomes available. DOE is committed to quickly cleaning up sites that represent an immediate threat to human health and the environment.

Many DOE sites are geographically remote and, therefore, pose fewer potential health risks. At these sites, rather than moving directly to expensive remediation options of questionable efficacy, it may be more effective to focus on long-term stabilization of the wastes. Unfortunately, technology uncertainties and existing regulatory requirements often bind DOE to available remediation alternatives in which the costs outweigh the risk reduction benefits.

Facility Transition: As the DOE defense mission changes, EM will increasingly be assigned the responsibility for managing facilities that were formerly operated by the weapons production program and other DOE elements. However, substantial uncertainties exist regarding the timing of transfers and the identification of designated surplus facilities. These uncertainties could greatly affect the need to revise current EM planning estimates. For example, currently projected estimates of transfers from DOE Defense Programs exceed $500 million. Negotiations are currently under way between EM and each DOE element effecting facility transfers to clarify the risks, responsibilities, and resources expected from each program during the transition process.

Meeting Critical Program Challenges

The environmental task facing DOE is enormous and continues to expand. DOE has approximately 4,000 contaminated sites covering tens of thousands of acres and replete with contaminated hazardous or radioactive waste, soil, or structures. It has more than 250,000 cubic meters of transuranic waste and millions of cubic meters of low-level radioactive waste. In addition, DOE is responsible for thousands of facilities awaiting decontamination, decommissioning, and dismantling. Consequently, EM faces major technical, planning, and institutional challenges in meeting its expanding environmental responsibilities while controlling cost growth. Among these challenges are: (1) developing technically sound, cost-effective technologies to apply to cleanup and waste management problems; (2) establishing a risk management strategy that is acceptable to regulators and the public; (3) developing a consensus on the ultimate use of DOE sites and facilities; (4) meeting worker health and safety needs; and (5) managing the facility transfer process.

Developing New Technologies

A central challenge facing EM is the need to develop new technologies that will assist DOE in cleaning up its sites faster, better, safer, and cheaper. The window of opportunity to impact costs through technology development is relatively narrow. As illustrated in Figure ES-2, for example, for the remediation of volatile organic compounds (VOCs) in arid soil, the majority of Records of Decision (RODs), which determine the selected remedial action, are scheduled to be completed by 1995. To impact these decisions, new technologies should be proven and in place in advance. The situation is

similar across EM facilities. For new technologies to significantly lower remediation costs, modifications to the current regulatory compliance framework will be required. These changes must be pursued in cooperation with other Federal agencies, States, Indian Tribes, and the general public.

Technology development challenges can be organized into six major categories: (1) removal and recovery; (2) in situ (in place) treatment and stabilization; (3) ex situ (off-site) treatment and stabilization; (4) disposal; (5) in situ isolation; and (6) decontamination and decommissioning of nuclear facilities. The first area is associated with the recovery of radioactive wastes—low-level, high-level, and transuranic wastes. DOE has a need for less costly and less cumbersome methods to control contamination, more efficient methods to retrieve and reduce waste, and better means to monitor contaminant and container integrity during removal activities. Almost every DOE site needs to be able to safely remove waste for treatment and/or disposal. If this need is not met, such waste will continue to be a source of contamination.

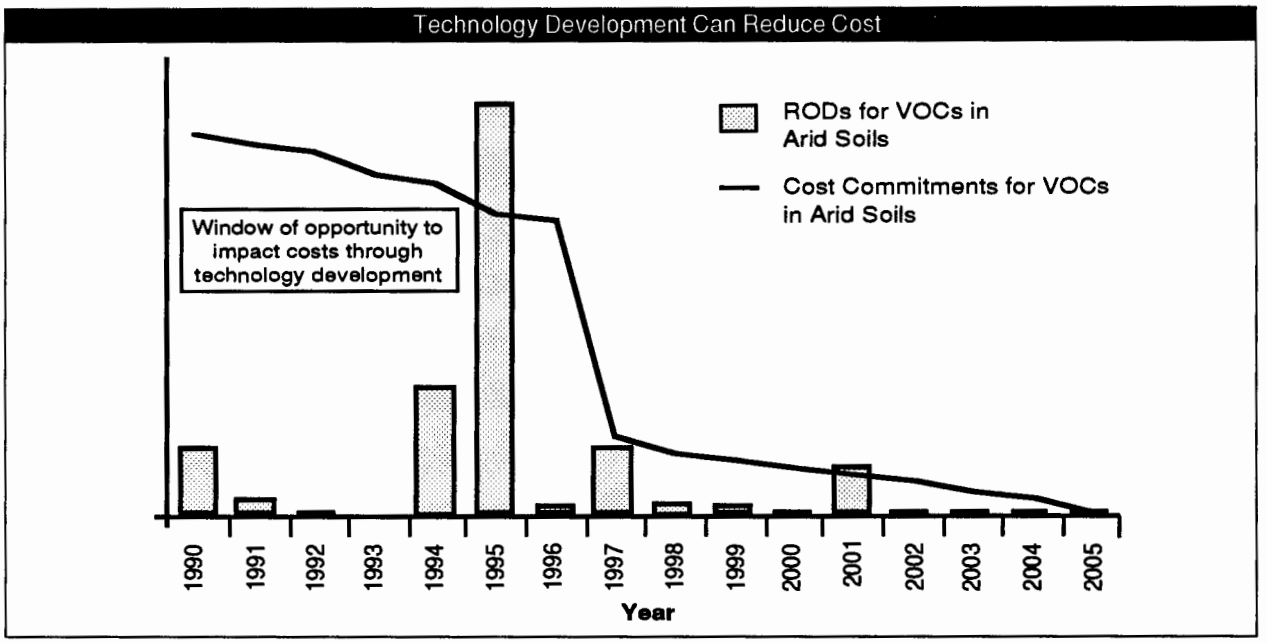


Figure ES-2.

The second area in which DOE needs to develop technology is in situ treatment and stabilization of waste. In this area, current technologies are generally unproven, of questionable effectiveness, or in such an early stage of development that they require significant demonstration before they can be seriously considered.

The third area is ex situ treatment and stabilization. Today's waste treatment methods generate large volumes of secondary waste, have a marginal effectiveness on mixed (radioactive and hazardous) waste, or do not meet increasingly stringent standards for waste disposal. DOE also needs to minimize the secondary waste stream so that disposal capacity is not exceeded. New technologies will help EM decontaminate and decommission nuclear weapons facilities, as well as remediate other problems such as contaminated soils around burial grounds and waste storage tanks.

The fourth and fifth areas of technology need are waste disposal and in situ isolation. For example, if it is decided that wastes should remain and be disposed of on-site, DOE will have to develop design criteria

and technologies that will be acceptable for facilities over aquifers that might be sources of drinking water. For in situ isolation, pretreatment technologies will be needed to make waste acceptable for disposal.

The sixth and final area is associated with the decontamination and decommissioning of nuclear facilities. Current methods to decontaminate and decommission are very time- and labor-intensive and, consequently, very costly. DOE needs better separation and partitioning methods to separate hazardous and radioactive components, to remove specific contaminants from mixtures, to separate diluted contaminants from concentrated mixtures, and to separate clean from contaminated materials. DOE also needs better methods to handle concentrated secondary waste streams.

DOE intends to meet these technology development challenges through investments in promising technology projects and through cooperative research and development projects with private industry and national laboratories. Already these investments are realizing significant cost savings.

Managing Risk

The current array of applicable or relevant and appropriate regulatory requirements, the lack of understanding of the limitations of current technologies, the uncertainties in the ultimate disposition of wastes, and the uncertainties involved in quantifying risks are obstacles to reducing risks in a cost-effective, efficient, and timely fashion. DOE must work in cooperation with other Federal agencies and stakeholders to develop acceptable standards for cleaning up contaminated sites and to promulgate general radiation standards based on human health and ecological risks. Of course, cleanup action based on these standards will have to be applied on a site-by-site basis because risks are different at each site. Specifically, a small, "wet" site (i.e., with water present) in a populated area may have the potential for higher risk due to the proximity of the community and the migration of contaminants. While greater contamination in the middle of a larger, "dry" site that is far from populated areas may still have the potential for harm, the relative risks are much lower because of its remoteness and lack of potential migration pathways.

One example of effective risk management is the Uranium Mill Tailings Ground Water Project. Previously, it was assumed that ground water at many of the 24 designated sites would be cleaned using often ineffective "pump and treat" technologies. Recently the program was reprioritized using a risk-based strategy with a variety of compliance options to meet regulatory requirements. The estimated cost of this new approach is $574 million, which represents a more than 50-percent reduction, and the project duration to achieve regulatory compliance has been reduced by 13 years.

The cleanup of radiologically contaminated sites will generate large quantities of radioactive waste and mixed radioactive and hazardous waste. Much of the waste that will be classified as mixed radioactive and hazardous waste will contain extremely low concentrations of radionuclides, barely above background radiation levels. The management, treatment, and ultimate disposal of all these wastes will play a crucial role in determining the success and cost-effectiveness of the overall remediation effort. To be successful, DOE will require a comprehensive set of risk-based standards for residual radioactive materials that would allow reuse, treatment, and disposal of these wastes in specified ways without dual regulation under the Resource Conservation and Recovery Act (RCRA) and the Atomic Energy Act. For example, such standards might allow slightly radioactive hazardous wastes to be safely treated and disposed of at a RCRA-permitted facility. Without these standards, large volumes of waste and other materials will be managed as radioactive, despite the fact that the health and environmental risks associated with them may not warrant such management. In turn, this will raise the costs of remediation, lower the cost-effectiveness of the projects, and place severe strain on limited national resources for the treatment and disposal of radioactive and mixed waste.

Associated with the challenge of establishing a comprehensive risk management strategy is the need to arrive at a definition of "how clean is clean," as well as decisions regarding the ultimate uses of remediated sites and facilities. DOE must work in concert with regulatory agencies to establish de minimis levels for land, materials, and surplus facilities. DOE has more than 7000 buildings at 39 sites and other areas where there are valuable materials that can be recycled. However, recycling cannot commence until standards for "how clean is clean" are codified. Likewise, it has to be recognized that not all DOE sites can be returned to "green field" (pristine) conditions; nor would it be cost-effective or rational to do so. DOE is beginning to address the challenge of land-use issues—some of the most crucial and potentially contentious issues it faces. The present situation leaves DOE in the uncertain position of having unbounded cleanup goals. DOE is undertaking a major initiative to address land-use planning and management issues and is working with Federal, State, and local governments to develop realistic alternative land-use scenarios.

Ensuring Worker Health and Safety

Another critical challenge is the need to develop, implement, and sustain a structured, integrated, and accountable safety and health program throughout all of EM's activities and operations. In the past, the relative youth of the organization, coupled with its rapid growth and mission expansion, obscured the full scope of the health and safety challenge facing EM. To strengthen its health and safety program, EM is undertaking several initiatives, including developing and implementing formal safety and health requirements that go well beyond those specified in compliance agreements. It is also acquiring the type and quantity of skilled and experienced personnel necessary to support safety and health programs at all facilities.

Managing Facility Transfers

The biggest challenge facing DOE may be the deactivation, decommissioning, decontamination, dismantling, and recycling of facilities and sites that are part of the weapons complex. These processes are highly interdependent; consequently, a key prerequisite to meeting the facility transfer challenge is the development of an integrated process that comprehensively approaches the interrelated issues associated with disassembly, packaging, treatment, detoxification/deactivation, and, ultimately, reuse.

A first step in developing an integrated systems approach to decontamination and decommissioning is to compile an inventory of DOE facilities. Through its Capital Asset Management Process, DOE identifies the projects associated with every significant capital asset in the nuclear weapons complex. This system will be useful in planning the transfer of management responsibility for former or surplus defense facilities to the EM program. DOE is also developing a decontamination and decommissioning systems analysis model that will evaluate different potential transfer scenarios and a priority model that will be used to aid the decision-making process for environmental restoration (both remedial action and decontamination and decommissioning) projects across the DOE complex. This model incorporates such factors as risk, regulatory drivers, and cost. It is intended to help evaluate alternatives to addressing competing program priorities in the face of finite resources.

Charting EM Progress

DOE progress toward fulfilling commitments in environmental restoration and waste management is captured on the National Progress Chart, which shows key accomplishments and major near-term commitments (Figure ES-3). This chart facilitates the overall assessment of progress within the program by showing the status of key program milestones.

Accelerated Cleanup and Site Closures

Significant steps have been taken to accelerate major cleanup projects, and DOE made substantial progress in completing site closures during FY 1991. For example, the 58-acre Mixed Waste Management Facility at the Savannah River Site was closed and certified by the South Carolina Department of Health and Environmental Control, completing the largest mixed waste site closure in the United States to date. Also at the Savannah River Site, the M-Area Settling Basin was closed and the adjacent Carolina Bay was restored. At the Oak Ridge Y-12 Plant, seven RCRA sites were certified closed by the State of Tennessee—the first RCRA sites to be certified closed at Oak Ridge. Under the Uranium Mill Tailing Remedial Action Project, cleanup of contaminated vicinity properties was completed at 224 locations in Grand Junction, Colorado, with similar work completed at 51 other sites in Colorado, Utah, Arizona, and Idaho.

Cleanup agreements are important mechanisms for State, Tribal, and local participation in setting DOE priorities and measuring progress. Among the many agreements executed recently are the Interagency Agreement for Rocky Flats, signed on January 22, 1991, establishing the framework for the entire site environmental restoration program; the Consent Order, signed in December 1991, setting the permitting schedule to bring Hanford operations into compliance with Washington State law governing waste discharges; the comprehensive Idaho National Engineering Laboratory Federal Facility Agreement and Consent Order, signed in December 1991; and the Interagency Agreement for the Oak Ridge Reservation, effective January 1, 1992.

Improved Waste Management Operations

DOE has made substantial progress toward improving operational health and safety and efficiency at several sites within the complex. For example, by working closely with the Defense Nuclear Facilities Safety Board, EM made significant strides in improving operational safety at the Hanford High-Level Waste Tank Farms. The Toxic Substances Control Act Incinerator, located at Oak Ridge, became fully operational in April 1991 and treated 2.1 million pounds of liquid mixed waste in FY 1991. This facility is the only currently operating mixed waste incinerator in the DOE complex.

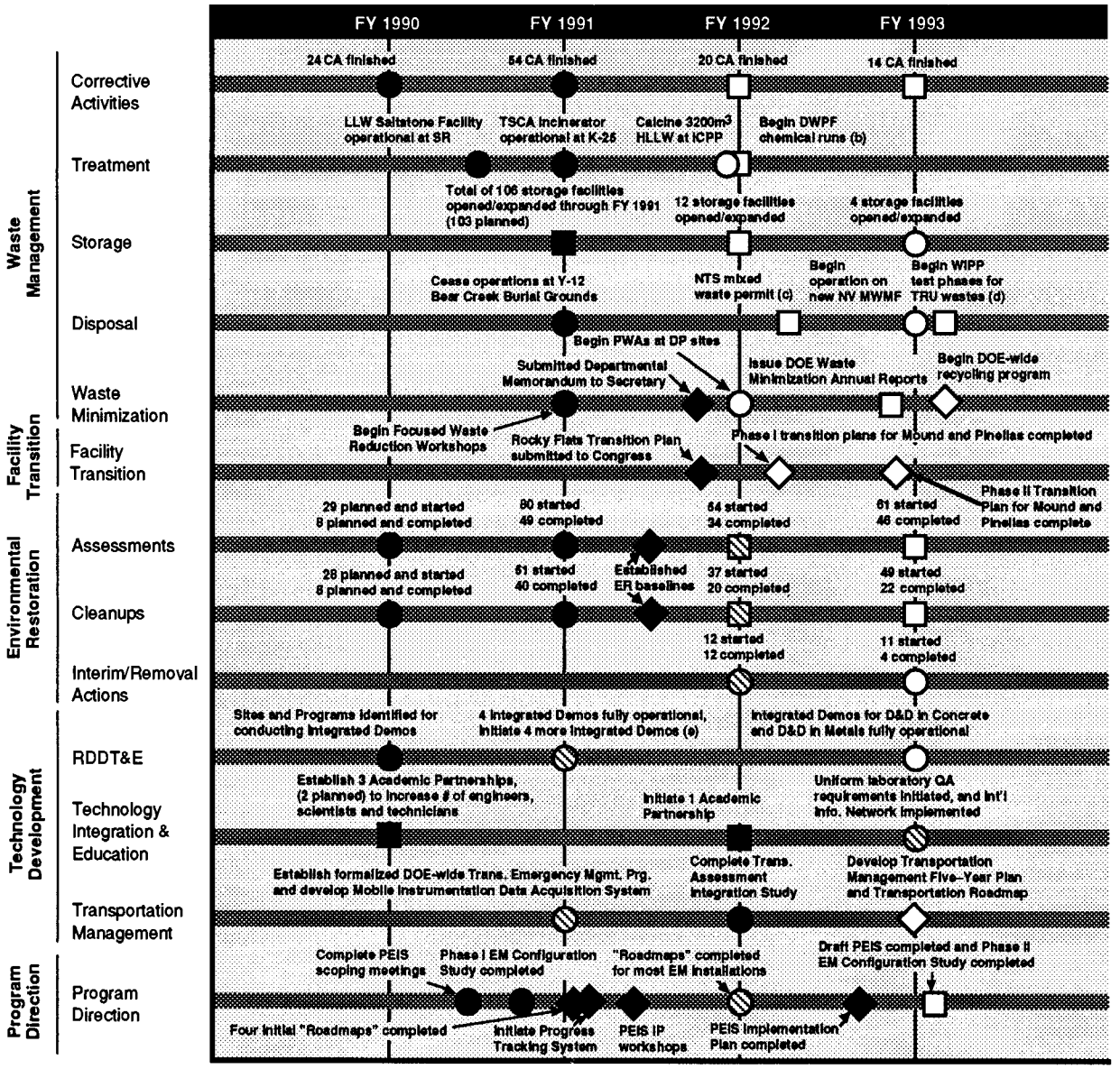
Completion of construction and commissioning activities for the Defense Waste Processing Facility at the Savannah River Site continued in FY 1991. Initial testing and experimental work identified several technical concerns that required modifications to the plant design. Significant testing of the plant systems will begin in FY 1993, and radioactive waste processing operations are scheduled to begin in FY 1994.

The Waste Isolation Pilot Plant (WIPP), located near Carlsbad, New Mexico, was constructed as the Nation's first research and development facility with the mission of demonstrating the safe disposal of transuranic waste in a geologic repository. Since October 1991, WIPP has been ready to receive transuranic radioactive waste for experimental testing. However, waste shipments to WIPP have been postponed due to lawsuits filed against the Department and subsequent court decisions.

On October 30, 1992, Congress passed, and the President signed into law, the WIPP Land Withdrawal Act (PL 102-579). In addition to withdrawing public lands surrounding the WIPP site, the new law established a new regulatory framework for WIPP involving regulatory oversight by EPA and other Federal agencies. It contains numerous prerequisites for both the Test and Disposal Phases. Implementation of the WIPP Land Withdrawal Act is a top priority for DOE. The earliest date that DOE can begin the first Test Phase shipments, assuming all the law's prerequisites are met within the statutory deadlines, is August 1993. As DOE works to meet the law's requirements, the WIPP site is maintaining readiness to receive initial waste shipments.

National Progress Chart for the Environmental

Timeline represents accomplishments at the end of each fiscal year (Federal fiscal year begins on



Legend:

Milestone Types (indicated by shape)

- ○ Unchanged from FY 1993–1997 Five-Year Plan (Milestones explanations above milestones)
- ◇ New since FY 1993–1997 Five-Year Plan
- □ Changed from FY 1993–1997 Five-Year Plan

Milestone Status (indicated by shade)

- ○ ◇ □ Planned
- ◍ ◈ ▨ 50% Completed
- ● ◆ ■ Completed

Notes:

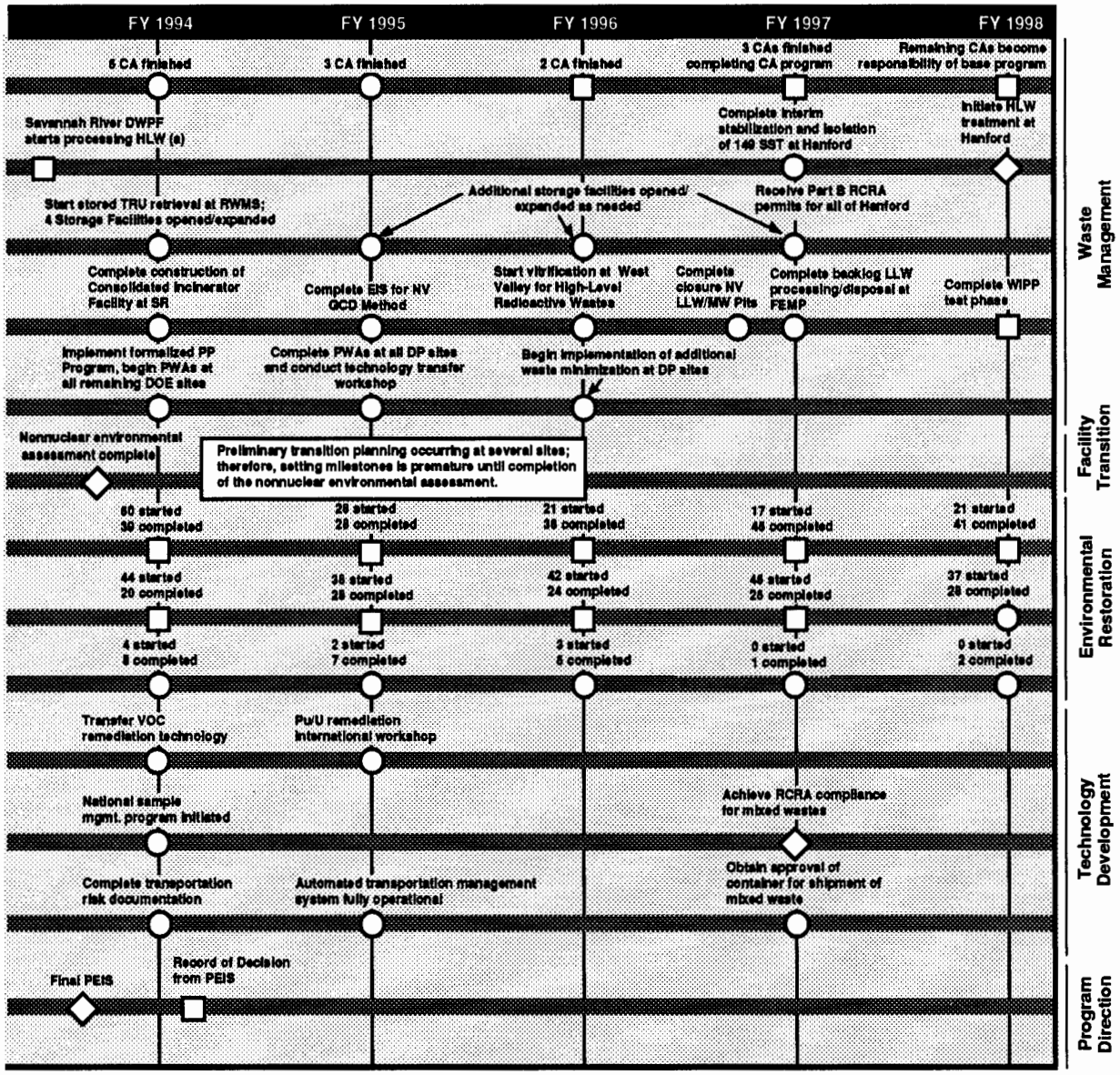
This chart does not identify all activities.
See Installation Summaries for additional information.

(a) Slippage due to problems associated with new technology.
(b) Delayed to resolve major technical issues.
(c) Slippage due to delay in receipt of Nevada approval of LDR waste analysis plan needed for permit.
(d) WIPP schedule delayed by court injunction.
(e) Operational Demos are VOCs in Saturated Soils, Buried Waste, Environmentally Conscious Manufacturing, and Depleted Uranium; Initiated Demos are Cleanup of Plutonium in Soils, Cleanup of Uranium in Soils, Cleanup of VOCs in Unsaturated Soils, and Underground Storage Tank Remediation.

Figure ES-3.

Restoration and Waste Management Program

October 1 and ends September 30).



Acronyms:

CA = Corrective Activities
D&D = Decontamination and Decommissioning
DP = Defense Programs
DWPF = Defense Waste Processing Facility
EIS = Environmental Impact Statement
FEMP = Fernald Environmental Management Project
GCD = Greater Containment Disposal
HLLW = High-Level Liquid Waste
HLW = High-Level Waste
HWVP = Hanford Waste Vitrification Plant
ICPP = Idaho Chemical Processing Plant
IP = Implementation Plan
LDR = Land Disposal Restrictions
LLW = Low-Level Waste
MW = Mixed Waste
MWMF = Mixed Waste Management Facility
NTS = Nevada Test Site
NV = Nevada
OU = Operable Unit
PEIS = Programmatic Environmental Impact Statement
PP = Pollution Prevention
Pu/U = Plutonium/Uranium
PWA = Process Waste Assessment
QA = Quality Assurance
RDDT& E = Research, Development, Demonstration, Testing and Evaluation
RI/FS = Remedial Investigation/Feasibility Study
RWMS = Radioactive Waste Management Site
SR = Savannah River
SST = Single-Shell Tanks
TI & ED = Technology Integration and Education
TRU = Transuranic
TSCA = Toxic Substances Control Act
UMTRA = Uranium Mill Tailings Remedial Action
VOC = Volatile Organic Compound
WIPP = Waste Isolation Pilot Plant

Figure ES-3.

Reducing Waste Generation

The Secretary of Energy instituted a high-priority, DOE-wide initiative to develop, promote, and implement cost-efficient pollution prevention technologies, practices, and policies. The initiative establishes an integrated DOE waste minimization/pollution prevention program and gives focus and priority to what has been, to date, a largely ad hoc effort. EM is leading and coordinating planning and policy development for this initiative.

The first step in executing this initiative was the development of the first DOE Waste Minimization Crosscut Plan, signed by the Secretary in April 1992. This plan provides the framework for effective coordination of DOE waste minimization activities and establishes objectives and strategies. In addition, a new management structure has been put in place to provide a strong institutional mechanism for facilitating program direction, information sharing, cooperation, and resource allocation.

Technology development and applications are critical to waste reduction efforts and are producing beneficial results. For example, Freon has been completely eliminated from depleted uranium machining processes at the Oak Ridge Y-12 Plant, reducing the plant's overall Freon use by 95 percent. At the Kansas City Plant, emissions of chlorofluorocarbons have been reduced from 1988 levels by 60 percent. The Savannah River Site reduced waste generation in five of six categories and received the "Recycler of the Year" Award from the Augusta-Richmond County, Georgia, Clean Community Commission.

Technology Development and Application

DOE's technology development efforts during FY 1991 and FY 1992 addressed specific technology needs to support environmental restoration and waste management objectives and covered a wide range of cost-saving and environmentally significant activities. At the Savannah River Site, for example, ground-penetrating radar and soil gas characterization were used at 40 CERCLA sites to select well locations, leading to an estimated initial savings of $2.4 million and anticipation of additional savings in the well-closure phase. At Fernald, robotic characterization of K-65 silos produced a net savings of approximately $2.3 million while facilitating consent agreement milestone completion. Application of robotic technology also will result in longer-term savings and health and safety benefits through improved efficiency and productivity and through elimination of the need for personnel to work in hazardous environments.

Training and Retraining Personnel

The environmental programs of DOE require highly qualified personnel. Accordingly, EM education programs are designed to deliver the work force needed by DOE. Presently, DOE sponsors 400 students in Waste Education and Research Consortium Programs; 15 have already graduated. DOE academic partnerships with colleges and universities now include more than 8600 students and 80 faculty members working on 27 research tasks. In addition, EM has assisted Native American educational institutions with environmental and waste management curricula and through grants of funds, equipment, and facilities. Finally, precollege and general outreach programs have reached 120,000 students, 2,400 teachers, and 137,000 members of the general public.

As the DOE mission moves further from weapons production to environmental restoration and waste management, plans and programs are being established to train employees who may be affected by changing facility missions. EM will make every attempt to use employees qualified for work on environmental restoration and waste management projects who are presently in the DOE system before hiring from the outside.

The Status of Key Initiatives

EM is pursuing several initiatives considered essential to the success of the DOE environmental restoration and waste management mission. These initiatives include expanding opportunities for public participation; improving relations with States, Indian Tribes, and other Federal agencies; establishing improved cost-management procedures; streamlining enforceable agreement negotiations; updating contracting strategies; conducting internal and external program reviews; and instituting safeguards and security capabilities. The following highlights selected initiatives from each area.

Public Participation

DOE understands the importance of meaningful public participation in its planning processes and has worked to expand efforts in this area. DOE has continued to work closely with two national groups, the State and Tribal Government Working Group (STGWG) and the Stakeholders' Forum, in improving the Five-Year Plan development process. At the local level, DOE encourages public involvement through a number of mechanisms, including working groups, advisory panels, and open meetings to review and discuss various planning documents and activities. For example, at the Fernald Site, the public participation program has been a success due to a number of factors, including frequent public meetings and workshops; the attendance and participation of Fernald representatives at local government and civic meetings; and the use of an advisory group. The newly created Office of Policy and Program Information will help coordinate DOE's many public participation activities. DOE recently produced a Comment Response Document for the FY 1993–1997 Five-Year Plan that contains public comments on the plan and shows how DOE incorporated suggested improvements. This Five-Year Plan will include a third volume that responds to public comments. DOE has also instituted a number of programs to interest and include high school students in its environmental cleanup activities, including a national student review program to improve the readability of the Five-Year Plan and a summer internship that involved development of a student version of the plan.

The DOE American Indian Policy

Many DOE environmental program activities potentially affect Tribal interests. These include site cleanup, waste management, transportation, and education and training. On November 29, 1991, the Secretary announced a comprehensive DOE American Indian Policy to provide guidance for interactions with Indian Tribes. This seven-point policy outlines the principles DOE will follow to ensure that Tribal rights and interests are considered in decision-making processes and activities, including those related to environmental program activities. EM is developing an implementation plan to ensure that DOE policy is followed in all EM activities.

Cost Management and Review

A key element in the DOE cost management initiative is the EM Cost Quality Management Program, under which Cost Quality Management Assessments are being conducted. These assessments use a systems approach to evaluate how DOE sites are performing in cost and schedule estimation and analysis.

The first round of these assessments was completed in March 1992 at 12 sites (Fernald; Los Alamos; the Pantex and Kansas City Plants; the DOE Chicago, Idaho, Nevada, Oak Ridge, Richland, San Francisco, and Savannah River Field Offices; and the Rocky Flats Office). At each site, a multidisciplinary team evaluated cost-estimating and management practices and procedures. These teams made numerous recommendations for improvement that are now being acted upon. DOE Headquarters is conducting further evaluations to identify the root causes of the problems and determine strategies to address them.

Another contributor to innovation in cost management is roadmapping. In planning for and executing environmental restoration and waste management activities at 30 DOE installations, the roadmapping process is used to identify key roadblocks (issues) that could impede progress and lead to the unnecessary expenditure of resources. These issues are then subjected to rigorous analyses, and strategies are developed and implemented to resolve them on a timely basis.

DOE is implementing a comprehensive Progress Tracking System to facilitate cost-efficient management of program activities and resources. The Progress Tracking System is designed to track the status of more than 2000 activities and is projected to be fully operational in FY 1993.

Streamlining Enforceable Agreement Negotiations

DOE and EPA established standard provisions (or "model language") for enforceable environmental compliance agreements in 1988 to smooth the negotiation and timely execution of agreements. Experience with implementing subsequent agreements indicates that some of the model provisions need revision. DOE is working with EPA to develop provisions for DOE funding to support agreements, for specific criteria EPA will apply to determine when to assess penalties for noncompliance in CERCLA agreements, and for informal dispute resolution procedures addressing potential compliance problems before a violation occurs.

Updating Contracting Strategies

DOE believes that the increasing emphasis on environmental restoration work requires new approaches to get the job done. One approach being investigated is use of Environmental Restoration Management Contractors. Two sites, Fernald and Hanford, have been chosen as pilot sites for this approach. The Environmental Restoration Management Contractors will be chosen not only for project management capabilities but also for experience in environmental restoration activities such as Superfund cleanup operations. The ERMC at Fernald, Fluor Daniel Corporation, was selected in August 1992.

Internal and External Program Review

DOE, in conjunction with EPA, the Justice Department, the Office of Management and Budget, the Department of Defense, and the U.S. Army Corps of Engineers, completed the most intensive review of the EM program ever undertaken. The study, referred to as the Interagency Review Group Report, analyzed the level of funding needed in FY 1993 to meet legal requirements in the cleanup of DOE facilities. The report also made a number of recommendations aimed at correcting deficiencies in the program. In part, some of the DOE initiatives discussed above were launched in response to the report's recommendations.

Safeguards and Security Capabilities

EM is focusing on safeguards and security practices at EM facilities, particularly with its increased responsibilities for landlord activities and facility transition. To meet these responsibilities, EM

established a Safeguards and Security staff in January 1992 and is developing a facility safeguards and security concept to concentrate classified assets in defined areas at each facility. The Hanford Site has taken the lead in developing the concept and has prepared a plan to consolidate special nuclear material and classified material in specific buildings. EM will monitor implementation of the Hanford consolidation plan and determine whether the concept is applicable to other installations.

Organization of Plan

The FY 1994–1998 Five-Year Plan is organized around the following key crosscutting objectives from the Environmental Restoration and Waste Management Strategic Plan:

- **Credible Decision Making**

  Improve the credibility and effectiveness of DOE decision making through an integrated, documented planning process that incorporates anticipated land-use decisions and includes significant opportunities for public participation.

- **Facility Transition, Acceptance, Deactivation, and Disposition of Surplus Facilities**

  Recycle, transfer, convert, decontaminate, and decommission facilities and sites to accommodate the rapidly changing mission and priorities of DOE.

- **Elimination of Unacceptable Risk**

  Clean up and operate all active and inactive DOE sites to ensure that unacceptable risks (i.e., risks that endanger worker and public health and safety or the environment) are not imposed on the environment or people.

- **Achievement of Regulatory Compliance**

  Bring all DOE facilities and sites into, and operate them in compliance with, applicable laws, regulations, and agreements aimed at protecting public health, worker safety, and the environment.

- **Prevention of Pollution at its Source**

  Build pollution prevention, including waste minimization, recycling, and reuse of materials, into all DOE activities.

- **Development of Human Resources and Capital Assets**

  Ensure sufficient infrastructure to fulfill the environmental responsibilities of DOE by effectively estimating, developing, and providing the required human resources and capital assets.

- **Efficient Use of Resources: Maximum Possible Compliance and Cleanup Results from Dollars and Time Invested**

  Aggressively pursue innovative approaches to the development, acquisition, and management of resources by (1) emphasizing development and implementation of new technologies,

(2) streamlining the environmental restoration process through a bias for action, (3) improving the cost-estimation system, and (4) implementing enhanced project management and a control system to monitor the progress and results of all activities.

- **Assurance of Public and Worker Safety and Health**

  Contribute to ensuring the safety and health of the public and those who work in DOE facilities through diligent application of the Secretary's Ten-Point Initiative (June 27, 1989) at all levels in all EM activities and compliance with DOE Safety and Health Orders and industry standards.

The EM Five-Year Plan for FY 1994–1998 describes strategies and activities designed to achieve these objectives. Notably, the structure of this Five-Year Plan has evolved from that of the Five-Year Plans that preceded it. In response to the suggestions of STGWG and other stakeholders interested in the environmental mission of DOE, EM modified the Five-Year Plan format to make it more informative and accessible to the general public. Also consistent with STGWG and stakeholder suggestions, this plan is designed to (1) clearly show program progress in terms of success in meeting—or failing to meet—previous commitments and (2) frankly describe the challenges ahead and the strategies selected by DOE to meet them.

The Five-Year Plan is presented in three volumes. The first volume contains in Part 1 a discussion of environmental restoration and waste management activities at a broad, strategic level and in Part 2 a more detailed discussion of EM's five major programs: Waste Management and Corrective Activities; Environmental Restoration; Facility Transition, Acceptance, Deactivation, and Disposition; Technology Development; and Transportation Management. These two parts are followed by several reference appendices, including the Environmental Restoration and Waste Management Strategic Plan. The second volume contains Installation Summaries. The third volume, to be published in the Spring of 1993, will contain a detailed discussion of all comments received during the public comment period on the preliminary plan (Volumes I and II). Notably, the publishing of both preliminary and final versions of the FY 1994–1998 Five-Year Plan is responsive to the requirements of Section 3135 of the National Defense Authorization Act for Fiscal Years 1992 and 1993.

PART 1

DOE FIVE-YEAR PLAN FOR ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT

1.0 A READER'S GUIDE TO THE FIVE-YEAR PLAN

The FY 1994–1998 Five-Year Plan builds on its predecessors and focuses on concrete objectives in support of Department of Energy environmental goals.

The Environmental Restoration and Waste Management Five-Year Plan for FY 1994–1998 is the primary Department of Energy (DOE) planning document for its environmental restoration and waste management activities. It captures the results of a comprehensive annual planning process that involves the DOE Office of Environmental Restoration and Waste Management (EM), various external parties, and the general public. This plan is updated on an annual basis in accordance with provisions of the National Defense Authorization Act for FY 1992 and 1993.

The Five-Year Plan is used to inform Federal, State, Tribal, and local governments and the public of near-term DOE plans for managing its waste and cleaning up contaminated sites, facilities, and the environment. The plan draws from the Strategic Plan for Environmental Restoration and Waste Management, which outlines the mission, vision, issues, and strategies for accomplishing DOE environmental goals. A copy of the Strategic Plan is included in Appendix C of this document. The Five-Year Plan discusses EM commitments, accomplishments, and setbacks and is augmented by site-by-site summaries that outline the accomplishments and setbacks for each site.

The FY 1994–1998 Five-Year Plan is designed to build on the three previous Five-Year Plans. Duplication of previously published information has been avoided as much as possible. Consequently, the plan does not include program definitions, detailed organization descriptions, or background discussions. The size and format of this Five-Year Plan were influenced by public comments received on previous plans. A number of readers noted that the sheer bulk of previous plans reduced their usefulness. As a result, this Five-Year Plan is more focused on crosscutting objectives, major initiatives, and progress made during the past year.

Five-Year Plan Structure

The Five-Year Plan follows a broad-to-narrow, general-to-specific approach. Volume I has two parts. The discussion of DOE environmental restoration and waste management activities begins at a broad, strategic level (Part 1), followed by a detailed discussion of DOE program activities (Part 2).

Future milestones, major accomplishments, and setbacks are found in Part 1 (Section 1.2). The Five-Year Plan addresses major issues and trends (Section 1.3) and highlights initiatives identified in the FY 1993–1997 Five-Year Plan (Section 1.4). The plan then focuses on resource planning (Section 1.5) and on the major program objectives (Section 1.6), such as waste minimization. Throughout, it addresses congressional specifications articulated in the National Defense Authorization Act for FY 1992 and 1993.

Part 2 of Volume I is organized around the activities, milestones, and strategies of the five major EM programs: Waste Management and Corrective Activities; Environmental Restoration (including decontamination and decommissioning); Facility Transition, Acceptance, Deactivation and Disposition; Technology Development; and Transportation Management. Progress made in FY 1991 and FY 1992, the problems that DOE still faces, and the strategies adopted to confront and solve those problems are outlined for each program.

Appendices provide backup information to the FY 1994–1998 Five-Year Plan and include:

A. National Defense Authorization Act for Fiscal Years 1992 and 1993, Section 3135;

B. How DOE is Organized;

C. Strategic Plan for Environmental Restoration and Waste Management;

D. DOE Sites and Facilities with Environmental Restoration and Waste Management Responsibilities;

E. DOE Public Reading Rooms;

F. Compliance Agreements, Consent Decrees, and Agreements-in-Principle;

G. Planning Estimates by Activity Data Sheet;

H. Federal Pollution Abatement Plan (A-106) Relationship to EM-ADSs;

I. Planning Process and Documents List;

J. State and Tribal Government Working Group Comments on December 1992 Predecisional Draft and State and Tribal Government Working Group and Stakeholders' Forum Comments on the May 1992 Predecisional Draft; and

K. List of References.

Volume I ends with a glossary; acronyms appear inside the back cover of Volume I.

Volume II of the FY 1994–1998 Five-Year Plan contains a summary of DOE activities at the installation level and site-by-site discussion of cleanup strategies and milestones. For each installation summary, a strategic outlook section has been added that addresses the installation's long-term strategies for achieving major assessment, cleanup, compliance, and technology development goals. Also new to this plan is the ability to track milestones against those that appeared in previous plans.

Volume III, results of public comments on Volumes I and II of the plan, will be published following a 60-day public comment period on the preliminary FY 1994–1998 Five-Year Plan. This volume will reproduce and discuss resolution of comments received during the comment period, as required by the National Defense Authorization Act for FY 1992 and 1993.

Congressional Guidelines

On December 5, 1991, the President signed into law the National Defense Authorization Act for FY 1992 and 1993. This Act contained requirements for the EM Five-Year Plan. Figure 1.0a lists these key requirements, along with how DOE has addressed them. Section 3135 of the Act is included in Appendix A. The FY 1994–1998 Five-Year Plan development process and contents were modified to respond to this legislation. While some aspects of the current plan development schedule do not meet the dates specified in the Act, DOE has worked hard to meet the intent of Congress.

The FY 1994–1998 Five-Year Plan development schedule has been affected by significant cost validation reviews conducted during the fall and winter of 1991 by DOE, the U.S. Army Corps of Engineers, and the Office of Management and Budget. These reviews have improved the cost estimates that underlie EM planning efforts. The schedule for the development of the FY 1994–1998 Five-Year Plan also provided for predecisional involvement by the State and Tribal Government Working Group (STGWG) and by the Stakeholders' Forum, which includes representatives from Federal agencies, congressional staff, unions, education groups, industry, and environmental groups.

Congressional Mandates in the National Defense Authorization Act for FY 1992 and 1993	
Key Requirements	**FY 1994–1998 Five-Year Plan**
Content	
• Discuss activities necessary to comply with applicable laws, regulations, and agreements.	• Volume I, Section 1.6.5, Commitment to Regulatory Compliance; Volume II, Installation Summaries.
• Describe EM activities to be conducted in year plan submitted and in fiscal year beginning in October of same year; discuss implementation of preceding Five-Year Plan.	• Volume I, Section 1.2, Accomplishments and Setbacks; Volume I, Section 1.4, Status of Initiatives; Volume II, Installation Summaries.
• Discuss actions for environmental restoration activities, including research and development and technologies and facilities.	• Volume I, Sections 2.2.0-2.2.6, Environmental Restoration. • Volume I, Sections 2.4.0.-2.4.7, Technology Development.
• Discuss waste management activities, including waste minimization and decontamination and decommissioning, research and development and waste management technologies.	• Volume I, Sections 2.1.0 EM's Waste Management Program; Sections 2.3.0-2.3.4, Facility Transition, Acceptance, Deactivation, and Disposition for discussion of decontamination and decommissioning; Sections 2.4.0 - 2.4.7, Technology Development.
• Final plan must describe how it differs from preliminary plan and reasons for difference.	• Volume III will address differences.
Funding	
• Provide estimated costs and personnel for planning period.	• Volume I, Section 1.5 Resource Planning; Volume II, Installation Summaries, Individual Activity Data Sheets.
• Discuss need for contingency fund.	• Volume 1, Section 1.3, Issues and Trends.
Process and Schedule	
• Preliminary plan issued four months prior to final plan submitted to States, Tribes, and the public.	• Predecisional draft provided to STGWG in December 1992 and predecisional draft provided to STGWG and Stakeholders' Forum, May 1992. Preliminary plan published January 1993, with *Federal Register Notice* announcing public comment period.
• Final plan published September 1,1992, and submitted to President, Congress, States, and Tribes.	• Final plan published late spring 1993 with *Federal Register Notice.*
• All comments on preliminary plan from the Environmental Protection Agency, States, Tribes, and summary of public comments included as appendix to final plan.	• Public comment on preliminary plan discussed in final plan.

Figure 1.0a. The FY 1994–1998 Five-Year Plan and the process of developing it responds to new Congressional mandates contained in the National Defense Authorization Act for FY 1992 and 1993.

Release of the FY 1994-1998 Five-Year Plan was delayed due to cost reviews, prolonged interagency review, and other unforeseen events. The Department will continue to strive to meet the requirements of the Defense Authorization Act.

How The FY 1994-1998 Five-Year Plan Was Developed

The Five-Year Plan is the most visible product of a year-long integrated planning process that is the foundation for program decision making. This process has three main elements—strategic planning, program planning, and installation planning—that culminate each year in the Five-Year Plan (Figure 1.0b). Integration of the Strategic and Five-Year Plans is accomplished through relating long-term goals and objectives to near-term program proposals. The results of this process yield the DOE vision of the future, the organization's overall mission, and specific goals and objectives against which program progress can be gauged. The planning process also identifies strategies for overcoming obstacles (e.g., infrastructure constraints) that might impede program success.

Strategic planning is augmented by program planning that transforms DOE goals and strategies into detailed plans for each environmental restoration and waste management project. Activity Data Sheets (ADSs) provide project-level information about the scope of work, priority, funding levels, and regulatory drivers. These ADSs emphasize risk reduction and compliance with Interagency Agreements and applicable environmental statutes and regulations.

The detailed, project-specific information contained in the ADSs is summarized in two sets of documents that link the ADSs to the Five-Year Plan and EM goals and objectives—Installation Summaries and Site-Specific Plans. Installation Summaries specify activities and milestones at the facility or site level. These summaries are presented in Volume II of this Five-Year Plan. Site-Specific Plans are developed by individual sites to present detailed plans for activities at each installation, with emphasis on plans for the upcoming fiscal year. A further discussion of Site-Specific Plans and their function in the EM integrated planning process is included in Appendix I.

Roadmaps, which are developed at the installation level, are detailed analyses of issues that affect DOE's ability to achieve long-term goals. While strategic planning is generally top-down in orientation and relatively general in focus, roadmapping approaches long-range planning from the bottom up. Accordingly, roadmapping identifies the root causes of and detailed steps to resolve significant issues. Issues identified during the roadmapping inform the strategic planning process and the development of ADSs.

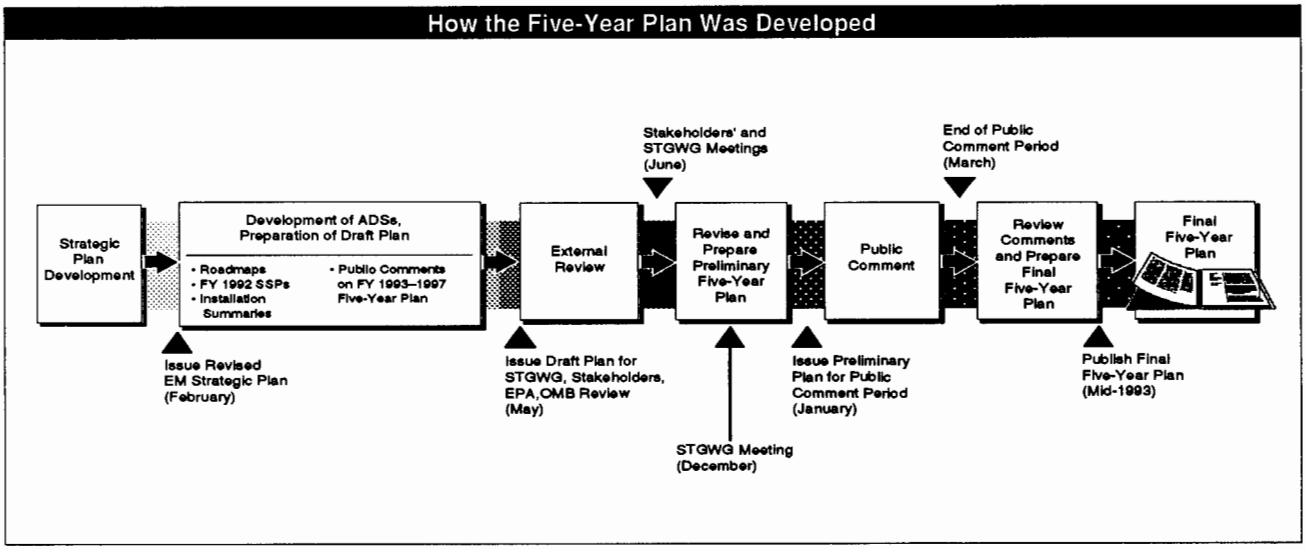


Figure 1.0b. The Five-Year Plan is the most visible product of a year-long integrated planning process that is the foundation for program decisions.

Public Participation

The FY 1994–1998 Five-Year Plan was also shaped by comments on the FY 1993–1997 Five-Year Plan provided by stakeholders and the public. Thirty-three sources formally commented on the FY 1993–1997 Five-Year Plan, providing 167 separate comments. These comments and DOE's responses are included in a separate Comment Response Document.

In June, two formal review groups, STGWG and the Stakeholders' Forum, held separate meetings to discuss with DOE the predecisional draft of the FY 1994–1998 Five-Year Plan. Overall, STGWG and stakeholder comments were favorable, with both groups noting significant improvements over the FY 1993–1997 Five-Year Plan. However, there were also several comments on the need for improvement or further clarification. Issues noted included the organization and structure of the plan, worker health and safety, education and training, public involvement, cost estimates, research and technology development, facility transition, land-use planning, risk-based management, waste management, waste minimization, and site-specific issues. In December, STGWG provided further comments on the December predecisional draft.

Based on STGWG and stakeholder comments, the draft Five-Year Plan has been significantly revised. Where comments expressed the need for more information, the relevant sections of the plan were revised and expanded. For example, a number of comments noted that the information presented in the Installation Summaries was unclear. In response, DOE revised each summary to ensure that the data were accurate, up to date, and easy to understand. Also as a result of STGWG and stakeholder comments, DOE clarified confusing graphics used in the plan. For a more detailed discussion of STGWG and Stakeholders' Forum comments and DOE responses to them, see Appendix J.

From format to the handling of major policy issues, this plan was heavily influenced by thoughtful and helpful comments received throughout the planning process. In addition, public participation efforts across the DOE complex solicited input for the Five-Year Plan development process. These public participation initiatives are discussed in Section 1.6.2. Figure 1.0b demonstrates the steps involved in developing the FY 1994–1998 Five-Year Plan.

1.1 EM MISSION, VISION, AND OBJECTIVES

The DOE environmental vision and mission are based on operating all facilities in full compliance with applicable laws and regulations and cleaning up inactive sites and facilities so that no unacceptable risk to the public or the environment remains.

DOE is responsible for waste management and cleanup of more than 100 contaminated installations in 36 States and territories (Figure 1.1a and Appendix D). In 1989, in an effort to resolve conflicts between DOE's defense production and environmental goals at these sites, Secretary of Energy James D. Watkins outlined his vision of a changed DOE culture: one of environmental responsibility, coupled with increased public knowledge and involvement, a new openness, and overall accountability.

The EM organization was formed in response to the Secretary's vision. Consolidation of waste management and environmental restoration activities in the Office of Environmental Restoration and Waste Management reflects a fundamental reprioritization process in which programmatic emphasis on cleanup activities has rapidly increased.

The DOE mission for environmental restoration and waste management is to:

- safely manage the generation, handling, treatment, storage, transportation, and disposal of DOE waste and
- ensure that risks to the environment and human health and safety posed by inactive and surplus facilities and sites are either eliminated or reduced to prescribed, safe levels.

EM carries out this mission by using the most technically efficient and cost-effective means possible, while providing multiple opportunities for public participation and involvement.

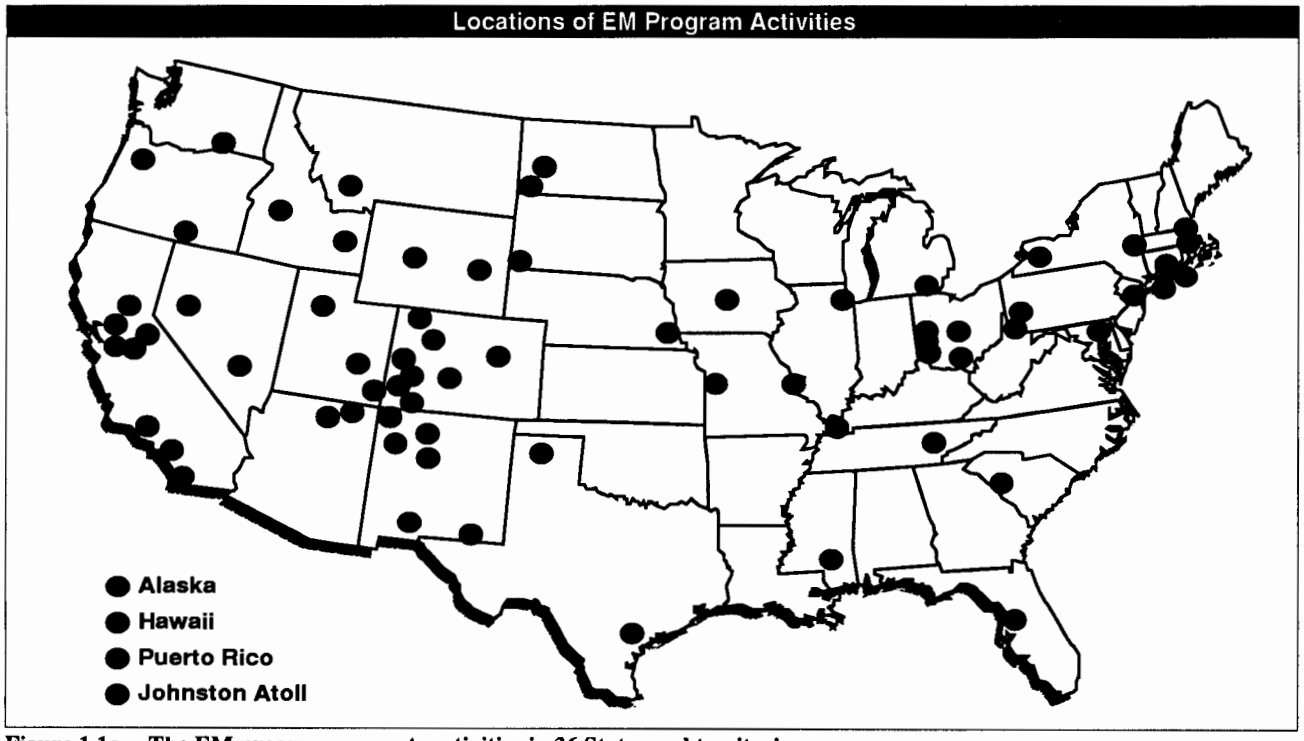


Figure 1.1a. The EM program supports activities in 36 States and territories.

Vision of the Future—The Year 2019

In 1989, DOE set a 30-year goal to clean up and restore the environment at its nuclear sites through sustained excellence in the performance of environmental restoration, waste operations, and transportation of DOE wastes, all supported by state-of-the-art, cost-effective, cradle-to-grave technology and paced by comprehensive land-use planning. Specifically, the DOE vision of the year 2019 is as follows.

- All DOE operations will be conducted in compliance with all applicable requirements. This will be accomplished by maximum recycling and reuse of materials and facilities, minimum generation of hazardous and radioactive waste, environmentally sound waste treatment and management, and minimum releases to the environment.
- The inventory of DOE surplus facilities and inactive sites will pose no unacceptable risk to public health, safety, and the environment.

> By the year 2019, all DOE operations will be in full compliance, and the risk to the public and the environment from inactive sites will be reduced to acceptable levels.

These fundamental goals remain unchanged, as does the desire to achieve public trust earned by appropriate and effective action. However, the job to be done has grown with recent dramatic world changes. With the shift in the DOE defense mission, a large number of new sites and facilities will be added to the inventory of surplus facilities and inactive sites during the next 20 to 30 years—a responsibility that was not envisioned in 1989. While the initial 30-year environmental goal has been retained, DOE established an additional goal to reflect this changing mission:

- Decontamination and decommissioning, remediation, recycling, and conversion of sites and facilities declared surplus or inactive after 1989 will either be completed by 2019 or will be proceeding safely and according to a well-defined and nationally accepted schedule.

National Planning Chart

Figure 1.1b illustrates the major activities undertaken to accomplish DOE environmental goals during the next 27 years, as well as those activities that will continue beyond 2019. This chart is a conceptual representation of the early emphasis on achieving compliance, stabilizing and controlling environmental problems, reducing near-term risk, and initiating efforts leading to long-term or permanent solutions to waste treatment/disposal and environmental remediation.

Figure 1.1b is designed to show in broad, conceptual terms the expansion and contraction of environmental restoration and waste management activities over time. It shows the processes that comprise the EM mission, from corrective activities to waste disposal and postclosure monitoring. Environmental restoration programs are under way at all 35 major EM installations, as well as sites under the jurisdiction of the Uranium Mill Tailings Remedial Action Project and the Formerly Utilized Sites Remedial Action Program. Also illustrated are the deactivation and disposition processes in which surplus facilities are transferred to EM. These restoration and decommissioning activities produce waste that requires treatment and disposal, along with the waste that is stored and the waste from ongoing nuclear weapons production and other DOE research and development operations. All cleanup and waste management activities shown on the chart will benefit from the application of new technology.

The National Planning Chart reflects the 30-year goals of cleaning up inactive waste sites. It also reflects EM plans to have comprehensive treatment, storage, and disposal facilities in operation for all its waste streams by 2019. The chart illustrates that waste management activities will continue beyond 2019, as will postclosure monitoring of remediated sites in compliance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and deactivation and disposition of surplus facilities transferred to EM in accordance with schedules established at the time of facility transfer.

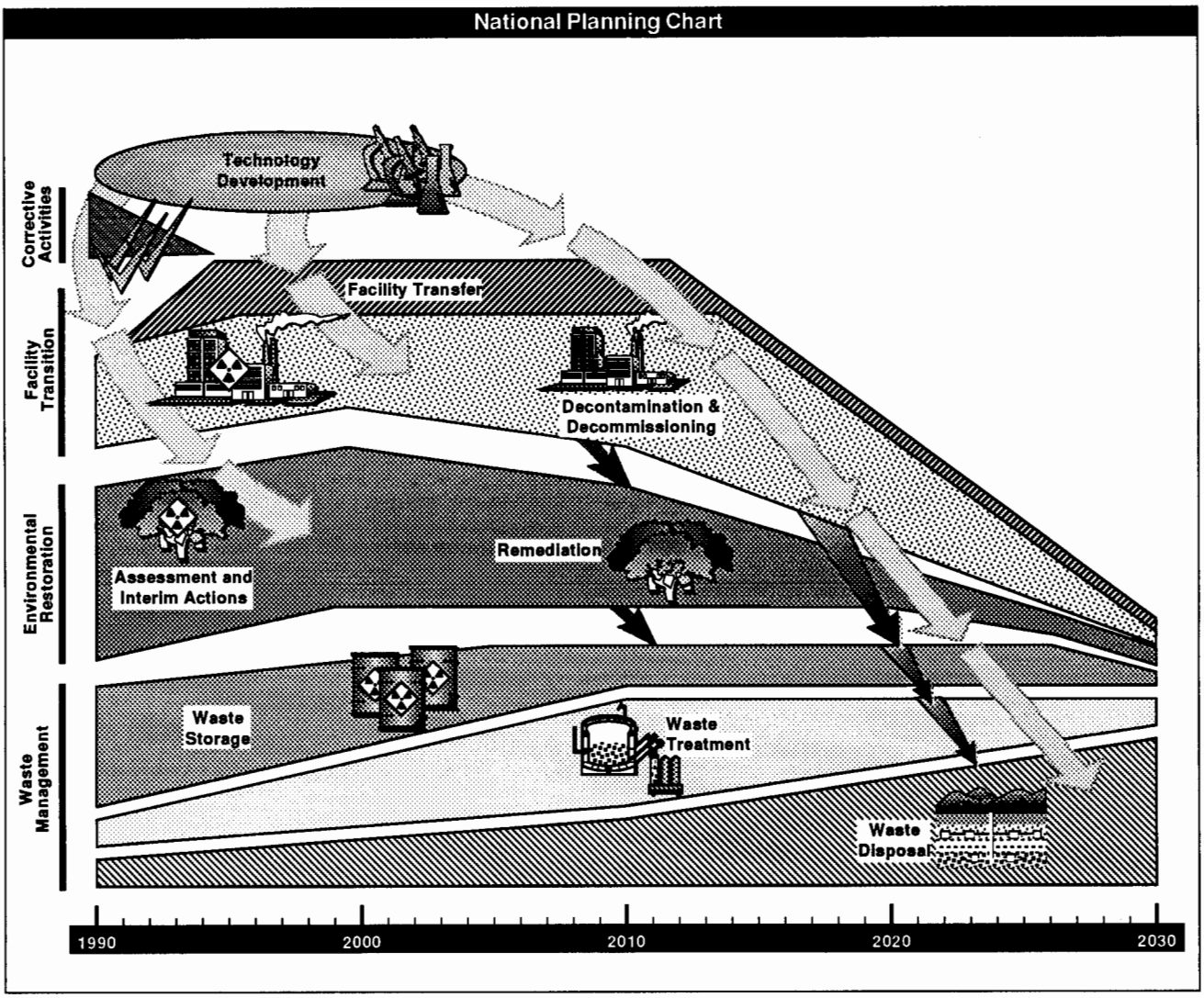


Figure 1.1b. This chart shows (1) flow of new technologies to environmental restoration and waste management activities, (2) completion of corrective activities, (3) facility transition, (4) decontamination and decommissioning, (5) phasing of environmental restoration activities from assessment to remediation and postclosure monitoring, and (6) phasing of waste management activities from storage to treatment to disposal.

DOE Objectives for Environmental Restoration and Waste Management

As part of its strategic and operational planning processes, EM has identified several objectives designed to lead to achievement of its long-range environmental goals. These objectives consist of two basic types: major crosscutting objectives and near-term program objectives. These objectives provide a more definitive framework for the EM program and enable the reader to evaluate strategies for and progress toward meeting its ultimate goals.

Crosscutting Objectives

The DOE strategic planning process includes identification of specific objectives to be accomplished by 2019. These objectives provide a basis for analyzing issues and obstacles toward achieving the objectives and strategies for addressing them. Eight major crosscutting objectives have been established for environmental restoration and waste management:

- **Credible Decision Making through Sound Planning and Public Participation**

  Improve the credibility and effectiveness of DOE decision making through an integrated, documented planning process that incorporates anticipated land-use decisions and significant opportunities for public involvement.

- **Facility Transfer, Conversion, and Decommissioning**

  Recycle, transfer, convert, decontaminate, and decommission facilities and sites to accommodate the rapidly changing DOE mission and priorities.

- **Elimination of Unacceptable Risk**

  Clean up all surplus facilities and inactive sites and treat, store, and dispose of hazardous, radioactive, and mixed waste so that no unacceptable risk to the environment, public health, and worker safety remains.

- **Regulatory Compliance**

  Bring all DOE facilities and sites into, and operate them in, compliance with applicable laws, regulations, and agreements aimed at protecting public health, worker safety, and the environment.

- **Pollution Prevention**

  Build pollution prevention, including waste minimization, recycling, and reuse of materials, into all DOE activities.

- **Infrastructure**

  Ensure sufficient infrastructure to complete the EM mission by effectively estimating, developing, and satisfying the program's human resource and capital asset requirements.

- **Efficient Use of Resources**

  Aggressively pursue innovative approaches to develop, acquire, and manage resources.

- **Assurance of Public and Worker Safety and Health**

  Contribute to ensuring the safety and health of the public and those who work in DOE facilities.

These objectives are presented in more detail in Section 1.6.

EM and the National Energy Strategy

EM is an integral part of the DOE National Energy Strategy. The EM mission directly and indirectly supports four National Energy Strategy objectives: energy security, economic growth, science and technology, and most importantly, enhanced environmental quality.

The most obvious and direct EM contribution is to enhance environmental quality, but it can and does make significant contributions in other areas. For example, many of the innovative technology, energy, and material conversion approaches to process and facility design and operation are partially or wholly applicable to other DOE and private sector enterprises. Similarly, the body of waste minimization and risk assessment knowledge that EM is building will be invaluable to others tackling similar problems.

Planning Assumptions

DOE plans to achieve near-term objectives and long-range goals are encompassed in the Strategic Plan, program-specific plans, and this Five-Year Plan. These documents address specific strategies and milestones leading to program accomplishments, as well as assumptions on which the plans are based. Planning assumptions address factors, which cannot be well-defined at this time, that influence the ability of DOE to accomplish its mission. Assumptions regarding how these factors are expected to influence the program help program managers plan for environmental restoration and waste management activities. These planning assumptions include the following:

- The scope of EM programs will continue to expand as the DOE complex is downsized and reconfigured.
- Local, regional, or national strategies for treatment, storage, and disposal facilities will be based on the Record of Decision of the EM Programmatic Environmental Impact Statement to be issued in FY 1993.
- Retraining of workers no longer required to support DOE weapons activities will satisfy a significant part of EM demand for people to accomplish its mission.
- Technology development and implementation efforts in progress will provide solutions to currently intractable waste management and environmental restoration problems.
- The generation of waste from DOE operations will decrease as a result of waste avoidance and minimization, application of new technology, and changes in the DOE defense mission. Waste projections from environmental restoration activities will remain uncertain for the next five to ten years.
- Decontamination and decommissioning projects will minimize the need for waste treatment and disposal through efforts to clean up contaminated materials for recycling and through targeting facilities that can be decontaminated and transferred to private sector use.
- Uncertainty in risk assessment procedures will be reduced, and risk management will become a reliable tool accepted by regulatory agencies and the public.
- Inconsistencies in Federal and State regulations and provisions of Federal Facility Agreements will be reduced as valid health risk data are factored into national standards and site-specific remediation objectives.

DOE is working to translate its ultimate 30-year goals into specific objectives that will ensure timely progress. Although the challenge is complex and involves a high degree of uncertainty, DOE is putting the strategies and plans in place to achieve its objectives and to resolve issues that hinder progress. Strategic and operational planning processes are also being improved to enable DOE to more effectively manage changes.

1.2 ACCOMPLISHMENTS AND SETBACKS: MEASURING PROGRESS IN ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT

EM has made progress in reducing the amount of waste generated, improving waste treatment and disposal operations, establishing cleanup agreements with regulators, accelerating cleanup projects, completing site closures, advancing environmental restoration and waste management technologies, and training/retraining personnel. The indefinite delay of the Test Phase at the Waste Isolation Pilot Plant (WIPP), due to an adverse court ruling, was a major setback; however, recent, new legislation placed WIPP back on course.

Tracking key FY 1990–1998 milestones provides a means of assessing progress of the EM program and is part of efforts to operate a professional, cohesive, well-controlled, goal-oriented program. First presented in the FY 1993–1997 Five-Year Plan, the National Progress Chart (Figure 1.2a) uses milestones to depict the overall status of DOE environmental and waste management efforts from FY 1990 through FY 1998. It documents progress to date in critical program areas, new program initiatives since the FY 1993–1997 Five-Year Plan, and slippages. The purpose of the chart is to summarize the overall effort through FY 1998 and to graphically display where efforts have succeeded and where additional attention is required. The National Progress Chart is a summary-level chart and does not record every accomplishment or planned milestone. For detailed information regarding installation-level milestones, please refer to the Installation Summaries and Progress Charts (Volume II).

Major accomplishments relate to treatment of waste, assessment of environmental releases and risks, and development of technologies to support more effective environmental restoration, waste minimization, and waste treatment. The accomplishments are highlighted below. A more detailed list of accomplishments by program is included in Section 2 of this volume and by installation in Volume II of this plan.

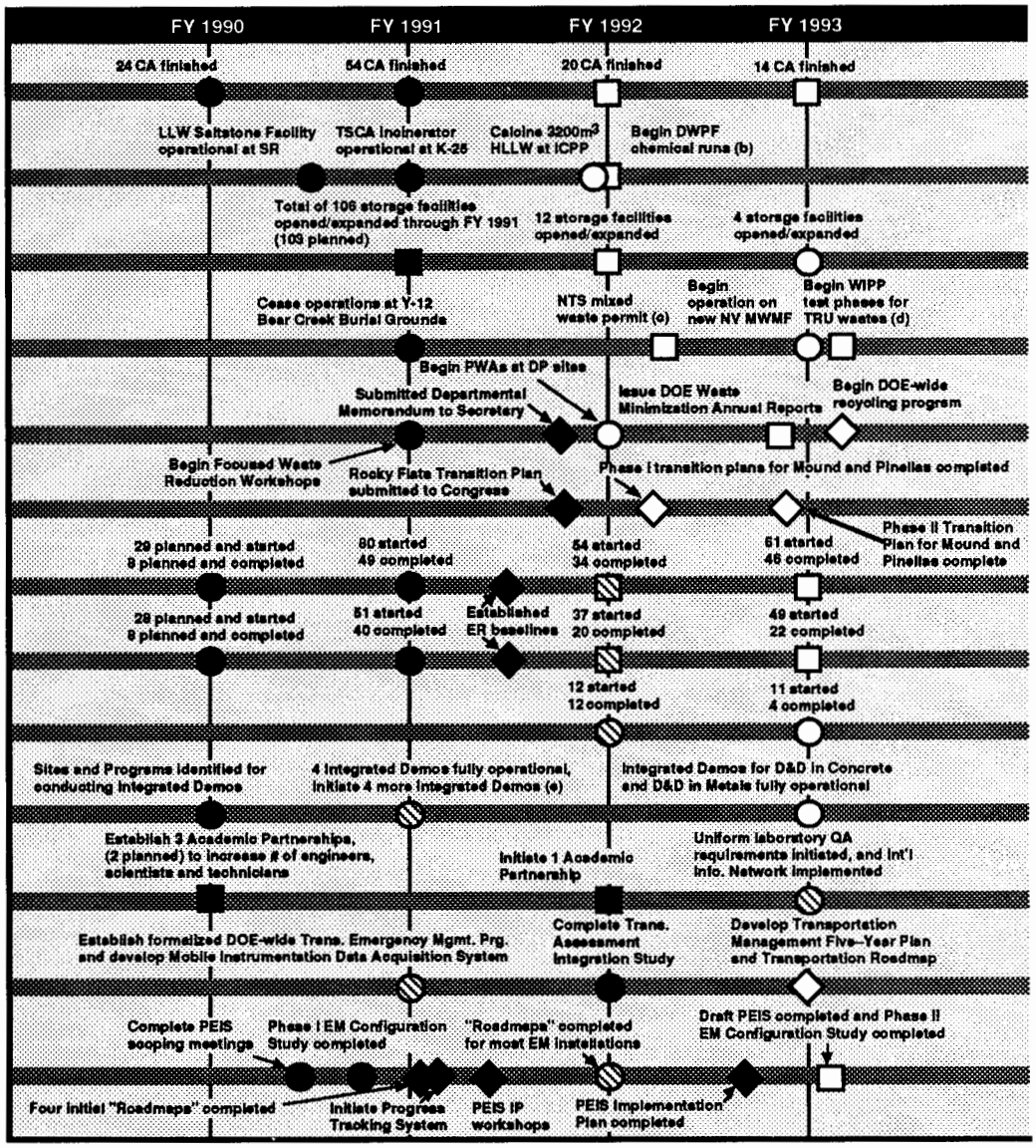
Accomplishments In Environmental Restoration

The National Progress Chart (Figure 1.2a) displays a near-term emphasis on assessing the extent and nature of contamination. Closures and interim remedial actions designed to remove sources of contamination and stabilize sites to reduce near-term risk are also being undertaken. Full remediation will follow assessment efforts, with site monitoring continuing upon completion of the cleanup effort.

In FY 1992, the Environmental Restoration Program redefined its work scope by implementing a project-oriented approach instead of the Field Office/ Installation designations previously employed. Seventeen major environmental restoration projects have been identified by aggregating all environmental restoration activities in a logical manner. These 17 major projects incorporate numerous subprojects, which are further divided into assessment, cleanup, and interim removal activities. The number of assessment, cleanup, and interim removal activities to be started or completed is shown by fiscal year in the National Progress Chart. The number of activities shown on the chart has changed since the FY 1993–1997 Five-Year Plan as a result of program restructuring, in which some smaller projects were consolidated into larger ones and some larger projects were divided into smaller units. Consequently, while the

National Progress Chart for the Environmental

Timeline represents accomplishments at the end of each fiscal year (Federal fiscal year begins on



Legend:

Milestone Types (indicated by shape)

- Unchanged from FY 1993–1997 Five-Year Plan (Milestones explanations above milestones)
- New since FY 1993–1997 Five-Year Plan
- Changed from FY 1993–1997 Five-Year Plan

Milestone Status (indicated by shade)

- Planned
- 50% Completed
- Completed

Notes:

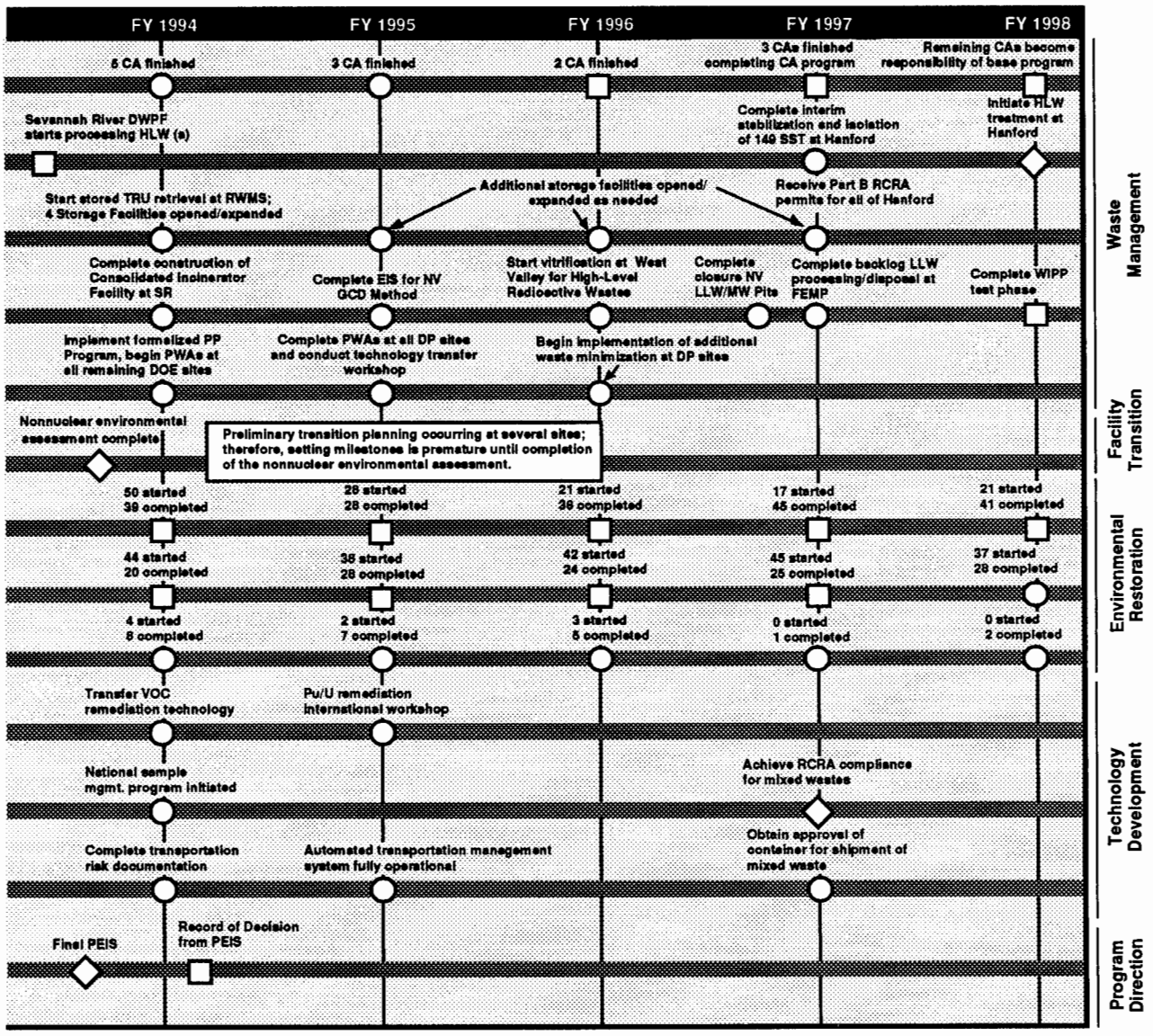
This chart does not identify all activities.
See Installation Summaries for additional information.

(a) Slippage due to problems associated with new technology.
(b) Delayed to resolve major technical issues.
(c) Slippage due to delay in receipt of Nevada approval of LDR waste analysis plan needed for permit.
(d) WIPP schedule delayed by court injunction.
(e) Operational Demos are VOCs in Saturated Soils, Buried Waste, Environmentally Conscious Manufacturing, and Depleted Uranium; Initiated Demos are Cleanup of Plutonium in Soils, Cleanup of Uranium in Soils, Cleanup of VOCs in Unsaturated Soils, and Underground Storage Tank Remediation.

Figure 1.2a.

Restoration and Waste Management Program

October 1 and ends September 30).



Acronyms:

CA = Corrective Activities
D&D = Decontamination and Decommissioning
DP = Defense Programs
DWPF = Defense Waste Processing Facility
EIS = Environmental Impact Statement
FEMP = Fernald Environmental Management Project
GCD = Greater Containment Disposal
HLLW = High-Level Liquid Waste
HLW = High-Level Waste
HWVP = Hanford Waste Vitrification Plant
ICPP = Idaho Chemical Processing Plant
IP = Implementation Plan
LDR = Land Disposal Restrictions
LLW = Low-Level Waste
MW = Mixed Waste
MWMF = Mixed Waste Management Facility
NTS = Nevada Test Site
NV = Nevada
OU = Operable Unit
PEIS = Programmatic Environmental Impact Statement
PP = Pollution Prevention
Pu/U = Plutonium/Uranium
PWA = Process Waste Assessment
QA = Quality Assurance
RDDT& E = Research, Development, Demonstration, Testing and Evaluation
RI/FS = Remedial Investigation/Feasibility Study
RWMS = Radioactive Waste Management Site
SR = Savannah River
SST = Single-Shell Tanks
TI & ED = Technology Integration and Education
TRU = Transuranic
TSCA = Toxic Substances Control Act
UMTRA = Uranium Mill Tailings Remedial Action
VOC = Volatile Organic Compound
WIPP = Waste Isolation Pilot Plant

actual assessment and cleanup work has not changed, accounting for the activities reflected in the National Progress Chart has. These changes are most evident in FY 1992 and FY 1993 and less so in later years. Program restructuring has resulted in a more clearly defined program for which progress can be more readily tracked.

Establishing Cleanup Agreements

Cleanup agreements are an important mechanism to establish a framework for meeting CERCLA requirements and to involve States and the Environmental Protection Agency (EPA) in setting priorities and determining progress. Interagency Agreements were executed at four sites in 1991 and at three more sites as of June 1992. Agreements are now in place for 15 of DOE's 16 sites on the Superfund National Priorities List (Figure 1.2b). An Interagency Agreement was signed for the Rocky Flats Plant on January 22, 1991, establishing the framework for the entire site Environmental Restoration Program. At Fernald, a CERCLA-Amended Consent Agreement was negotiated and signed with EPA on September 14, 1991. Interagency Agreements were signed for Maywood and Wayne sites on September 17, 1991. A Federal Facility Agreement and Consent Order was completed and signed on December 9, 1991, for the Idaho National Engineering Laboratory. This Agreement replaces an earlier Consent Order and Compliance Agreement that addressed only RCRA hazardous wastes. Interagency Agreements were also signed for the Oak Ridge Reservation on January 1, 1992, and for the Weldon Spring Site on January 28, 1992. At Brookhaven National Laboratory, a CERCLA Federal Facility Agreement was signed by DOE, EPA, and the State of New York on May 27, 1992. The Lawrence Livermore National Laboratory (Site 300) Agreement was signed on June 29, 1992, and an Interagency Agreement at the Savannah River Site is expected to be completed in early 1993.

In addition to establishing cleanup agreements, DOE is working closely with EPA and selected States to establish cleanup standards, to streamline negotiating processes, and to establish compliance strategies for mixed waste. These efforts are discussed further in Section 1.6.5. A complete listing of cleanup agreements is provided in Appendix F.

Accelerating Cleanup

Accelerating cleanup, when effective remediation technologies are available, minimizes further spread of contaminants into the environment and makes land available for other uses sooner, thus saving money. DOE is working to adopt strategies recently recommended by EPA to streamline the remediation assessment and decision processes. Strategies being evaluated at DOE sites include early screening of contaminated locations to determine appropriate actions (e.g., further assessment, potential interim action, or complete remedial investigation and feasibility study) and early removal of contaminant sources to limit the spread of contamination. In addition, needs-driven technology development activities are focused on improving the early characterization and assessment phase of the remedial process.

Steps have already been taken to accelerate major cleanup projects. For example, at the Idaho National Engineering Laboratory, procurement is in progress to initiate cleanup of buried transuranic-contaminated waste nearly six years ahead of schedule. This is the first step in the site's most complex cleanup challenge.

Completing Site Closures

As shown in the National Progress Chart (Figure 1.2a), EM scheduled approximately 50 interim actions and closures of mixed waste sites, seepage basins, and settling basins throughout the United States for FY 1992. At the Savannah River Site, the 58-acre Mixed Waste Management Facility was closed and certified by the South Carolina Department of Health and Environmental Control. This represents the largest mixed waste site closure in the United States through FY 1991. The M-Area Settling Basin was closed, and the adjacent Carolina Bay was restored. Another seven seepage basins, totalling 22 acres, were closed at the

Department of Energy Facilities on the National Priorities List			
Site Name	State	Date Listed In Federal Register	Agreement Status
Maywood Site [1]	New Jersey	09/08/83	Signed
Wayne Site [1]	New Jersey	09/21/84	Signed
Monticello Vicinity Properties	Utah	06/10/86	Signed
Lawrence Livermore National Laboratory - Main Site	California	07/22/87	Signed
Weldon Spring Quarry and Feed Materials Plant and Raffinate Pits	Missourri	07/22/87 03/13/89 [2]	Signed
Hanford Site (four separate sites)	Washington	10/04/89	Signed
Rocky Flats Plant	Colorado	10/04/89	Signed
St. Louis Site [1]	Missouri	10/04/89	Signed
Monticello Millsite	Utah	11/21/89	Signed
Brookhaven National Laboratory	New York	11/21/89	Signed
Fernald Environmental Management Project [3]	Ohio	11/21/89	Signed
Idaho National Engineering Laboratory	Idaho	11/21/89	Signed
Mound Plant	Ohio	11/21/89	Signed
Oak Ridge Reservation	Tennessee	11/21/89	Signed
Savannah River Site	South Carolina	11/21/89	Draft
Lawrence Livermore National Laboratory - Site 300	California	08/30/90	Signed

[1] Wayne, Maywood and parts of the St. Louis Site were not owned or operated by DOE or its predecessor agencies; Congress directed DOE to remediate these sites.
[2] The Feed Materials Plant and the Raffinate Pits area were added to the site 3/13/89.
[3] Formerly known as Feed Materials Production Center.

Figure 1.2b.

Savannah River Site. Five removal actions were completed at Fernald, including the removal of water from the K-65 Decant Sump Tank and installation of bentonite in the K-65 silos. Cleanup at the Albany Research Center in Oregon was completed. Seven RCRA sites at the Oak Ridge Y-12 Plant have been certified closed by the Tennessee Department of Environment and Conservation—the first RCRA sites to be certified closed in Oak Ridge. Rocky Flats completed cleanup of polychlorinated biphenyl contamination in a production building.

The Grand Junction Projects Office cleaned up 224 vicinity properties during FY 1991 under the Uranium Mill Tailing Remedial Action Project. During FY 1991, cleanup of contaminated vicinity properties was completed at an additional 51 locations in Lowman, Idaho; Rifle and Gunnison, Colorado; Mexican Hat, Utah; and Monument Valley, Arizona.

Accomplishments in Waste Management

In the Waste Management Program, DOE is focusing on ensuring adequate, permitted storage capacity for existing waste and on minimizing the generation of new waste. At the same time, DOE is constructing and testing facilities for treatment and disposal of mixed waste that are the first of their kind. Many facilities 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 and for new technology development.

Reducing Waste Generation

Waste minimization programs have begun to reduce the volume and toxicity of DOE waste generation. As stated in the FY 1993–1997 Five-Year Plan, EM believes that avoiding waste generation and reducing the hazards of waste generated are the smartest improvements that can be made by DOE. To emphasize the goal of waste avoidance, all sites are required to prepare waste minimization plans and report annually on waste minimization progress.

There are many examples of waste minimization programs across the DOE complex. Since beginning its waste minimization awards program in 1986, Oak Ridge has avoided $88 million in disposal costs and achieved a 60-percent reduction in low-level waste generation. The Savannah River Site has reduced waste generation in four of five categories; only high-level waste increased due to an increase in production. The Savannah River Site received the "Recycler of the Year" award from the Augusta-Richmond County, Georgia, Clean Community Commission.

Savannah River Site Waste Avoidance FY 1990 to FY 1991

Waste Stream	Reduction
Transuranic	48%
Mixed	96%
Hazardous	58%
Low-Level Radioactive	13%

The Idaho National Engineering Laboratory has begun a major recycling effort and in 1991 recycled more than 300 tons of RCRA waste, solvents, office paper, and metal scrap. In addition, the generation of 2100 tons of hazardous, low-level, and mixed waste was avoided. At Los Alamos National Laboratory, replacement chemicals for trichloroethylene in solvent extraction procedures have been developed and used. Based on these proven successes, a new milestone to begin DOE-wide recycling in FY 1994 has been added to the National Progress Chart.

Improving Waste Treatment and Disposal Operations

In addition to its waste minimization efforts, the Waste Management Program is focusing on safe, permitted treatment, storage, and disposal facilities to handle existing and future waste generation. For example, Oak Ridge used a commercial incinerator and supercompactor to achieve an 800-to-1 volume reduction on 16,000 cubic feet of low-level waste. The Toxic Substances Control Act Incinerator at the Oak Ridge K-25 Site treated 2.1 million pounds of waste. The Idaho National Engineering Laboratory completed construction of the Liquid Effluent Treatment and Disposal Facility that is designed to eliminate all radioactive discharges at the Idaho Chemical Processing Plant. This plant also converted more than 150,000 gallons of high-level liquid waste to solid calcine. The Fernald facility shipped 43,500 drums of waste to the Nevada Test Site for disposal, exceeding the FY 1991 goal by 17.5 percent.

Waste Isolation Pilot Plant

On October 30, 1992, Congress passed, and the President signed into law, the WIPP Land Withdrawal Act (PL 102-579). The law withdraws public lands for WIPP use and establishes a new

regulatory framework for WIPP involving regulatory oversight by EPA and other Federal agencies. The new law contains numerous provisions that must be met prior to commencement of WIPP's Test Phase and Disposal Phase. Assuming all the law's Test Phase prerequisites are met, the earliest date DOE could begin the first Test Phase shipments is August 1993.

Establishing the High-Level Tank Waste Remediation System

The Tank Waste Remediation System was established to ensure an integrated approach to management of high-level wastes at the Hanford Site, including the resolution of safety issues associated with high-level waste storage. A safety analysis report format and content guide, comprehensive review plan, and risk assessment guidelines have been developed to provide the guidance for reviewing and updating safety documentation associated with high-level waste storage facilities. A comprehensive review of high-level waste storage at the Hanford Site, Savannah River Site, and the Idaho National Engineering Laboratory was completed to ensure that all significant safety issues have been identified and that plans can be put in place for their resolution.

Substantial progress has been made toward the mitigation of hydrogen generation within Tank 101-SY at the Hanford Site. For example, a number of ventilation upgrades have been completed, and understanding of the waste characteristics has been significantly advanced with the collection and analysis of two core samples. Major accomplishments of the ferrocyanide program include installation and repair of single point temperature monitoring in all 24 single-shell ferrocyanide tanks, sampling vapor space in Tanks 104-BY and 112-C, and obtaining the first core sample from Tank 112-C

Accomplishments in Technology Development, Education, and Training

Advancing Environmental Restoration and Waste Management Technologies

A primary DOE mission is to deliver better, faster, safer, and cheaper technologies for carrying out environmental restoration and waste management. Technology development support is designed to ensure that new technologies are available as the environmental restoration and waste management activities progress. In accordance with the needs of DOE programs, near-term support focuses on providing technologies for site investigation and for the study of remediation alternatives. Future technology efforts will focus more on waste treatment, remediation, and stabilization. During FY 1992, the Technology Development Program was revised to focus on specific technology solutions to more effectively meet needs.

Current technology developments and applications include the following:

- Robotic characterization of K-65 silos at Fernald cost $700,000 and reduced the immediate cost of adding unnecessary bentonite clay by approximately $3 million. (Additionally, an estimated $25 million may eventually be saved during the life of the project because a smaller inventory of clay will need to be removed from the silos during final remedial actions.) Robotics applications can also result in further savings by increased efficiency and productivity and can minimize the need for personnel to work in hazardous environments. Moreover, use of robotics will assist DOE in meeting its milestones under the Fernald Consent Agreement.

- A field-use Ion Trap Mass Spectrometer to provide rapid on-site analytical data was designed, built, and used at the Oak Ridge and Savannah River Sites. Field analyses can provide significant cost savings by reducing the overall number of samples collected and minimizing the time spent in the field waiting for analytical results.
- A Cooperative Research and Development Agreement between General Electric and Oak Ridge National Laboratory was signed, leveraging DOE's investment in polychlorinated byphenyl bioremediation development with private funding.
- A demonstration of in situ vitrification for pits and trenches was completed, advancing the possibility of applying this technology to one of the most difficult cleanup challenges in Oak Ridge.
- Technology for removal of volatile organics from groundwater and soils was successfully demonstrated and will result in major cost savings for the Government during the next decade of cleanup by improving removal rates as compared to conventional technology. Ground-penetrating radar and soil gas characterizations were used at 40 CERCLA sites at the Savannah River Site to optimize siting of wells. The savings for the operational phase of well installation and sampling is estimated at $2.4 million, with additional future savings anticipated in the well-closure phase.

These examples illustrate a basic tenet of the Technology Development Program—that the return on investment in technology development will be significant, both in the short-term and over the life of the project.

Training/Retraining Personnel

DOE programs require a considerably larger body of trained personnel to perform planned tasks. Environmental restoration and waste management education programs are beginning to graduate well-trained personnel. Three academic partnerships, established in FY 1990 and 1991, include more than 8,600 students and 80 faculty members pursuing 27 research tasks. One of these academic partnerships has been established with 17 Historically Black Colleges and Universities and minority institutions, with combined enrollment of approximately 106,000 students. A second partnership, with the South Carolina University Research and Education Foundation, includes five universities with combined enrollment of 48,000 students. Currently 400 students are enrolled in Waste Education and Research Consortium Programs; 15 students have graduated. The Waste Education and Research Consortium Program has been recognized by the National Society of Professional Engineers with an Outstanding Achievement Award. One additional consortium will be established in FY 1993.

Programs for training technicians involve more than 700 students and 27 faculty members. Precollege and general public outreach programs have involved 137,000 citizens, 120,000 students, and approximately 2,400 teachers. DOE has also assisted Native American education institutions through financial grants and donations of equipment and facilities.

Accomplishments in Facility Transition, Acceptance, Deactivation, and Disposition

As the DOE weapons complex is downsized and reconfigured, an increasing number of facilities will be declared surplus and transferred to EM for final disposition. This final disposition includes deactivation for alternative economic use or decontamination and decommissioning. The size of this task is enormous. It is anticipated that entire sites will be deactivated and readied for refurbishment or decontamination and decommissioning. EM launched a facility transition planning initiative to assess the scope of work and to manage transition activities.

Four new milestones have been added to the National Progress Chart for facility transition activities. To date, the facility transition initiative has been instrumental in the development of DOE-wide Transition Guidance, a comprehensive Rocky Flats Transition Plan, and acceptance criteria that facilities will need to meet before transfer may occur. Additional milestones will be established in future years as facilities are transferred to EM and plans for transition, decontamination, and disposition are developed.

Setbacks

In addition to the accomplishments summarized above, EM has also experienced programmatic setbacks. For example, the Waste Isolation Pilot Plant (WIPP) was ready to begin receiving waste for its test phase in October 1991. However, a U.S. District Court's ruling granting a preliminary injunction and then a permanent injunction against receipt of waste at WIPP indefinitely delayed its opening. As discussed in the Accomplishments section, Public Law 102-579, signed by the President in October 1992, placed WIPP back on course by establishing a new regulatory framework and specific requirements that must be met before initiating the Test Phase with waste. Assuming these requirements are met within the mandated timeframes, the earliest WIPP can receive its first Test Phase shipments is August 1993.

Setbacks in high-level waste vitrification have also been encountered. The Defense Waste Processing Facility, completed in 1990 at the Savannah River Site and originally planned to begin processing high-level waste in 1992, now is not expected to begin processing before 1994. Only preliminary site preparation began at the Hanford Waste Vitrification Plant in 1992, which was consistent with new schedules negotiated with the State of Washington and EPA last year. Delays at the Defense Waste Processing Facility have been attributed to problems experienced with this "first of a kind" technology. The lessons learned in starting up the Savannah River facility will benefit the development of the Hanford Waste Vitrification Plant and other waste treatment facilities in the future. While DOE has maintained the 1999 "hot start" date for the Hanford plant, it is recognized that the results of the 15-month study of the Tank Waste Remediation System could cause some delay.

The restart of facilities across the complex is also being delayed by more extensive efforts to bring those facilities into compliance with applicable environmental, health, and safety requirements. For example, the Waste Experimental Reduction Facility, a mixed waste treatment facility at the Idaho National Engineering Laboratory, is not expected to resume waste processing until mid-FY 1993 after a thorough safety review of all operations. Waste treatment and environmental restoration activities at most DOE facilities are experiencing some delays as a result of more stringent environmental and safety reviews by Field Offices and DOE Headquarters. Although not evident in the summary information in Figure 1.2a, siting of new waste treatment and disposal facilities may also be impacted by local environmental and safety concerns. As discussed in Sections 1.3 and 1.6.4, DOE is pursuing land-use planning, the National Environmental Policy Act process, and resolution of issues such as "how clean is clean" to address these difficulties.

Major Programmatic Objectives through FY 1998

Several major milestones have been identified for DOE environmental restoration and waste management activities, representing the most significant objectives through FY 1998. They include:

- Complete all Corrective Activities by FY 1997. (See Section 2.1.2 for a discussion of this objective.)

- Complete the assessment of contamination at more than 300 CERCLA and RCRA units by the end of FY 1998. The completion of the assessments will provide information necessary for DOE, EPA, States, Tribes, and the public to form opinions and make determinations as to the type and extent of cleanup to be conducted.
- Complete more than 250 cleanup and interim or removal actions through the end of FY 1998. Included in these actions will be those areas of higher risk to workers and the public at DOE sites. An additional 12 Uranium Mill Tailings Remedial Action sites will be closed during the same period.
- Open or expand more than 120 waste storage facilities by FY 1997. This effort will enable safe storage of the waste projected to be generated during this period of time while awaiting treatment and/or disposal.
- Complete the test phase and determine the suitability of WIPP for transuranic waste disposal by FY 1998 (delayed from FY 1997 because of court action, discussed previously). If WIPP is deemed suitable and legal at that point, full-scale shipments of waste stored at ten generator sites could begin.
- Strive for RCRA compliance for mixed waste by FY 1997. The development of effective treatment for mixed waste is a critical challenge. Compliance is expected to result from additional treatment capabilities and from negotiations regarding resolution of mixed waste issues currently in progress between DOE and EPA.

In addition to the crosscutting objectives presented in Section 1.6, each program has identified major near-term milestones, representing the most significant objectives for the five-year period 1994–1998. These are discussed in Section 2 of this volume.

1.3 ISSUES AND TRENDS AFFECTING THE ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT PROGRAM

A changing mission and a complex legal and regulatory climate are among the major issues that shape the environment in which DOE operates.

DOE uses several mechanisms to identify issues and trends that affect its programs, including strategic planning and analysis, roadmaps, self-assessments, and monitoring the progress of program activities. While issues identified and strategies to resolve them are presented in several sections of the FY 1994–1998 Five-Year Plan, this section focuses on five issues of key importance to the EM program: DOE's changing mission, land-use planning, contingency funds, the complex legal and regulatory climate, and safeguards and security.

The Changing DOE Mission

The changing DOE mission is the primary issue affecting the scope of work described in this Five-Year Plan. As a result of downsizing and reductions in the weapons complex, the generation of waste from production operations will eventually decrease. However, the transfer of a growing number of facilities and sites from an operating status to a cleanup mode will require the development of new technical and management approaches within the environmental restoration and waste management infrastructure.

On April 29, 1992, Secretary of Energy James D. Watkins announced his decision to phase out reprocessing of spent nuclear fuel as soon as possible. A sizable amount of spent fuel is in storage awaiting reprocessing. The phaseout decision means that more spent fuel will be placed in storage, and little additional high-level waste will be generated. DOE is preparing a comprehensive Spent Nuclear Fuel Management Plan that includes development of methods to process spent fuel for disposal or other appropriate action and long-term storage of spent fuel.

As a result of the decision to phase out reprocessing, and consistent with actions leading to downsizing of the nuclear weapons complex, more than 1000 facilities may be transferred to the EM program for cleanup. The Hanford N-reactor and reprocessing facilities already have been transferred to EM. Future transfers to EM may include the Idaho Chemical Processing Plant, the Rocky Flats Plant, and Savannah River's H-Canyon.

Facility transfers are discussed throughout the FY 1994–1998 Five-Year Plan and in detail in Section 2.3. DOE has launched a new initiative to address the technical, management, and institutional issues associated with successful deactivation, facility transition, decontamination, and final disposition. The impact of these changes on the DOE work force will also be examined. This effort will address issues such as strategic planning and risk assessment to prioritize acceptance and disposition of facilities and protocols for EM acceptance of facilities from other DOE offices. In addition, it will establish protocols for determining the appropriate disposition of facilities, focusing on future site and land-use planning.

Land-Use Planning

The need for land-use planning has been identified in several internal and external reviews of EM programs. Land-use planning is a process used most often by local zoning boards and other government organizations to determine the end use for a parcel of land. Federal land management agencies have been using this process to aid in decision making for many years. Local zoning boards use land-use planning, for example, when considering siting of shopping centers or municipal waste landfills in their jurisdictions. In light of the clear linkage among land-use, cleanup, and waste management decisions, DOE is beginning to incorporate land-use planning into all of its planning and decision-making processes (Figure 1.3a).

The downsizing and reconfiguring of the Nation's weapons complex creates the possibility for reuse or dismantlement of existing structures and alternative uses for the vast tracts of land at DOE sites. Future uses of some existing facilities are likely to differ markedly from their current uses for several reasons, including changes in U.S. demographics. For example, when Rocky Flats was built in 1952, it was remotely located. Today, with population growth and mobility, Rocky Flats is near a large population center.

As mentioned in the FY 1993–1997 Five-Year Plan, DOE has undertaken a systematic analysis of its program to direct reconfiguration efforts. Land-use planning will be part of the Nuclear Weapons Complex Reconfiguration Programmatic Environmental Impact Statement and the EM Programmatic Environmental Impact Statement. The DOE Weapons Complex Reconfiguration Study is a review of the Nation's needs and capabilities for weapons production in today's environment. The EM Programmatic Environmental Impact Statement will assess potential environmental consequences of alternative plans for waste treatment, storage, and disposal facilities and is discussed in greater detail in Section 1.6.1. The Environmental Restoration and Waste Management Configuration Study referred to in the FY 1993–1997 Five-Year Plan has been

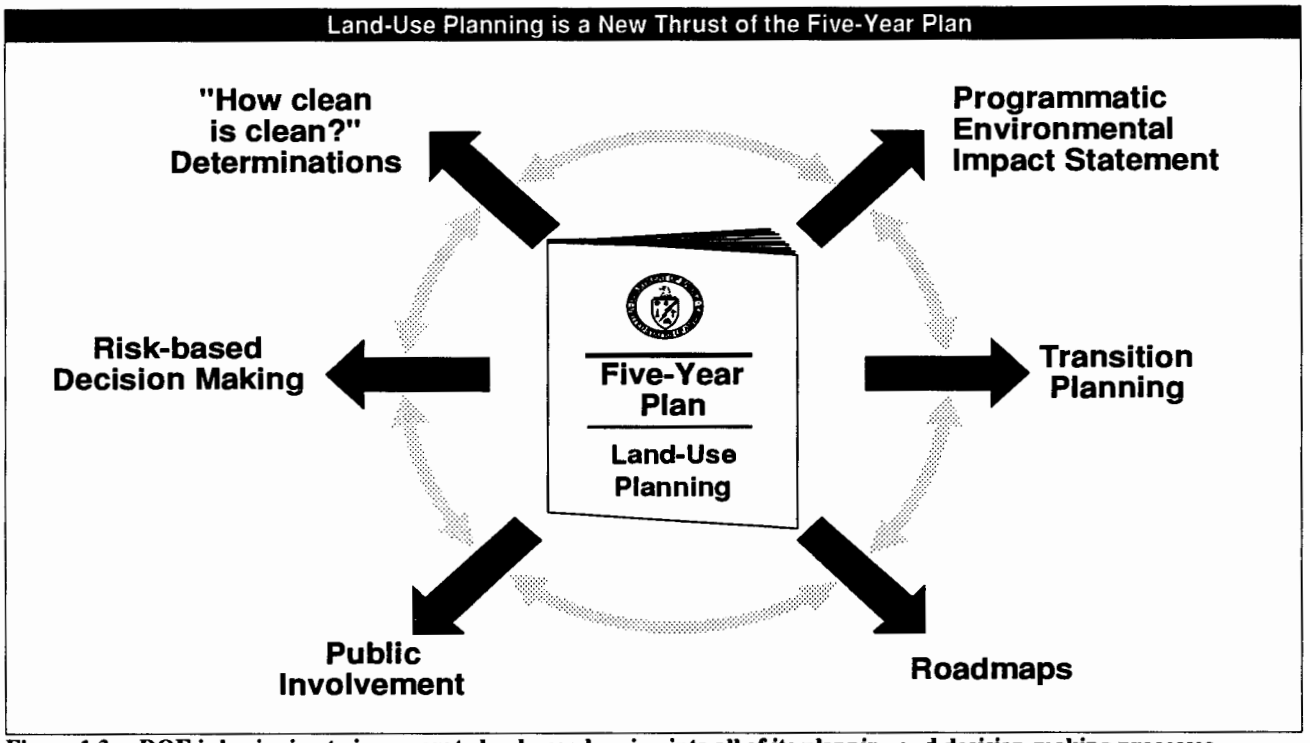


Figure 1.3a. DOE is beginning to incorporate land-use planning into all of its planning and decision-making processes.

subsumed into the Programmatic Environmental Impact Statement process.

The Final Report on DOE Nuclear Facilities, issued in November 1991 by the Advisory Committee on Nuclear Facility Safety (the Ahearne Committee), maintains that "the key to a workable environmental cleanup policy is land-use planning." The land-use planning process must consider factors such as current land-use, public values and expectations, cultural resources and use considerations, social and economic impact, local ecological and meteorological factors, legal rights and treaty obligations, technical and technological capabilities, and costs.

DOE intends to address land-use issues at two levels: first, to develop a complexwide land-use policy to address the Department's multiple missions and second, to use land-use planning at the site level to guide the identification and evaluation of alternative future site uses and appropriate remediation strategies. Both the land-use policy and specific land-use alternatives will be evaluated in terms of potential for risk minimization. DOE is developing general guidance to assist the Field Offices in implementing a land-use planning initiative that will build on local expertise in land-use planning and development control. DOE is seeking input from interested parties including States, Tribes and the public.

Formal land-use planning will result in the designation of sites for unrestricted use, for restricted access or use (e.g., commercial, industrial, wildlife habitat, and recreational), and for only its current use. A hypothetical example of a site using these designations is shown in Figure 1.3b.

The Defense Programs Nuclear Weapons Complex Reconfiguration Programmatic Environmental Impact Statement and the EM Programmatic Environmental Impact Statement will provide essential program level, and in some cases, site-specific input and analysis to define and evaluate the DOE stake in the future use of former weapons complex sites and how this stake may affect land-uses at a particular site. Decisions regarding future site use and cleanup must and will be integrated and balanced with the continuing mission of weapons production as well as the treatment, storage, and disposal requirements for production and cleanup waste. The EM Programmatic Environmental Impact Statement will specifically analyze the relationship between potential land-use options and cleanup levels across the DOE complex. The analysis will include potential generic land-use scenarios (e.g., unrestricted, somewhat restricted, and restricted use) within which various impact parameters will be assessed for ultimate decision-making purposes. The framework for this analysis will rely to a great extent on the solicited oral and written public comments received via public meetings and workshops and recommendations from the EM Advisory Committee during the Programmatic Environmental Impact Statement process.

Contingency Fund

In the National Defense Authorization Act for FY 1992 and 1993, Congress directed that the FY 1994–1998 Five-Year Plan include ". . . a discussion of the feasibility and need, if any, for the establishment of a contingency fund in DOE to provide funds necessary to meet the requirements in environmental laws, to remove an immediate threat to worker or public health and safety, to prevent or improve a condition where postponement of activity would lead to deterioration of the environment, and to undertake additional environmental restoration activities at DOE defense nuclear facilities that are not provided for in the budgets for fiscal years in which it is necessary to meet such requirements or undertake such activities."

EM responded to that mandate by examining the feasibility and need for a contingency fund. Provisions for contingency funding are a common practice in private industry in situations where it is difficult, if not impossible, to anticipate all possible future events and schedule constraints demand timely response to unexpected circumstances.

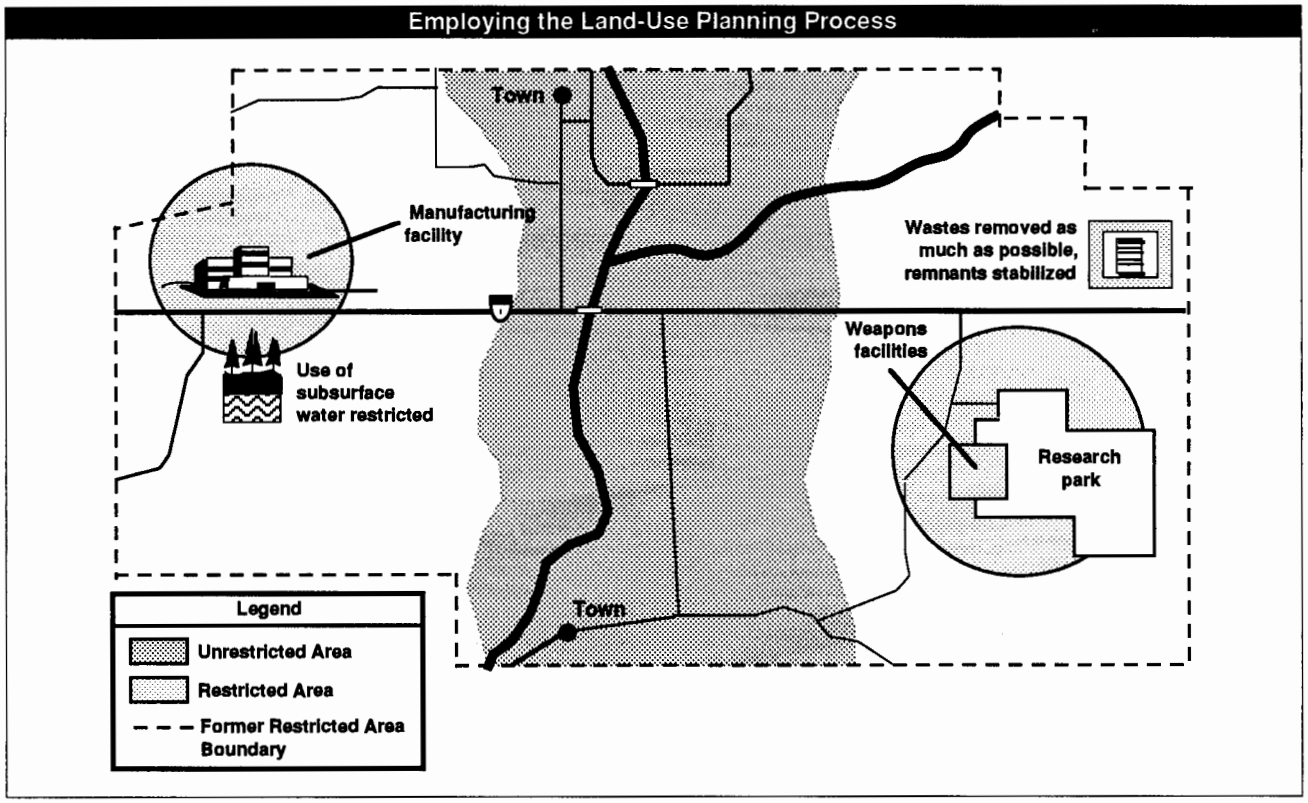


Figure 1.3b. A hypothetical example of a DOE site after employing the land-use planning process.

The DOE has adopted some of the practices used by the private sector to account for uncertainty in these kinds of activities. Contingencies, for example, are included in cost estimates. These contengencies are based on the type of activity and its stage in progress and are then included in budget estimates. In the absence of contingency funds, cost estimates for planned activities may be very conservative (i.e., high) in an effort to compensate for potential future developments, a situation that also presents problems in allocating Federal funds. In the past, DOE has compensated for uncertainty by requesting funds for unspecified interim response actions.

The nature of many EM activities includes a high degree of uncertainty. This situation is compounded by the lengthy Federal budget process in which funding requests are prepared over a year ahead of time. Examples of activities that could justify use of contingency funding include:

- the assessment of a contaminated site to meet an enforceable milestone in a cleanup agreement identifies substantially more contamination than anticipated, requiring much more sampling and analysis than budgeted.

- a drum of mixed waste being stored pending treatment at a facility not yet in operation begins to leak, and immediate corrective action is required to protect workers, the public, and the environment.

- inspection of a surplus EM facility prior to decontamination and decommissioning identifies a large amount of old, potentially unstable chemicals that could pose an immediate safety threat. Remote characterization and processing equipment is required to evaluate and dispose of the chemicals.

- an agreement negotiated to resolve issues identified in a "Notice of Violation" of regulatory requirements includes a milestone to immediately correct the violation. If this milestone is not met, DOE will incur substantial fines and penalties.

- several containers suspected to contain special nuclear material are discovered during remediation of an old waste disposal area. Immediate action is required to stabilize and control the area being remediated while the containers are isolated, to develop and implement security plans, to design and build special equipment for characterization, and ultimately to properly dispose of the contents of the containers.

The process of budgeting for environmental restoration and waste management activities must include adequate levels of funding, provide flexibility to accommodate unexpected program needs, and ensure the public that DOE will be responsive to public concerns and conduct its business in a cost-effective and environmentally sound manner. Under the current Federal budget system, such flexibility is much more difficult. The traditional Federal practice is to fund projects on an annual basis, with multiyear projects receiving "no year" money but subject to annual review. This enables Congress and the President to closely monitor progress and provide direction to the agency carrying out the project. The current budget process also does not provide mechanisms by which budget allocations might be rapidly adjusted in response to unexpected circumstances. Reprogramming, supplemental requests, and amendments to the budget are alternatives to a contingency fund, but some can be time-consuming. DOE has been successful in getting timely changes to its budgets. For example, in FY 1992 a supplemental request for $100 million was enacted and in FY 1993 a reprogramming request was approved. The current process recognizes this need for balance between Congressional and Executive oversight and flexibility.

An EM task force is continuing to evaluate a number of aspects of contingency funds, including administrative requirements, legal implications, appropriate fund size, and procedures for implementation.

Complex Legal and Regulatory Climate

Another issue affecting DOE programs is an extremely complex regulatory climate, with activities directed by provisions of compliance and cleanup agreements with EPA and various State governments, court orders, consent decrees, and applicable Federal and State regulations and statutes. The number of enforceable compliance and cleanup agreements rose to 87 by mid-1992, composed primarily of documents dealing with CERCLA and RCRA requirements. The provisions of these agreements and the associated regulations are often quite specific and vary from installation to installation. DOE is also working to integrate the values of the National Environmental Policy Act into the requirements of CERCLA, thereby minimizing duplication of effort and streamlining the decision-making processes embodied in both acts.

In August 1991, the U.S. Department of Justice confirmed the application of Executive Order 12088 to EM activities. The Order specifies that the head of each executive agency must request sufficient funding each year to comply with Federal pollution control standards. The Order also requires DOE to submit an annual plan that estimates the cost required to ensure compliance with all applicable pollution control standards.

Although meeting legal requirements is paramount in EM planning, there are specific areas, such as worker safety and health, where DOE is self-regulating. While DOE is not directly subject to provisions of the Occupational Safety and Health Act, for example, it is subject to specific DOE Orders that embody both the provisions and intent of this law. Other DOE Orders mandate stringent radiation protection requirements. Without exception, DOE implements its program under health and safety safeguards that are in accord with pertinent Federal statutes.

Monitoring, decontamination, dismantlement, and final disposition of surplus facilities are not currently associated with legal requirements. However, in recent negotiations of agreements at Hanford and other sites, schedule and completion requirements for these activities have been considered for inclusion.

The Technology Development Program is directing and performing applied research and development for technologies needed to accomplish the EM mission. More applied research is needed to provide adequate technologies to support cleanup commitments already made. Although funding for this research is not legally mandated, it will be difficult for DOE to meet the provisions of its enforceable agreements related to waste treatment and disposal without the development of new technologies. Furthermore, efficient use of limited resources requires the devotion of time and money to emerging technologies, especially in cases where existing technology is extremely expensive or simply nonexistent.

EM is responsible for landlord activities at several sites and anticipates becoming landlord at additional sites. The primary objective of the landlord program is to support a site's basic infrastructure, and DOE Program Offices have been designated as landlords of various DOE installations. A site's infrastructure includes electrical distribution systems; water distribution systems; steam generation and distribution systems; site roads and railroads; general-purpose buildings, including shops, offices, and warehouses; and fire, medical, data processing, telecommunications, and transportation equipment and systems. A sound infrastructure is necessary to maintain essential services and to maintain compliance with legal requirements.

Safeguards and Security

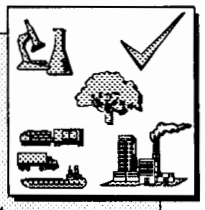
Increased focus is required on the issue of safeguards and security practices at DOE facilities with environmental restoration and waste management activities, particularly given increasing EM responsibilities for landlord activities and facility transition. Landlord responsibilities at some DOE installations (also discussed in Section 1.6.3) include special nuclear material control. Such material must be managed in accordance with the Atomic Energy Act of 1954, as amended. To ensure that the mission is accomplished and that these responsibilities are met, EM established a Safeguards and Security staff in January 1992.

EM is developing a facility safeguards and security concept to concentrate classified assets in defined areas at each facility. These assets include special nuclear material that requires protection under statutes, laws, and DOE Orders. Once these protective measures are taken, the remainder of the facility can be opened to uncleared personnel for decontamination and remediation work. This concept, combined with the identification and implementation of new protection technologies, will allow for a reduction in costs associated with safeguards and security activities.

The Hanford Site has taken the lead in developing this concept and has prepared a plan to consolidate special nuclear material and classified material in specific buildings. Consolidation should result in considerable cost savings as a result of the projected decreases in the size of the protective force and related protection systems and a reduction in the need for cleared personnel to support the cleanup and waste management mission. It will also reduce the cost of contractor support obtained by DOE.

EM will closely monitor implementation of the Hanford consolidation plan, analyzing the results to determine applicability to other DOE installations. If the results warrant, the concept will be expanded to other EM facilities.

1.4 STATUS OF INITIATIVES FROM THE FY 1993–1997 FIVE-YEAR PLAN



Initiatives identified in the FY 1993–1997 Five-Year Plan are helping DOE meet its environmental goals and improve the quality, efficiency, and acceptance of its programs.

The FY 1993–1997 Five-Year Plan identified several initiatives considered essential to the success of the DOE Environmental Restoration and Waste Management Program. Among these initiatives are establishing sound cost-management procedures; tracking the progress of EM activities; improving relations with States, Indian Tribes, and other Federal agencies; and updating contracting strategies.

Establishing Sound Cost-Management Procedures Implementing the Interagency Review Group Report Findings

DOE is striving to ensure that environmental restoration, waste management, and technology development activities are conducted in the most cost-efficient manner. Steps to address this concern were mentioned as initiatives in the FY 1993–1997 Five-Year Plan and include a series of reviews during the last year that focused on cost estimating, activity scheduling, and cost validation and analysis functions.

Internal Reviews

During DOE's internal review budget cycle for FY 1993, EM identified the need for a substantial budget increase from FY 1992 to enable full compliance with environmental laws, regulations, enforceable agreements established with EPA and State regulators, and DOE Orders. This budget increase was also identified in the FY 1993–1997 Five-Year Plan, which presented planning estimates at two levels, the Preliminary Unvalidated Case and Validated Target Level. Consistent with Five-Year Plan guidance, each Field Office conducted reviews of their initial Activity Data Sheet (ADS) submittal to identify critical activities and to assess the adequacy of their cost estimates. Upon receipt of the field submittals, EM then initiated program reviews by 39 cost review teams. These Headquarters-led teams reviewed supporting documentation and assumptions for each of the approximately 2000 ADSs on which the plan was based. Concurrent with these reviews, EM reviewed the ADSs from a programmatic perspective (i.e., Was the activity necessary and timely?). The initial field submission of $7.7 billion was thereby reduced to the Preliminary Unvalidated Case of $6.9 billion. EM also attempted to develop a program at the $4.7 billion Validated Target Level to address legal and critical health and safety requirements. Results of these reviews were included in the FY 1993–1997 Five-Year Plan.

To develop the FY 1993 internal review budget request, EM evaluated each ADS again to determine necessary funding for legal and other critical programmatic requirements and to identify possible cost reductions in those ADSs. These reviews resulted in the identification of a $5.8 billion requirements level. A final EM internal review focused on the funding necessary to comply with DOE's legal requirements. This review was conducted by a team of senior EM officials and involved all of the ADSs. In addition, the Secretary directed that the Office of Procurement, Assistance, and Program Management conduct an independent review of the EM budget request.

Major deficiencies noted in the internal review process include insufficient definition of tasks required to support the EM program, inadequate independent reviews of cost estimates, and insufficient management attention to cost control. As discussed later in this section, EM has instituted a number of actions at the Field Office and Headquarters level to correct these deficiencies. Lessons learned from these reviews will also be factored into the development of future ADSs.

External Reviews—The Interagency Review Group Report

DOE, in conjunction with EPA, the Justice Department, the Office of Management and Budget, the Department of Defense, and the U.S. Army Corps of Engineers, completed the most intensive review of the EM program ever undertaken. The study, referred to as the Interagency Review Group Report, analyzed the level of funding needed in FY 1993 to meet legal requirements in the cleanup of DOE facilities.

The report expressed confidence that a funding level of $5.534 billion in FY 1993 would be adequate to meet all Federal, State, and local legal requirements; to fund all activities required by DOE Orders that establish standards for environment, safety, and health; and to make prudent levels of investment in discretionary and management activities. The report also made a number of recommendations aimed at correcting deficiencies in the EM program.

The Interagency Review Group's review effort followed two previous internal reviews directed by the Secretary during 1991. There was a substantial amount of agreement between the conclusions of the two prior DOE internal reviews and this effort. The estimated total costs of FY 1993 EM activities from all reviews were within nine percent of each other, although larger differences occurred for individual ADSs.

The Interagency Review Group's recommendations also confirmed prior DOE findings that a number of deficiencies existed with respect to cost control, cost estimating, and allocation of overhead costs. The review identified the need for further personnel increases in the EM program, particularly to manage and control DOE cleanup activities at the field level. The six major recommendations from the Interagency Review Group and DOE initiatives in response to those recommendations are summarized below and in Figure 1.4a.

Recommendation 1: *The DOE Progress Tracking System should be implemented to include the following changes:*

- *restructuring the ADSs to reflect a more logical work breakdown structure,*
- *identifying the legal requirements behind each ADS, and*
- *measuring actual versus planned expenditures and cleanup progress.*

To effectively track program performance, DOE developed a Progress Tracking System, which was announced in the FY 1993–1997 Five-Year Plan and launched in October 1991. This system was updated throughout FY 1992 to keep pace with rapid developments in the EM program, and significant changes will be implemented in FY 1993. The Progress Tracking System is discussed in more detail under "Tracking Program Progress" later in this section.

Based on guidance from the Department of Justice, DOE developed a three-tiered legal screening system that was applied to all ADSs. This three-tiered system formed the basis for the system later used by the Office of Management and Budget and the Army Corps of Engineers during the Interagency Review Group's review. In addition, the DOE planning data base has been revised to capture the funding associated with each cleanup activity and also will be expanded to identify regulatory requirements associated with each planned milestone for specific cleanup activities.

Recommendation 2: *EM should revise its budget execution process to increase accountability and ensure that legal requirements are met, develop a*

formal budget execution plan, and adopt a change control process at the ADS level.

When fully implemented, the Progress Tracking System will be, in effect, a budget execution plan because it will track progress against expenditures. Through input to the Progress Tracking System, EM and its contractors will account for the status of activities against commitments, slips in schedule and corrective actions, and "earned value" (i.e., what was accomplished for the dollars expended). As discussed throughout this Five-Year Plan, ADSs provide information about the scope, funding, and regulatory drivers of EM activities, and they therefore define activities needed to meet legal requirements. In addition, EM is in the process of developing change control procedures that would identify the methods for making ADS changes at Headquarters and Field Office levels. Dollar or scope-of-work thresholds will be defined for both Field Office and Headquarters change approval.

Recommendation 3: *DOE should conduct a formal analysis of Field Office overhead costs and establish revised overhead rates to save money.*

Secretary Watkins has directed the DOE Chief Financial Officer to perform an in-depth study and evaluation of overhead allocations at each DOE Field Office. This study is currently under way, and its findings will be implemented during FY 1993. The EM program has identified similar needs in this area and is currently engaged in a number of activities to reduce and redistribute overhead costs.

Recommendation 4: *To eliminate overestimated costs, DOE should develop and implement revised cost-estimating methods and standards and strive to hire staff with cost-estimating skills.*

In 1991, the EM Cost Quality Management Program was implemented to improve the cost-effectiveness of technical activities and to establish consistent costing policy guidelines. The Cost Quality Management Assessments are conducted to provide a baseline for measurement of future improvement. In addition, Environmental Restoration, Waste Management, and Technology Development Programs have developed revised programmatic cost-estimating guidelines. With regard to staffing, DOE will identify an appropriate staffing mix of cost-estimating and technical expertise.

Recommendation 5: *EM should completely restructure its technology development planning process to integrate new developments with cleanup planning.*

In December 1991, DOE initiated planning for complete restructuring of its technology development efforts. As part of that initiative, EM has developed a needs assessment as a management tool to help make research and development efforts more responsive to cleanup needs. Collaborative demonstrations will be conducted with DOE line organizations, and proven technologies will be transferred to specific DOE sites. Although EM's technology development activities do not represent legal commitments, they will ensure that legal requirements are met more cost-effectively. DOE's legal drivers for cleanup activities are typically based on the use of available technologies to ensure early containment and confinement of contaminants while unique solutions are developed that are economically feasible and satisfy legal requirements.

Recommendation 6: *EM should improve its Five-Year Plan to link legal requirements and ADSs, to provide more accurate cost estimates and assessments of actual progress, to include a risk-based priority system, and to meet the requirements of the Office of Management and Budget Circular A-106.*

As discussed throughout this plan, DOE has strengthened its ability to identify legal drivers associated with its environmental restoration and waste management efforts. In addition, as this entire section illustrates, major strides have been made in improving cost-estimating techniques and enhancing program tracking capability. With respect to the Interagency Review Group recommendation on a

risk-based priority system, most of the EM program is legally driven. EM supports risk-based decision making. However, to be most effective, the concept should be applied during the development of regulatory requirements. If done sequentially, there may still be benefits from risk-based decision making, although they would be reduced. Risk reduction is discussed further in Section 1.6.4.

EM does not use the Five-Year Plan as an A-106 submission. A-106 plans are prepared in response to Executive Order 12088, which requires Federal agencies to prepare an annual pollution control plan that includes estimates of costs to attain compliance with environmental requirements. The DOE A-106 plan includes EM compliance and cleanup projects in the format required under EPA's guidance. The responsibility for the coordination and compilation of the A-106 plan rests with DOE's Office of Environment, Safety, and Health. EM is taking steps to improve the ADS development process by clearly identifying A-106 project information.

The Cost Quality Management Program

The Cost Quality Management Program is a part of the EM effort to support self-assessments and improve the cost-effectiveness of EM operations. This program includes a component called the Cost Quality Management Assessment, a systems approach to evaluating how DOE sites are performing cost- and schedule-estimating and analysis activities. During the Cost Quality Management Assessment, a sample of the Five-Year Plan ADSs are evaluated to determine the degree of compliance with the cost-estimating guidance for the Five-Year Plan and to

Interagency Review Group Recommendations and the FY 1994–1998 Five-Year Plan Response

Interagency Review Group	This Five-Year Plan
Restructure ADSs to reflect logical Work Breakdown Structure	ADSs restructured to align with new Work Breakdown Structures
Identify legal requirements and DOE Order at ADS and sub-ADS level	Legal requirements identified at ADS milestone level; FY 1994 divided into legal, DOE Order, and other desirable activities
Measure actual expenditures against the plan; develop formal budget execution plan	Progress Tracking System implemented per prior Five-Year Plan commitment
Establish formal change control process	DOE Order 4700 being applied to EM activities; Programs establishing specific change control processes

Interagency Review Group	This Five-Year Plan
Undertake detailed analysis of overhead	Chief Financial Officer responsibility; completed July 1992
Revise cost-estimating guidelines	Cost Quality Management Assessment, program cost reviews, and expanded handbook
Restructure Technology Development Program planning process	Needs analysis completed, Research and Development, Peer Review
Improve quality of Five-Year Plan	Five-Year Plan continually under improvement
Incorporate risk-based priority system	Risk Analysis has been in review since 1990 by National Academy of Sciences, Keystone, EPA, and others
Supplement plan to meet A-106 requirements	Plan is being revised to incorporate A-106 items. The Five-Year Plan is not DOE A-106 report

Figure 1.4a. The Interagency Review Group addressed the concerns of the Secretary regarding the required funding levels for the FY 1993 cleanup program and identified areas of needed improvement within the EM program.

assess the realism, reasonableness and defensibility of the cost estimates. The results of the assessments are provided to program managers for use in correcting deficiencies and making the appropriate adjustments to the ADSs.

The first round of the Field Office Cost Quality Management Assessments was completed in March 1992 at 12 sites: Fernald Environmental Management Project, Los Alamos National Laboratory, Pantex Plant, Kansas City Plant, the Rocky Flats Office and the DOE Chicago, Idaho, Nevada, Oak Ridge, Richland, San Francisco, and Savannah River Field Offices. The assessments of ADSs and supporting information were performed by a multidisciplinary team of cost engineers and estimators, accountants, environmental engineers, and project/program managers.

Several deficiencies were identified by the cost quality management teams. The following highlights apply to one or more sites; all items were not identified at any one site:

- lack of a consistent scope definition for projects;
- insufficient numbers of Federal employees with analytical skills for cost and/or schedule analyses;
- underutilization of professional estimating personnel for development and/or review of estimates;
- inadequate cost-estimating process caused by fragmentation and lack of formal, independent cost-estimate reviews;
- lack of documentation of ground rules and assumptions for cost and schedule estimates;
- improper calculation and application of indirect rates and escalation estimates;
- insufficient use of decision-making tools, such as technology risk assessment, life cycle cost analysis, value engineering, and cost-benefit analysis;
- insufficient number of Federal employees to oversee contractors;
- lack of cost-estimating guidelines and procedures; and
- lack of cost-estimating data and techniques and methods.

DOE will analyze these findings to determine their root causes and develop strategies to address them. In addition, within 45 days of receipt of a site-specific cost quality management final report, Field Offices are required to develop action plans to correct deficiencies. The sites will be revisited to monitor their progress. DOE expects significant improvements in cost-estimating and program management as a result of these Cost Quality Management Assessments. A number of the findings also apply to activities managed by the Office of Defense Programs. EM will work with Defense Programs to analyze findings and to develop joint corrective action plans to resolve issues, thereby minimizing duplication of effort.

DOE is also conducting a number of technical oversight and self-assessment studies to ensure that its program is conducted in a technically valid and cost-effective manner. The studies focus on areas of significant potential cost impacts and identify areas for improvement for Headquarters and the Field Offices. An example of ongoing studies is the cost/risk trade-off analysis.

The cost/risk trade-off analysis is intended to identify ways to improve the analysis of cleanup costs and health and environmental risk in the evaluation of alternative remedial actions. The analysis is being conducted for one of the operable units at the Hanford Site. Based on site-specific information, DOE will develop an analysis to describe the cost and risk trade-offs in qualitative and quantitative terms. One goal of the analysis is to rank remedial action alternatives by cost-effectiveness to identify alternatives that would achieve a given level of risk reduction at lower cost and still meet regulatory requirements. Any improvements identified in the CERCLA decision process from the cost/risk trade-off analysis will be shared with other DOE facilities requiring remedial actions.

Setting Priorities

In light of the resource-constrained environment in which DOE must operate, setting clear priorities will be an important complement to planning, cost-estimating, and budgeting processes.

Using the categories developed to designate ADS activities and in response to Executive Order 12088, DOE plans and budget proposals are developed to ensure that all legal requirements are fully met. Figure 1.4b depicts this approach. As in past Five-Year Plans, EM uses a four-category system to assess priority:

Priority 1: Present and near-term health and safety impacts: all activities necessary to prevent near-term adverse impacts to workers, the public, or the environment.

Priority 2: Legally mandated: all activities required to meet the terms of agreements (in place or in negotiation) between DOE and Tribal Governments or 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.

Priority 3: Compliance other than categories 1 and 2: all activities required for compliance with external environmental regulations (including RCRA, CERCLA, and the National Environmental Policy Act) that were not already addressed by Priorities 1 or 2. This category also includes compliance with DOE Orders that implement external regulations setting specific DOE regulatory standards, actions that would reduce risk or costs, and actions that would prevent disruption of DOE's production mission.

Priority 4: Desirable activities: all activities not required by regulation but that DOE believes are desirable (e.g., technology development activities).

One change has been made to these definitions. In the first two years of the EM program, all ongoing efforts were included in Priority 1. This enabled the new EM program to be planned and implemented without major disruption to existing DOE environmental efforts. Now that the EM program is in its fourth year, all efforts, whether new or ongoing, are equally scrutinized. Thus, all special references to ongoing activities in priority categories have been deleted. The work to be performed under each priority was further categorized to identify activities driven by legal requirements, other environment, safety and health requirements, and other desirable program requirements.

Legally required activities extend beyond those necessary to meet DOE commitments in signed agreements to include all activities required to meet legal obligations under all applicable Federal, State, or local environmental requirements. Failure to fund activities included within this category would likely result in violation of the applicable requirement, subjecting DOE to potential enforcement action by a regulator. For the purposes of the FY 1994–1998 Five-Year Plan, pending permits and agreements are also included in this category. Activities necessary to meet a near-term or outyear milestone are also included if failure to fund them will likely result in failure to meet future legal milestones.

Other environment, safety and health activities primarily include those required to meet internal environmental, safety, and health requirements when those activities are not legally required. Failure to fund these activities could cause serious safety concerns.

Other desirable programmatic activities include activities not required by either environmental law or internal DOE Order. Examples of major activities in this area are decontamination and decommissioning, activities under Agreements-in-Principle with States and Indian Nations, many technology development efforts, and management oversight to prevent waste, fraud, and abuse.

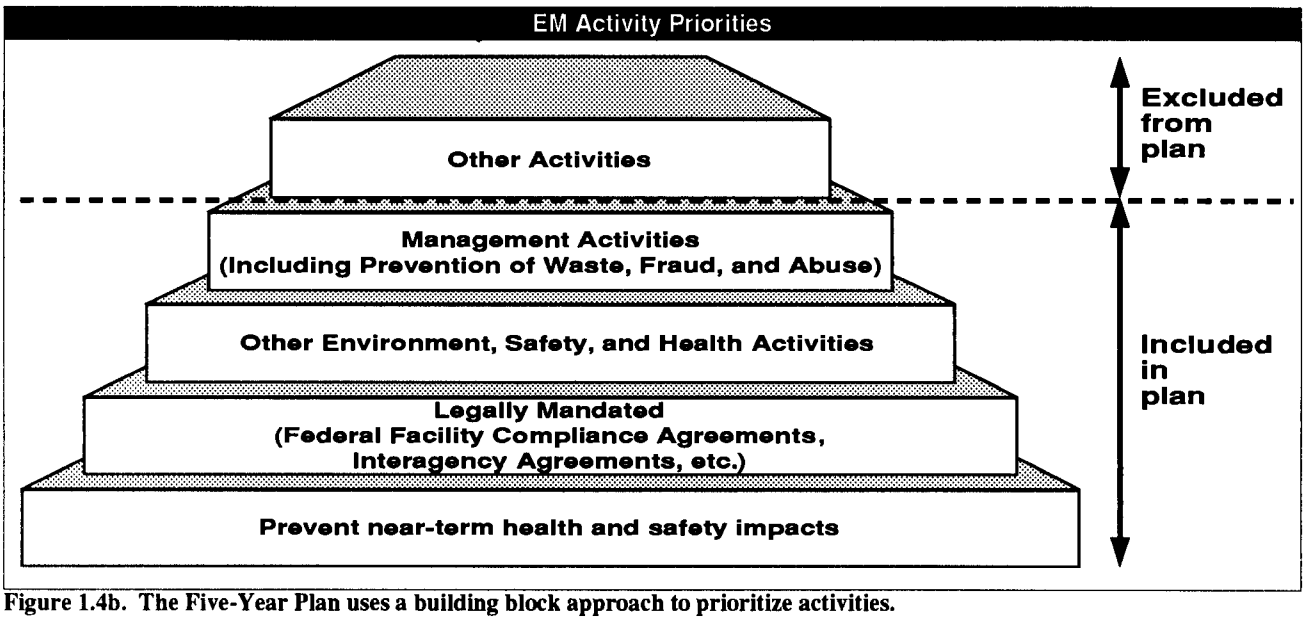


Figure 1.4b. The Five-Year Plan uses a building block approach to prioritize activities.

Program-Level Priority Systems

Each of the three major EM programs is in the process of developing detailed programmatic prioritization tools to help them further understand potential trade-offs among specific activities. These systems are briefly described below. DOE recognizes that public participation is essential in these prioritization efforts. Each of the major EM programs is working to incorporate public participation and public comments into its decision making.

Prioritization has been a difficult but necessary element of the evolution of DOE's environmental restoration and waste management programs and is intended to assist decision making, as necessary, to balance the practical ability to accomplish work under reasonable management and funding scenarios. Since its inception, EM has attempted to develop with full public involvement a national risk-based prioritization system. Such a system, when applied, would establish work priorities at DOE sites based on relative risk and the need to address the most significant environmental problems at a faster pace than other program activities. To date, the effort has not met with success.

Central to the problem of developing such a system is that DOE operates under a regulatory system that, for the most part, does not allow prioritization based on risk. Under most environmental laws and implementing regulations, regulated entities are required to correct environmental violations at a pace that is unrelated to associated risks. Similarly, EPA and States enforcing environmental requirements must administer regulations rather than risk-driven programs. DOE supports the concept of risk-based decision making and believes that the concept needs to be applied during the development of laws and implementing regulations.

Waste Management Program. The Waste Management Program is developing a Resource Allocation Support System to aid in the budget decision-making process. This system will be used to conduct analyses to provide insight into the degree to which proposed activities accomplish waste management objectives and will examine the implications of alternative funding scenarios.

The system is still in the early developmental stages and is proceeding with full public involvement. Comments from States, Tribes, EPA, Office of Management and Budget, environmental

organizations, labor groups, and other interested external organizations were collected in interviews during the summer and fall of 1991, and a *Federal Register Notice* soliciting public comment was published in December 1991. A national workshop on development of the Resource Allocation Support System was held in January 1992; a pilot study including external involvement was conducted at field sites during the summer of 1992.

Environmental Restoration Program. The Environmental Restoration Program has developed a priority system to assist budget decision makers in planning. This system has three priority classes for proposed environmental restoration activities based on the urgency of the problems the activities are to address:

Class 1: emergency activities, for which DOE seeks immediate funding and initiates the activities as soon as possible.

Class 2: time-critical activities, which are guaranteed funding in the fiscal year in which each activity will be implemented.

Class 3: other high-benefit and time-sensitive activities, which are grouped and ranked in the priority-setting process to determine whether they are funded as planned.

Some commentors have expressed concern that health and safety risks are not sufficiently defined to be used in the environmental restoration priority-setting analysis. To address this concern, DOE and the Agency for Toxic Substances and Disease Registry of the U.S. Public Health Service have been working during the past 14 months to coordinate the performance of health risk assessments at DOE sites. The Agency will perform health assessments and health consultations, prepare toxicological profiles, and perform other health-related activities. This improved data should provide better input to the risk-based system.

The National Academy of Science panel on the Environmental Restoration Priority System met for the first time on December 17-18, 1992, in Washington, D.C. The panel is tasked to review the design methodology and application, and will undertake this review over the next 30 months.

Public participation in priority system applications will be integrated with public participation in other EM programs. *Environmental Guidance: Public Participation in Environmental Restoration Activities, November 1991, DOE/EH-0221*, contains guidance to DOE field offices about conducting meaningful, interactive public participation in all EM programs. DOE is developing a public participation process that will integrate public participation in all EM programs.

Technology Development Program. Priorities in the Technology Development Program are based on the needs of the Environmental Restoration and Waste Management Programs; other DOE offices; State and local regulators; policy-making bodies, such as Office of Management and Budget and the U.S. Congress; and the public. The needs of these groups fall into two broad categories: the development of technology and the development of infrastructure, including education and training, technology integration, emergency response, and transportation.

Although few regulations specifically require technology development, analyses of DOE's ability to meet environmental restoration and waste management requirements clearly identify areas where current technology is insufficient. Selection of specific technology and infrastructure programs is based on a deliberate determination of prioritized user needs and a methodical, thorough evaluation of the relative technical benefits, cost-effectiveness, and risks of both competing and complementary activities. This prioritization process ensures well-informed decisions responsive to the widely varying customer needs.

Updating Contracting Strategies

As mentioned in the FY 1993–1997 Five-Year Plan, DOE management has begun to review and revise the methods used to implement environmental restoration projects. Specifically, after the report of a task force established to investigate contracting options, DOE has decided to employ Environmental Restoration Management Contractors (ERMC) to manage environmental restoration activities at a number of sites.

The ERMC contracting system is designed to improve efficiency of cleanup and restoration activities. Whereas an existing contracting system that relies on "management and operating" contracts was designed for oversight and personnel staffing for nearly all production operations at a site, the ERMC system was conceived to provide specialized capabilities for environmental restoration tasks.

ERMC will be responsible for managing the environmental restoration activities of the site, and will also have the option of performing the remedial investigation/feasibility study portions of the cleanup process. After the Record of Decision is issued, the remaining work will be subcontracted by the ERMC to companies with demonstrated specific expertise, technology, and experience in performing cleanup activities. ERMC will be responsible for reviewing and evaluating subcontractor performance. Two changes in DOE contracting procedures will be incorporated into the ERMC process. First, the contracts will be established using the Federal Acquisition Regulations, as opposed to the DOE Acquisition Regulations, providing better coordination with Federal Government standard provisions. Second, ERMC will be paid on an invoice-review basis. Specifically, after the work is performed, ERMC will submit a payment invoice for approval by EM management. This system is designed to improve cost management control and efficiency.

Two sites, Fernald and Hanford, have been chosen as pilot sites for this program. The ERMC at Fernald, Fluor Daniel Corporation, was chosen in August 1992, and the ERMC for Hanford is expected to be selected in early 1993.

Tracking Program Progress

One of the major objectives of the FY 1993–1997 Five-Year Plan was the development of sound fiscal management systems. In October 1991, all sites with EM activities began to implement the Progress Tracking System, a tool designed to track program activities, accomplishments, and resources on a monthly basis. The Progress Tracking System provides a consistent set of indicators for measuring project progress. The status of key program milestones is tracked against planned and actual costs, providing a method for determining that the program resources are being spent to accomplish intended activities. Cost overruns/underruns and schedule slippages will be identified so that corrective actions may be initiated in a timely manner.

The Progress Tracking System (Figure 1.4c) was developed to fulfill three DOE goals:

- to improve program and financial management capabilities and support the identification of expenditures, accomplishments, and areas requiring management attention;
- to provide a consistent EM-wide reporting format; and
- to respond to internal and external requests (e.g., from Office of Management and Budget, Congress, and other agencies) for information.

ADSs form the foundation of the Progress Tracking System data. The system's reporting capabilities provide the fine details required by Headquarters and Field Office program managers and will also assist in developing the "big picture" of programmatic progress. EM program managers can use the information to oversee cleanup activities and monitor the status of activity milestones.

The Progress Tracking System is still undergoing development to enhance its reporting capabilities and to make it easier to use. When these enhancements are implemented, DOE will have a state-of-the-art tracking system that will ensure the best possible information from which to evaluate current program management and plan future activities. In addition, the DOE expenditure data base maintained by the Office of the Chief Financial Officer is being linked to this system to ensure accurate accounting.

In operation, the system provides monthly updates of planned and actual costs, milestone status, and accomplishments at the ADS program/project level. The FY 1993 release will include earned value performance measurement reporting for certain DOE projects, increased direct linkage with existing Field Office and contractor program management systems, and other modifications to improve user friendliness and display of information. Other FY 1993 enhancements to develop a comprehensive, integrated EM Progress Tracking System include a direct "call-up" capability to the ADS and the budget data bases. The Progress Tracking System is a key tool in ensuring the EM program is managed and funded efficiently and effectively. The Progress Tracking System will be the final link in the management system designed to ensure that a valid and defensible budget is developed, to track the progress of all EM-funded activities, and to measure accomplishments against expenditures.

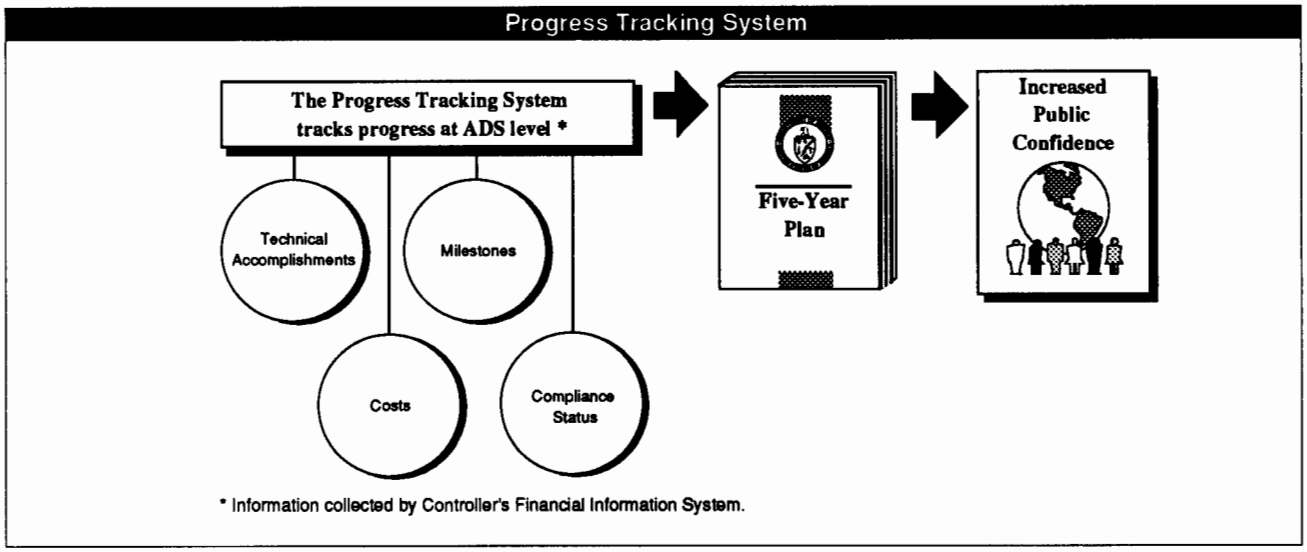


Figure 1.4c. The Progress Tracking System will increase public confidence by clearly tracking accomplishments against Five-Year Plan commitments.

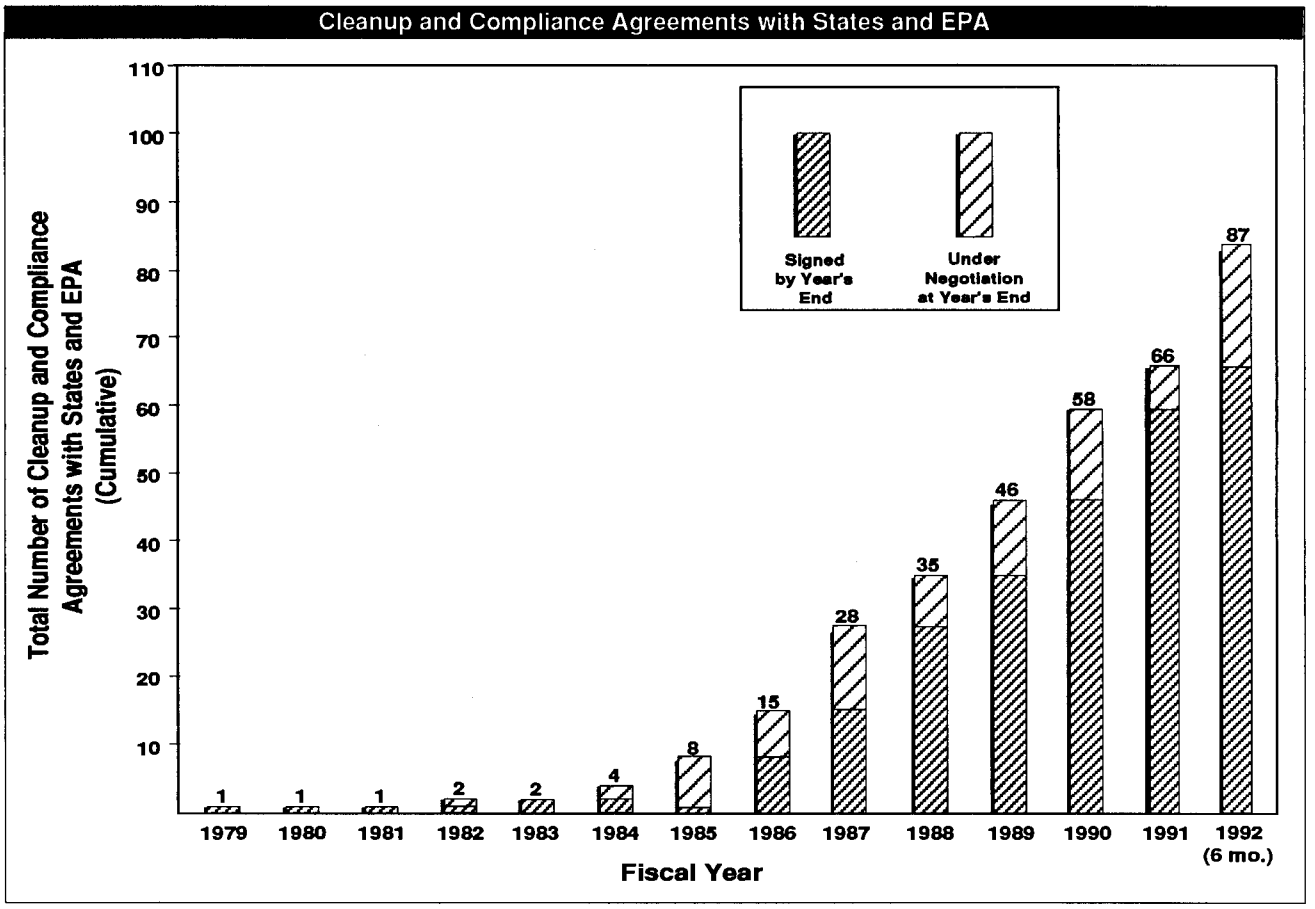


Figure 1.4d. The number of cleanup and compliance agreements with States and EPA has increased significantly since 1979.

Improving Relations with States, Indian Tribes, and Other Federal Agencies

DOE recognizes that effective planning and management of its activities is only possible with the active involvement of States, Tribal Governments, other Federal agencies, and the public. The FY 1993–1997 Five-Year Plan focused on initiatives to improve the relationships among DOE, EPA, States, and Tribal Governments. Continuing these initiatives, EM is incorporating public involvement into many of its activities, as discussed in Section 1.6.2, Credible Decision Making through Public Participation.

Enforceable Agreements

Since 1979, DOE has been negotiating and executing agreements with EPA and State regulatory authorities to ensure that DOE activities will be conducted in compliance with the laws and regulations of EPA and the States. Among these enforceable agreements are Federal Facilities Agreements, Federal Facility Compliance Agreements, Settlement Agreements, and Consent Orders. Their establishment promotes cooperation among signators, allows for negotiation of action plans and schedules to achieve compliance goals, and improves DOE planning and budgeting by defining specific responsibilities, actions, and costs.

From 1979 to mid-1992, DOE executed a total of 87 compliance and cleanup agreements with EPA and/or State regulators, an increase of 21 from mid-1991 (Figure 1.4d). Of the total number of agreements, approximately 20 have been "closed out" with correction of a violation or incorporation of agreement activities into more comprehensive, integrated agreements. Twenty-seven additional agreements are currently being negotiated.

To promote consistency among agreements and to support efficient agreement negotiations, DOE has pursued the establishment of standard, "model" agreement provisions that can be uniformly applied in new agreements. In May 1988, DOE and EPA established model language provisions to be included in their CERCLA agreements, with the intent that these provisions would facilitate the negotiation process and the timely execution of agreement requirements. In the last year, DOE has been working with EPA to revise certain model provisions to improve communication and reduce misunderstanding between the agencies. New language addressing the DOE commitment to seek funding to support the agreements has been developed by DOE, EPA, and the Office of Management and Budget. Additional model language being discussed will specify criteria EPA will use to determine when penalties for agreement violations should be assessed under CERCLA cleanup agreements and will provide informal dispute resolution procedures to address potential compliance problems before a violation occurs.

Additional information about the DOE commitment to regulatory compliance is discussed in Section 1.6.5.

DOE American Indian Policy

A primary initiative of the FY 1993–1997 Five-Year Plan focused on relationships with Tribal Governments. Many EM program activities potentially affect Tribal interests, including site cleanup and waste management, transportation, education, and training. DOE issued the comprehensive American Indian Policy on November 29, 1991. The policy provides broad guidance to strengthen and maintain effective working relationships with Tribes for certain lands and rights of American Indians affected by DOE actions, programs, plans, and decisions. The principles outlined in the policy ensure that Tribal rights and interests are identified and considered in DOE decision making. Several Tribal representatives provided input to DOE during the development of the draft policy, which was then submitted to all Tribal executives for review and comment. Nearly all comments received were concerned with policy implementation. The provisions of the policy are as follows:

1. DOE recognizes and commits to a government-to-government relationship with American Indian Tribal Governments.
2. DOE recognizes a trust relationship derived from the historical relationship between the Federal Government and American Indian Tribes as expressed in treaties and Federal Indian law.
3. DOE will consult with Tribal Governments to ensure that Tribal rights and concerns are considered before DOE takes actions, makes decisions, or implements programs affecting Tribes.
4. Consistent with Federal cultural resource laws, each Field Office or DOE installation with areas of cultural or religious concern to American Indians will consult with them about the potential impacts of proposed DOE actions on those resources and will avoid unnecessary interference with traditional religious practices.
5. DOE has established guidelines to work directly and effectively with Tribal Governments on DOE programs.
6. DOE will work with other Federal and State agencies that have related responsibilities to clarify the roles, responsibilities, and relationships of our respective organizations as they relate to Tribal matters.
7. DOE will incorporate this policy into its ongoing and long-term planning and management process.

The implementation of DOE's American Indian Policy is a complex and ongoing process. The next steps toward implementation of the policy include

(1) establishing points of contact and a communications system for all Tribal interactions related to the EM program; (2) developing, in consultation with the Tribal representatives, elements of protocol for:

- consulting with Tribal Governments on EM activities;
- establishing procedures to work with Tribes to address regulatory issues; and
- addressing overall EM policies for supporting Tribal participation and appropiate levels of related funding; and

(3) providing orientation and training for DOE personnel at Headquarters and Field Offices to facilitate effective interaction with the Tribes.

In addition, EM has proposed negotiating Agreements-in-Principle with Tribes having reserved Treaty rights to lands where DOE facilities are located. These agreements are intended to establish protocols and commitments between EM and the Tribes regarding provision of support and information to facilitate Indian participation in the Five-Year Plan development process and in EM activities at specific DOE sites. Such agreements would support more formalized interactions with Tribal governments and continue the interactions already established with the Yakima Indian Nation, the Nez Perce Tribe, and the Confederated Tribes of the Umatilla Indian Reservation for the Hanford Site; the Shoshone Bannock Tribes for the Idaho National Engineering Laboratory; and other Tribes in the vicinity of DOE facilities.

1.5 RESOURCE PLANNING FOR FUTURE ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT ACTIVITIES

EM planning reflects continued commitment to meeting its legal requirements. Estimates presented in the FY 1994–1998 Five-Year Plan represent a prudent plan based on between five and ten percent growth per year.

The estimates presented in this section support activities driven by legal requirements; other environment, safety and health activities (required by internal DOE Orders); and other desirable activities to ensure effective program management and implementation. These activities include improved financial and business management practices to ensure waste, fraud, and abuse prevention as well as decontamination and decommissioning activities; the implementation of Agreements-in-Principle with States and Indian Nations; and many technology development activities.

The estimate for environmental restoration and waste management activities for FY 1994 is $6.1 billion, of which 62 percent is legally driven; 24 percent is for other environment, safety and health activities; and 14 percent is allocated for other desirable activities (Figure 1.5a).

While these estimates represent an assessment of the costs of meeting legal requirements and also carrying out other desirable activities, there are significant uncertainties that are built into these estimates that may require adjustments. Uncertainties exist regarding the scope and timing of additional environmental restoration, waste management, technology development, and transition projects that could result in additional funding requirements. These uncertainties relate to the sequential regulatory compliance procedures, non-uniform regulatory requirements, availability of critical technologies, unanticipated delays in the completion of site characterization activities, and the absence of independently validated cost estimates and other factors. DOE intends to manage these uncertainties by reallocating budgetary resources, requesting funds through the normal appropriations process, requesting supplemental appropriations when necessary, reprogramming to facilitate critical milestone completion when possible, and applying conflict resolution procedures when absolutely necessary.

For FY 1994–1998, the Five-Year Plan assumes growth of between five and ten percent per year. The actual FY 1994–1998 budget requests will likely differ from these initial planning estimates. Several factors might account for any differences, such as final actions on the FY 1993 budget, reprioritization actions by DOE or the Office of Management and Budget, shifting program responsibilities within DOE, regulatory or legal actions, physical events at the facilities, or Congressional direction.

Funding for the EM program is appropriated by Congress in two separate accounts. The Defense Environmental Restoration and Waste Management account within the Atomic Energy Defense Activities Appropriation—referred to as the

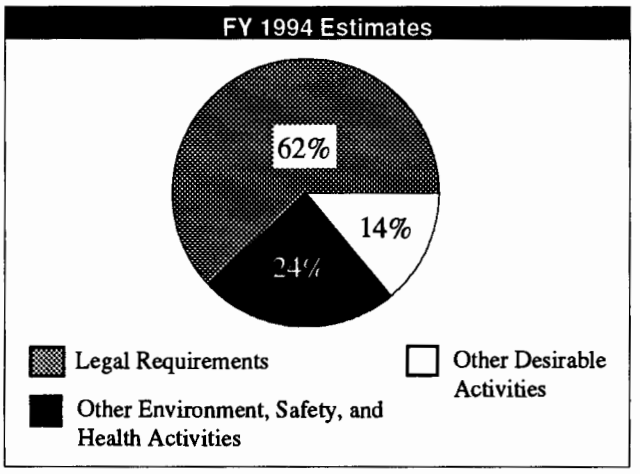


Figure 1.5a. The EM program is driven by legal requirements and also includes environmental, safety and health activities and other desirable activities. Technology development is included as part of the other desirable activities.

"defense account"—comprises almost 90 percent of the EM budget. The Energy Supply, Research and Development Appropriation —the "nondefense account" —provides support for the remaining environmental restoration and waste management activities.

This section discusses estimates for all of EM and for each major EM program: Waste Management; Environmental Restoration; Technology Development; and Facility Transition and Management. Estimates by installation appear in Volume II, Installation Summaries. Figure 1.5b illustrates the projected growth in the EM program over the five-year planning period for both the defense and nondefense accounts, not including facility transition activities.

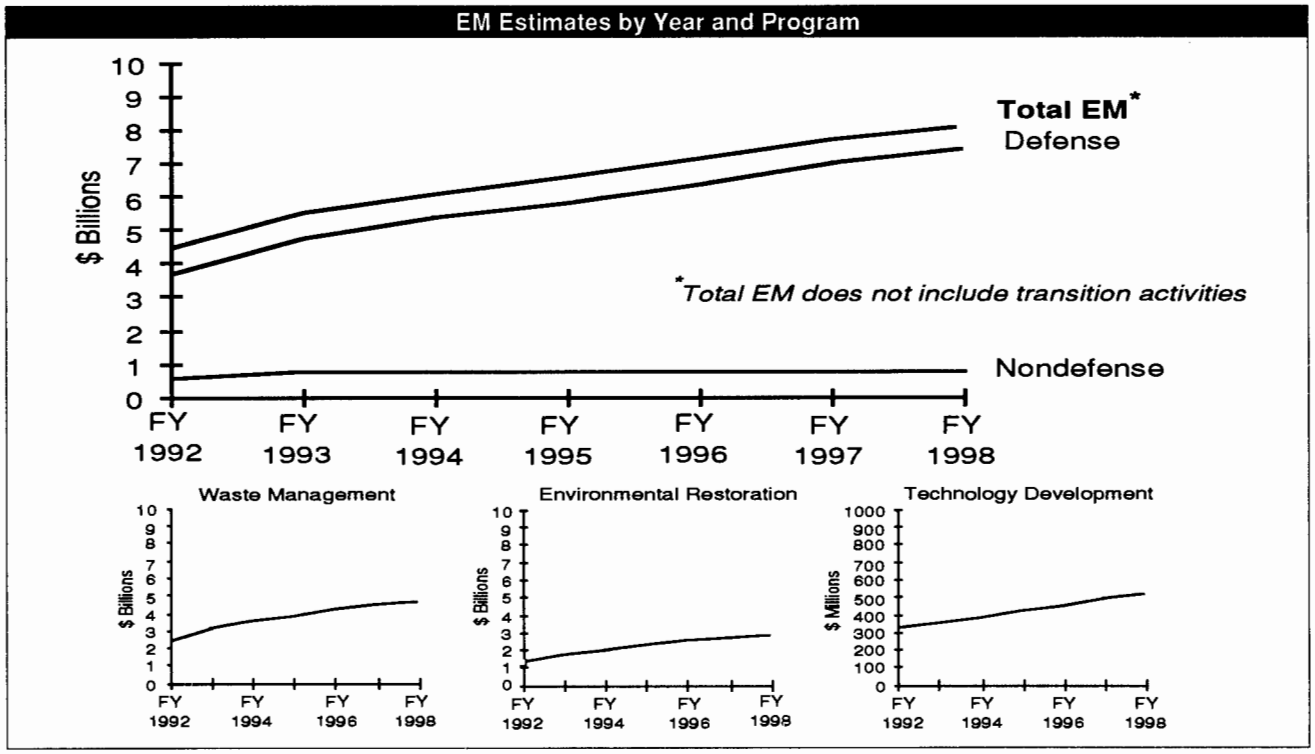


Figure 1.5b. Defense account environmental restoration and waste management activities make up the bulk of the EM program. Waste Management includes corrective activities and Technology Development includes transportation management. Only EM-funded and managed activities are included.

Program Estimates

The EM estimates can be broken out for each of the five major program areas. Figure 1.5c identifies projected funding estimates for each program, breaks out estimates between defense and nondefense accounts, and shows the amount of funding allocated across the four major priority categories. This chart also displays the amount of funding for each EM program that is tied to legal requirements, DOE Orders, and other critical program management activities.

DOE Estimates by Program (in billions)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Waste Management	$2.56	$3.27	$3.54	$3.80	$4.13	$4.51	$4.60
Environmental Restoration	1.38	1.85	2.07	2.30	2.48	2.68	2.74
Technology Development	0.32	0.38	0.37	0.40	0.45	0.49	0.50
Program Direction	0.02	0.05	0.05	0.06	0.06	0.07	0.07
Subtotal	4.28	5.55	6.03	6.56	7.12	7.75	7.91
Transition Activities	0.00	0.02	0.02	0.02	0.02	0.02	0.02
Total	4.28	5.57	6.05	6.58	7.14	7.77	7.93
Defense	3.68	4.86	5.34	5.87	6.43	7.06	7.22
Nondefense	0.60	0.71	0.71	0.71	0.71	0.71	0.71
EM Subtotal	4.28	5.57	6.05	6.58	7.14	7.77	7.93

FY 1994 EM (in billions)

	Legal Requirements	Environment, Safety and Health	Other Activities
WM	$2.00	$1.28	$0.26
ER	1.71	0.17	0.19
TD	0.04	0.01	0.32

Figure 1.5c. In estimates above, Waste Management includes Corrective Activities; Technology Development includes Transportation Management. EM-funded and -managed activities only are included.

Waste Management

The Waste Management Program includes treatment, storage, and disposal of radioactive, hazardous, mixed, and sanitary waste and spent fuel generated by DOE activities. Many waste management efforts are dedicated to addressing the backlog of stored waste and new waste generated by EM cleanup. Corrective activities required to bring specific sites into compliance are also included in the Waste Management Program. Estimates for FY 1994 are displayed in Figure 1.5d and in 1.5c for FY 1992–1998.

Among the major uncertainties affecting the Waste Management Program are the number of disposal facilities that will be located at Oak Ridge National Laboratory; mixed waste characterization requirements; treatment requirements for low-level/ mixed radioactive waste at Savannah River and Richland; the number and design requirements for tank safety upgrades at Richland; the extent of treatment, if any, required for mixed transuranic waste to satisfy Waste Isolation Pilot Plant waste acceptance criteria; the final design, timing, and the technical need for the Hanford Waste Vitrification Plant; and final RCRA compliance solutions for problems as they develop.

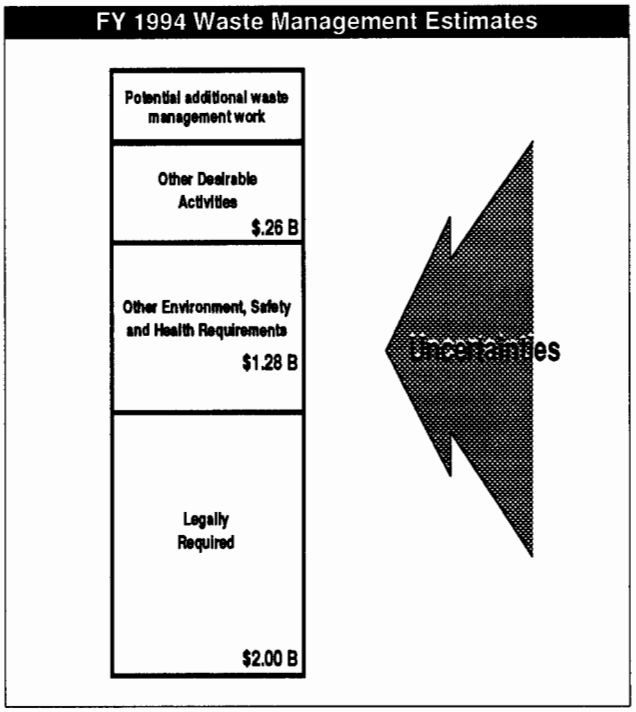


Figure 1.5d. Planned activities may be affected by uncertainties, including the number of required storage facilities and waste treatment requirements.

Environmental Restoration

The Environmental Restoration Program has grown steadily for several years. This program conducts remedial actions and decontamination and decommissioning projects to reduce and remove potential risks to the environment and to human health and safety. Currently, many of the program's efforts are related to assessing the extent and nature of contamination. Estimates for FY 1994 are displayed in Figure 1.5e and in Figure 1.5c for FY 1992–1998.

Uncertainties related to environmental restoration activities include the timing of site investigation and remediation activities that are dependent on validated cost estimates, the sequencing of CERCLA and RCRA regulatory reviews and approvals, the addition of new or modified regulatory requirements, and the availability of required technologies. A central challenge facing EM is the need to develop new technologies that will assist DOE in cleaning up its sites faster, better, safer and in more cost-effective ways. The window of opportunity to impact costs through technology development is relatively narrow. As illustrated in Figure 1.5f, for example, for the remediation of volatile organic compounds (VOCs) in arid soil, the majority of Records of Decision (RODs) are scheduled to be completed by 1995. To impact these decisions, new technologies should be in place in advance. The situation is similar across EM facilities.

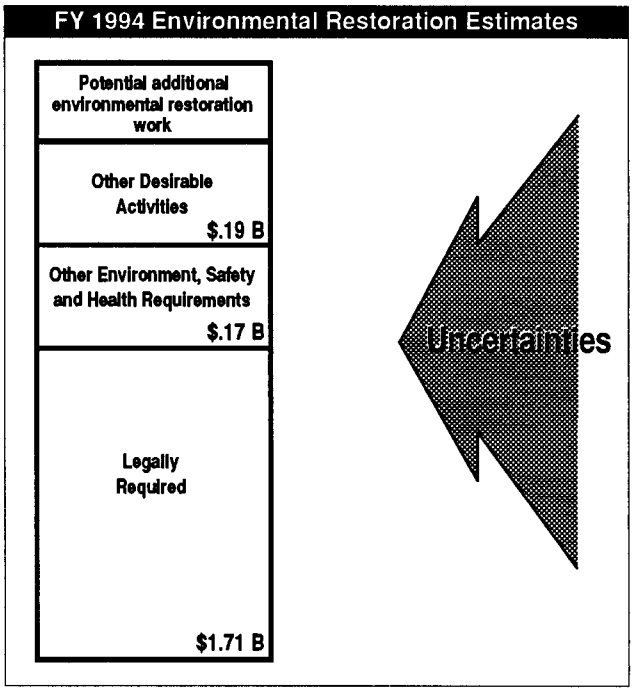


Figure 1.5e. Planned environmental restoration activities may be affected by uncertainties, including sequential regulatory compliance procedures and availability of new technology procedures.

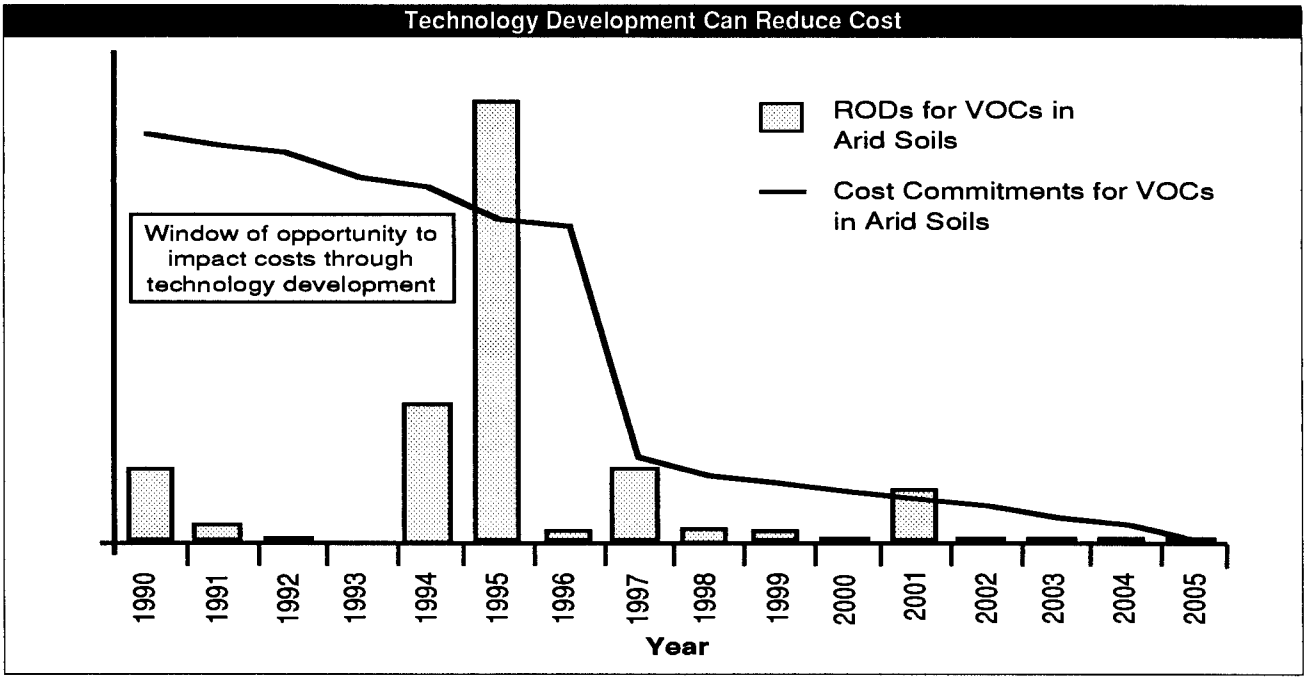


Figure 1.5f. Remedies selected for many sites (reflected in RODs) may be very costly without development of new technologies.

Technology Development

The Technology Development Program's mission is to establish and maintain an aggressive national program that will rapidly advance technology for site restoration and waste management beyond current capabilities. Even though the estimates for this effort are small relative to the entire EM program, technology development is a vital facet of DOE's environmental restoration and waste management efforts.

Uncertainties pertaining to DOE technology development efforts are a function of its dynamic and experimental nature. In this respect, the results of integrated demonstration projects may suggest the need for supplemental technology development tasks or the need for additional demonstration projects. The dynamic nature of technology development also poses unique challenges to those who manage technology development activities. New and innovative technology systems must be implemented to either bridge the gaps in available cleanup technologies or to develop new technologies that will offer significantly greater benefits than systems that are currently available. Benefits from technology development may be expressed in terms of cost reductions, timeliness of remediation, and enhanced public and worker safety. As suggested in Figure 1.5f, the window of opportunity for technology development to impact the costs of remediation is relatively narrow. Figure 1.5c displays estimates for technology development over the five-year planning period.

Facility Transition and Management

As the DOE defense mission changes, EM will acquire the responsibilities for facilities that formerly belonged to the nuclear weapons program and other DOE elements. Recognition of these new responsibilities has resulted in the creation of a new initiative and prioritization within EM to manage the transition process. Several sites have already been transferred to EM for deactivation and disposition. Substantial uncertainties exist regarding the timing of transfers and the identification and designation of surplus facilities. For example, transfers from Defense Programs alone could amount to approximately $500 million (Figure 1.5g). Negotiations are currently under way regarding the transfer of facilities—and resources to support them—from other DOE programs.

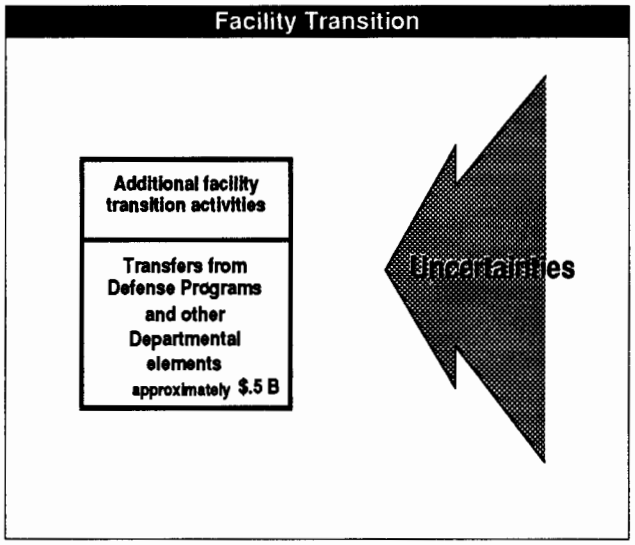


Figure 1.5g. Planning for facility transfer activities may be affected by uncertainties, including timing of transfers and identification and designation of surplus facilities.

Environmental restoration and waste management funding requirements also include landlord activities. Within DOE, landlord responsibility is assigned to the program that accounts for the major activities conducted at each site. As a result of EM's growing responsibilities throughout the weapons complex, its landlord responsibilities are also increasing. Further information on EM landlord responsibilities is provided in Section 1.6.3.

1.6 OBJECTIVES FOR ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT

The Environmental Restoration and Waste Management Strategic Plan, the planning and policy framework for the program, embodies a set of key objectives designed to address the issues that must be resolved to accomplish the DOE environmental mission.

The Environmental Restoration and Waste Management Strategic Plan (Appendix C) outlines a framework for specific objectives to accomplish the DOE waste management and environmental remediation mission. This framework encompasses sustained excellence in environmental restoration and waste operations activities, supported by state-of-the-art, cost-effective, cradle-to-grave technologies, and paced by comprehensive land-use planning.

Specific objectives, as well as the activities, accomplishments, milestones, assumptions, issues, and strategies that affect the ability of DOE to achieve its vision of the future, are discussed in Sections 1.6.1 through 1.6.9. DOE's progress toward meeting these specific objectives is illustrated through a discussion of key accomplishments and a comparison of these accomplishments with EM's prior commitments. Strategies designed to resolve critical issues are also presented, along with milestones to be met to fulfill these strategies.

The crosscutting objectives discussed below are:

- improving credible decision making through sound planning and public participation;
- effecting facility transfer, acceptance, deactivation, and disposition;
- eliminating unacceptable risk;
- achieving regulatory compliance;
- implementing pollution prevention;
- developing human resources and capital assets;
- providing for efficient use of resources; and
- providing a safe workplace and protecting public health.

Following the discussion of these crosscutting objectives, Part 2 presents specific programmatic objectives as part of the program plans for waste management; environmental restoration; facility transition and management; technology development; and transportation and emergency management.

1.6.1 CREDIBLE DECISION MAKING THROUGH SOUND PLANNING

EM will improve the credibility and effectiveness of DOE decision making through implementation of an integrated, documented planning process.

Credible program decision making depends on planning that forces identification of critical issues, cooperative development of alternative resolution strategies, and implementation of concrete and workable solutions. Planning helps decision makers discern what must be accomplished and in what order. Credible decision making also requires the integration of public participation processes into DOE planning and management structures.

This section describes how EM planning processes contribute to better decisions, enhanced performance, and most importantly, concrete progress. It also identifies planning issues that, if not resolved, could significantly impede program progress.

Status of Planning Efforts for Environmental Restoration and Waste Management

Comprehensive planning efforts guide key DOE management and budgetary decisions. This planning includes strategic planning and development of site-specific plans, roadmaps, and the annually updated Five-Year Plan. These are also discussed briefly in Section 1.0 and in greater detail in Appendix I.

Roadmaps

While strategic planning is critical to establishing fundamental goals and objectives, roadmaps highlight obstacles to program success at the installation and project levels. Roadmaps are based on "bottom up" planning at the installation or project level and focus principally on issues that hinder progress and strategies for resolving them. In Phase I of the roadmapping process, 25 consolidated issues were identified which, if not resolved, could adversely affect program progress. For example, roadmaps identified the need for a complexwide strategy to help small-volume low-level waste and low-level mixed waste generators, such as the Fernald Environmental Management Project, access treatment facilities at other sites. Other issues identified by roadmaps include the lack of an integrated national strategy for management of low-level waste and mixed low-level waste; the need to better integrate the requirements of the National Environmental Policy Act (NEPA) into the CERCLA process as well as integrating the RCRA/CERCLA processes; the need to begin integrating NEPA into the RCRA requirements; and the inadequacy of current RCRA requirements for managing low-level waste.

Roadmaps are helping program managers identify and effectively respond to critical environment, health, and safety issues, such as the single-shell storage tank problems at Hanford and the need for thorium storage facilities at Fernald. Roadmaps are also helping program managers identify potential obstacles to meeting compliance agreement milestones, such as the need for technology development to better coordinate with waste management and environmental restoration schedules.

National Environmental Policy Act-Based Planning

The magnitude and complexity of the cleanup and waste management tasks that face DOE require systematic analysis. The Programmatic Environmental Impact Statement (PEIS) is the major planning initiative for conducting this analysis. EM is coordinating this initiative closely with Defense Programs, which is preparing a separate PEIS for a streamlined weapons complex. Like other planning initiatives that drive DOE decision making, these efforts are referenced throughout this plan.

The EM Programmatic Environmental Impact Statement is being developed consistent with the letter and spirit of NEPA. The purpose of the PEIS is to provide a broad environmental analysis of programs and policies to evaluate environmental, public, and worker health effects when waste cleanup, storage, and disposal actions are connected and may have cumulative impacts. The potential impacts that will be evaluated include a broad assessment of risk (e.g., near-term, transportation, long-term residual risk, and treatment); land, water, and energy resource impacts; potential recycling impacts; environmental impacts; and socioeconomic impacts. The PEIS will address national, programwide alternatives rather than site-specific actions. Subsequent NEPA documents will address site-specific and project-specific actions. Several issues are considered in the PEIS process and within the context of the proposed action and alternatives. These issues include land use, cleanup levels, the costs and benefits of implementing each cleanup alternative, national policy, and local preferences. DOE is trying to ensure a high level of stakeholder and public involvement in every stage of the PEIS development process.

An earlier planning effort, the EM Configuration Study, has been fully incorporated into the EM PEIS to ensure that all siting analyses are performed within the NEPA context.

The EM PEIS will analyze reasonable alternatives to siting DOE waste management facilities and will describe related environmental impacts. In accordance with the NEPA process, the Waste Management Program will incorporate these analyses with operational analyses and detailed cost comparisons prior to reaching decisions on new waste treatment and disposal strategies.

Documentation of recent environmental management accomplishments and specific near-term goals, activities, and commitments at the DOE sites is part of each Five-Year Plan. Future plans will be analyzed within the context of site-specific NEPA documentation. The development of the PEIS under NEPA will provide additional programmatic guidance by establishing long-range policy for conducting program activities. The complexwide analysis of cleanup alternatives to be included in the EM PEIS may identify the need for changes to future site-specific projects and other activities. These changes, if they affect site-specific activities, will be reflected in future editions of the Five-Year Plan.

Three Critical Planning Milestones

Effective planning requires four capabilities:

- the ability to anticipate, articulate, and communicate critical interrelationships in work scope, cost, and schedule;
- the ability to track program progress so managers can make timely policy and management adjustments to avoid serious schedule delays and cost impacts;

- the ability to allocate finite budgetary resources in a manner that maximizes return or achievement of objectives, reduces risk and is equitable; and
- the ability to systematically identify and resolve program issues before they become fundamental obstacles to progress.

These objectives are evident in three critical milestones relating to the development of an integrated, documented planning process.

Complete Program and Project Baselines

The *technical baseline* documents the requirements needed to achieve a stated mission. The *schedule baseline* identifies activity durations and milestones to depict the status and completion of parts and the whole of the mission. Finally, the *cost baseline* estimates the total cost to complete the technical scope of work according to schedule. Development of these baselines is critical to establishing sound planning estimates that support Activity Data Sheets (ADSs). One element of this triad cannot be changed without affecting the other two elements.

Status: Preliminary baselines have been established for most environmental restoration projects. The Waste Management Program baseline system should become operational in FY 1993. Changes to baselines, once established, are documented and controlled through a formal change control process to ensure management attention, in accordance with the Interagency Review Group findings.

Implement Progress Tracking System

As discussed in Section 1.4, EM has developed a system that tracks milestones, program activities, accomplishments, and resources. The Progress Tracking System will apply an earned value methodology that measures budgeted costs of work scheduled to actual costs of work performed. In accordance with the second recommendation of the Interagency Review Group, the Progress Tracking System will constitute a budget execution plan when fully implemented because it will track progress against expenditures.

Status: Phase I of the system was completed in FY 1992 and allows tracking of milestone status and monthly expenditures. Phase II, which incorporates a fully operational tracking system with the capability to provide earned value, is projected to be in place during FY 1993.

Complete Phase I Roadmaps

Completion of programmatic and waste stream roadmaps will assist decision makers in resolving critical issues that could impede achievement of DOE's 30-year goal.

Status: During 1992, waste stream roadmaps were completed for high-level, low-level hazardous/ sanitary, and transuranic waste streams at a number of DOE facilities. Thirty roadmaps were prepared to address selected waste streams at Battelle Columbus Laboratories, Idaho National Engineering Laboratory, West Valley Demonstration Project, Oak Ridge National Laboratory, Savannah River Site, Los Alamos National Laboratory, Mound, Sandia National Laboratories-Albuquerque, Sandia National Laboratories-Livermore, Nevada Test Site, Rocky Flats Plant, Kansas City Plant, Pantex, Pinellas, Energy Technology Engineering Center, and Lawrence Berkeley Laboratory. An additional 18 environmental restoration roadmaps were prepared for Battelle Columbus Laboratories, Idaho National Engineering Laboratory, West Valley Demonstration Project, Fernald Environmental Management Project, Formerly Utilized Sites Remedial Action Program, Oak Ridge National Laboratory, Savannah River Site, Los Alamos National Laboratory, Mound, Sandia National Laboratories-Albuquerque, Sandia National Laboratories-Livermore, Nevada Test Site, Weldon Spring, Rocky Flats Plant, Hanford, and the Uranium Mill Tailings Remedial Action Project.

During FY 1993, 35 roadmaps will be updated, consolidated, and developed. Facility transition and other emerging issues will be included.

Issues and Strategies

Institutionalizing a Sound Planning and Management Culture

Innovative planning processes have been initiated to improve overall program performance. For example, the rigorous cost and scheduling innovations in effect during FY 1993–1997 Five-Year Plan development facilitated the development of ADSs tied to concrete program needs and priorities. Program activities must be tied to legal drivers and prioritized in terms of environmental, safety, and health concerns. In this way, EM will continue to build credibility with the public.

The interrelationships among the Cost Quality Management Program system, the Progress Tracking System, EM's planning and prioritization systems, ADSs, and the annual internal budget development process are illustrated in Figure 1.6.1 and discussed in Appendix I.

Building a Consensus on Land Use

As described in Sections 1.3 and 1.6.4, determining "how clean is clean" is an important question for the EM program. Regulators, affected Indian Tribes, and local citizens often have dramatically different conceptions and expectations regarding cleanup standards. To a large extent, this issue revolves

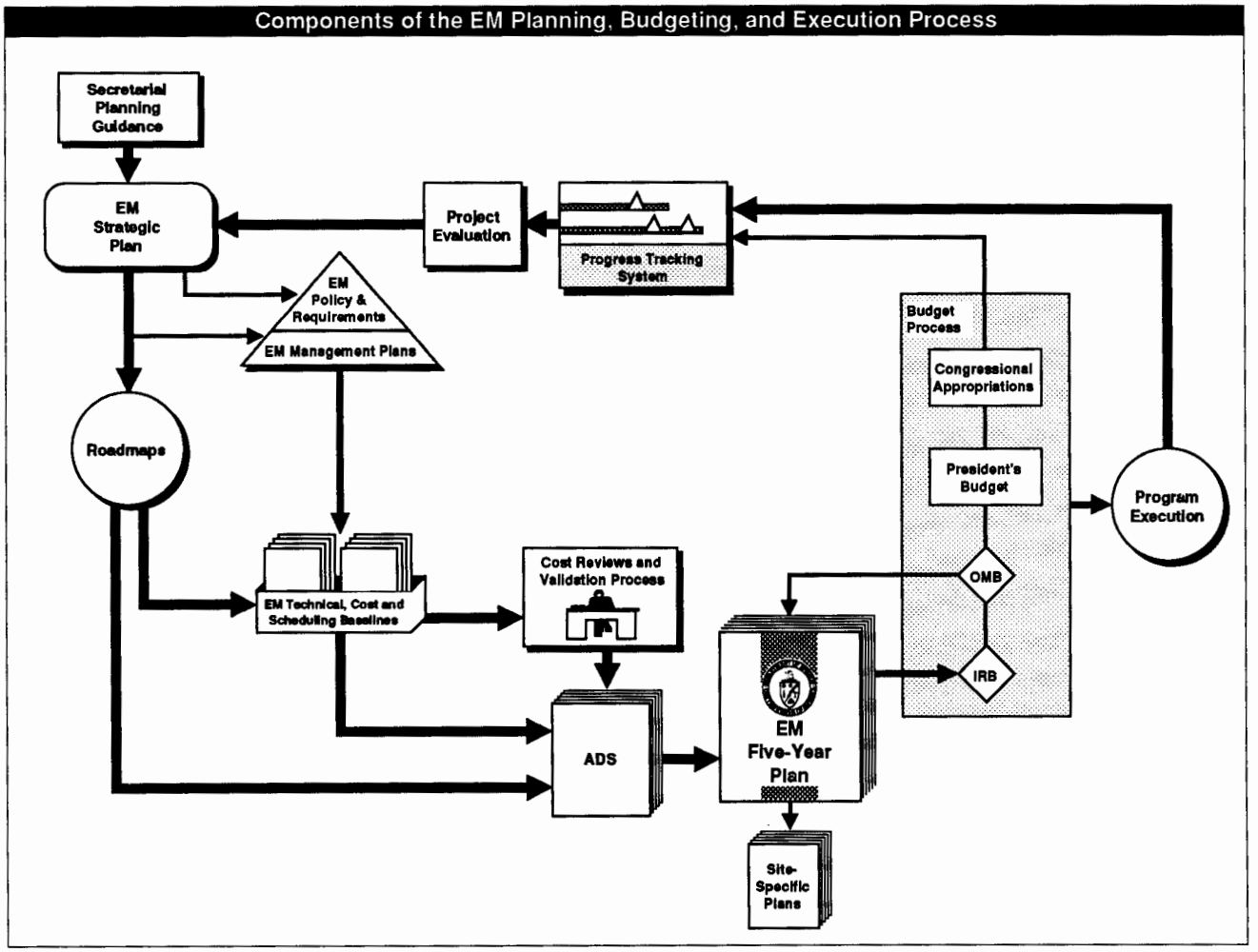


Figure 1.6.1. EM comprehensive planning efforts guide key management and budgetary decisions.

around differing expectations. For example, while certain parties may accept reduced access to a contaminated site as an appropriate alternative to higher cleanup costs, others may view restricted access as a cultural infringement. As the transition from weapons production to decommissioning accelerates, unresolved debates regarding the ultimate uses of the land and associated cleanup levels could become serious impediments to program progress. In recognition of the expanding DOE mission and the lack of a clear-cut definition of "how clean is clean," DOE is in the process of instituting planning that will focus on alternative land-use options. Efforts to establish health-based cleanup standards, discussed in Section 1.6.4, will also support land-use decisions.

EM is carefully studying alternatives for incorporating land-use planning methods into its current site-specific and Five-Year Plan development activities. These efforts are discussed further in Section 1.3.

Integrating Planning Processes

EM must ensure that its planning and decision-making methods are developed in a unified and coherent fashion and that site-specific planning needs are met in a comprehensive and useful manner. To this end, EM intends to use tools such as roadmaps to identify critical programmatic issues. Planners are working to integrate analyses conducted at different levels across the complex to produce more consistent, comprehensive planning estimates.

Roadmaps will also facilitate evaluations of trade-offs between taking timely action and the potential for future cost savings from technology development. Expected progress in technology development can be charted against schedules for environmental restoration activities via roadmaps to highlight schedule conflicts. These evaluations will also consider increased cost if no action is taken until technology matures, the potential for increased worker exposure and ecological damage, and the feasibility of alternative actions.

1.6.2 CREDIBLE DECISION MAKING THROUGH PUBLIC PARTICIPATION

Meaningful, predecisional opportunities for public participation will improve the credibility and effectiveness of DOE decision making.

Credible decision making requires the integration of public participation with planning and management structures (Figure 1.6.2). While both Headquarters and Field Offices have launched a number of initiatives to strengthen public participation and understanding of environmental restoration and waste management activities, the success of these initiatives has varied from site to site and from activity to activity.

Status of Public Participation Efforts

In March 1989, Secretary of Energy James D. Watkins outlined his vision for a change in DOE culture. This change committed DOE to creating a culture of openness, responsiveness, and accountability and to providing opportunities for early, substantive public participation in EM program planning and implementation. The implementation of this culture change is an ongoing process. In October 1992, the Assistant Secretary for EM signed the EM public participation policy, confirming this commitment. Developing mechanisms to fully integrate the input and concerns of affected and interested parties into program planning and implementation will be a long-term process of trial and error. The goal is to create an open, accessible, and fair decision-making process that provides opportunities for the public to assist DOE in identifying issues and problems and in formulating and evaluating alternative courses of action. This process will result in informed decisions that address issues of concern to the public. However, DOE will still retain final decision-making responsibility and accountability.

DOE's commitment to openness, responsiveness, and accountability is evident in the variety of participation opportunities in a broad spectrum of DOE activities. Today, virtually no aspect of the EM program is without a provision for stakeholder and public involvement, and every Field Office has initiated new public participation activities.

Participation in some program areas, such as transportation, has been ongoing for years, well before the establishment of EM. Several Field Offices have long-standing public participation programs. Involvement in other program areas is just beginning or is in the planning stages, and some Field Offices are only now developing public participation programs. Each Field Office is also evaluating the effectiveness of various formats for public involvement and sharing lessons learned with other DOE organizations.

DOE has taken steps to encourage increased participation in the Five-Year Plan development process. To obtain input to the FY 1993–1997 Five-Year Plan, Field Offices held public meetings in March 1991. Some of these meetings were not successful in eliciting active public participation in EM planning. Based on last year's experience, the FY 1994–1998 Five-Year Plan Guidance to Field Offices required development of Public Participation Action Plans. These plans were intended to allow Field Offices to develop public participation activities tailored to individual site needs, while consistently bettering the overall quality of public participation. Activities conducted by Field Offices included creation of working groups, public workshops, development of newsletters and other educational tools, and review and comment opportunities on various components of the Five-Year Plan development process.

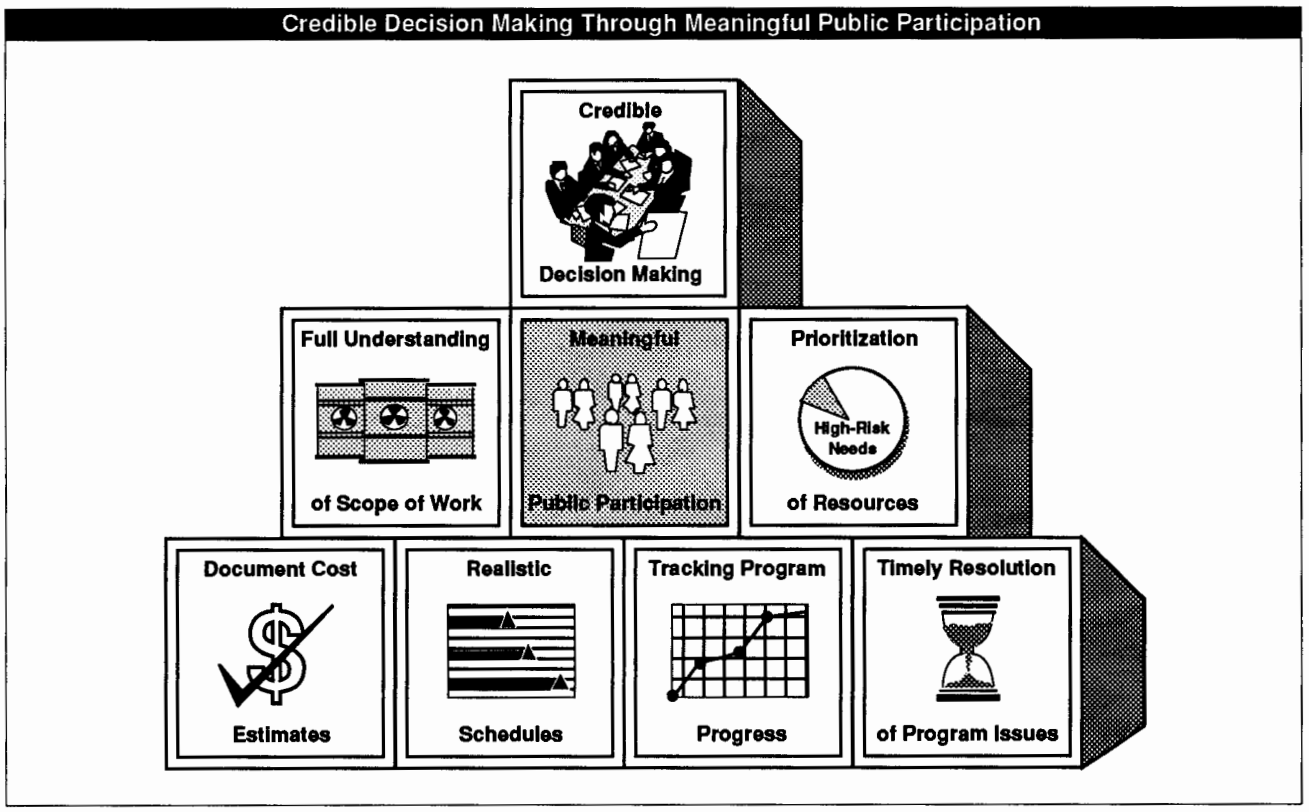


Figure 1.6.2. Credible decision making rests on several critical building blocks, including meaningful public participation.

State and Tribal Government Working Group and Stakeholders' Forum

While site-specific efforts to encourage participation at the local levels have varied in their success, the State and Tribal Government Working Group (STGWG) and the Stakeholders' Forum have made significant contributions to the Five-Year Plan development process. The fact that the FY 1994–1998 Five-Year Plan focuses more on accomplishments, milestones, issues, and strategies is largely the result of STGWG, Stakeholders' Forum, and public comments on the FY 1993–1997 Five-Year Plan. In addition, for the first time, DOE has published a separate Comment Response Document, including responses to comments received on the FY 1993–1997 Five-Year Plan.

STGWG's membership includes 17 States, five Indian Tribes, three organizations representing State interests, and the Office of Management and Budget. The Stakeholders' Forum is composed of interested parties from various governmental organizations and representatives of labor, business, environmental and other public interest groups.

In creating STGWG in 1989, the Secretary of Energy envisioned that the group would play a critical predecisional role in Five-Year Plan development activities. Consistent with the Secretary's vision, STGWG members received copies of the proposed outline for the FY 1994–1998 Five-Year Plan and early drafts of the Activity Data Sheets. Some STGWG members feel their review of these early draft Activity Data Sheets was hampered by the lack of cost information.

STGWG and the Stakeholders' Forum also received a predecisional draft of this Five-Year Plan in May 1992 and STGWG reviewed a revised draft in December 1992. Responses to STGWG and Stakeholders' Forum comments on the predecisional versions of the FY 1994–1998 Five-Year Plan are included in Appendix J.

Comment Response Document

While STGWG and the Stakeholders' Forum play key roles in predecisional planning, public comment on the Five-Year Plan after it is released is also important and can have a significant effect on EM programs and future versions of the Five-Year Plan. DOE produced the first Five-Year Plan Comment Response Document in 1992. One hundred sixty-seven written comments were received from 33 concerned groups and individuals on the FY 1993–1997 Five-Year Plan. Input from these comments was used in the development of the FY 1994–1998 Five-Year Plan and are addressed in the Comment Response Document. Comments were broken down into six major categories: funding and priority setting, commitment to regulatory compliance and reducing risk, public involvement and education, planning and management initiatives, site-specific, and organization and structure. The comments ranged from confusion over the two planning scenarios used in the plan to frustration over the large number and excessive use of acronyms in the plan to suggestions for public involvement for EM activities. DOE continues to encourage public comment on the plan.

Student Five-Year Plan Activities

To increase public participation and make the Five-Year Plan easier to read, DOE initiated a student review program in 1991. This program invited high school honor students from across the country to review and comment on the FY 1993–1997 Five-Year Plan. The program included 105 students from 24 high schools across the United States. Overall, student reactions to the plan were favorable. Suggestions included shortening the plan and using more understandable language. The students also posed questions concerning funding priorities, regulatory issues, and whether DOE has an animal rights policy regarding scientific experimentation. Because of the students' concern over treatment of animals at DOE facilities, information on this issue has been included in the Installation Summary for the Albuquerque Field Office's Inhalation Toxicology Research Institute, contained in Volume II.

Due to the success of the student review program, DOE invited four of the Washington, D.C., area high school students who participated in the student review of the FY 1993–1997 Five-Year Plan to write a student edition of the FY 1994–1998 Five-Year Plan. These students worked as DOE summer interns and wrote, designed, and produced a 17-page, four-color version of the Five-Year Plan. The student edition of the plan was written to give students, educators, and the public a basic explanation of the contents of the more technically-oriented EM FY 1994–1998 Five-Year Plan and to spark students' interests in careers related to environmental restoration and waste management.

Public Involvement in the Programmatic Environmental Impact Statement Process

The Programmatic Environmental Impact Statement (PEIS) process under the National Environmental Policy Act provides an important mechanism for facilitating meaningful public involvement in program planning and decision making. On October 22, 1990, DOE issued a Notice of Intent to prepare the EM PEIS and asked for public comments on its scope. A workshop was held on November 19, 1990, to provide an opportunity for DOE officials and representatives from national organizations to discuss the proposed scope of the PEIS and the ways public participation in scoping could be more effective. During the winter of 1990–1991, EM held 23 public scoping meetings to hear testimony and also received many written comments. DOE analyzed more than 20,000 comments from the meetings to establish the scope of the PEIS.

EM prepared the draft PEIS Implementation Plan, which incorporates the results of the scoping process, an explanation of proposed DOE programmatic actions, and alternatives for cleanup and remediation to be discussed and analyzed in the PEIS. The draft Implementation Plan has been publicly reviewed through solicitation of public comments, and a series of six regional interactive public workshops that were held in March and April 1992. These meetings were structured to encourage communication between participants and senior EM representatives and to

solicit individual viewpoints. Participants were divided into small breakout groups to discuss comments on topics related to the draft PEIS Implementation Plan. The interactive workshop format was successful in stimulating dialogue between workshop participants and DOE. All comments from the public will be considered and entered into a comment-tracking system for reference.

Based on the review of the written comments and public input at the workshops, DOE will revise the Draft Implementation Plan and issue a Final Implementation Plan. Once the Draft EM PEIS is prepared, its availability for review will be announced, it will be distributed for review, and public meetings will be held to receive comments. All comments received at the meetings and written comments will be entered into a comment-tracking system and incorporated into the Final PEIS as appropriate.

DOE has established a national advisory committee under the Federal Advisory Committee Act to consider the scope, planning, and process for developing the PEIS and other issues. The Environmental Management Advisory Committee (EMAC) includes three representatives of site-specific groups, local and State governments, Indian Tribes, regulatory agencies, national environmental groups, labor, academic, and industry groups. EMAC began meeting in August 1992.

Other Public Participation in EM Planning

This year's planning cycle was designed to increase public participation in Five-Year Plan development activities. The preliminary plan, for instance, is issued for a formal comment period announced by a *Federal Register Notice*. This final Five-Year Plan will include a supplemental volume that lists and responds to public comments on the preliminary plan and describes how the plan was revised based on those comments. Field Offices are continuing to hold public meetings and workshops on their Site-Specific Plans, which are revised annually. Additional public meetings have also been held on the environmental restoration and waste management prioritization systems.

Several Field Offices have established site-specific advisory or working groups that provide substantive input to their programs. For example, the Rocky Flats Technical Review Group includes participants from area municipalities, local environmental groups, DOE, EPA, the Colorado Department of Health, and technical staff from the facility. The Technical Review Group meets at least monthly to participate in draft work plan review sessions related to environmental restoration projects at the installation.

The DOE Richland Field Office coordinates with a review group that includes representatives of Washington, Oregon, three Indian Tribes, and EPA. In addition, Richland has convened a Future Site Uses Working Group that has been meeting each month to address land-use issues. This group includes representatives of Federal and State agencies, Indian Tribes, local governments, and local agriculture, business, labor, environmental, and interest groups. Several sites under the jurisdictions of the DOE Chicago and San Francisco Field Offices have working groups composed of local government, public interest, industry, and education representatives.

The DOE Fernald Site has also made use of an advisory group, but it has been more successful in emphasizing direct communication with affected groups. Fernald sends representatives to the regular meetings of local government and the citizen group, Fernald Residents for Environment, Safety, and Health (FRESH). The site also holds frequent public workshops, roundtables, and classes dealing with topics of special interest to the public. This direct one-on-one communication has helped DOE respond to community concerns.

The Transportation Management Program recently established a DOE Transportation Emergency Preparedness Program External Coordination Working Group, including representatives of several DOE offices, States, Indian Tribes, local governments, and industry groups. Individual Tribes are represented through various national organizations. At present, the Council of Energy Resource Tribes and the National Congress of

American Indians are working group members. The group's first meeting was in April 1992. This group will provide guidance to the DOE-wide steering committee on transportation-related issues and concerns. Affected and interested parties have been involved in many aspects of transportation planning and programs through participation in meetings and workshops, working groups, emergency response orientation training, training exercises, and through cooperative agreements with the Western Governors' Association, the Southern States Energy Board, and several Indian Tribes.

Issues and Strategies

Variability in Quality of Public Participation Programs

While DOE has provided a wide variety of public information products and public involvement opportunities, ensuring a truly open participative process will require much additional work. There is significant variation in the extent and intensity of stakeholder and public participation across program areas and among Field Offices. EM has identified a need for greater and more substantive participation opportunities and for improved communication and coordination among programs and between Headquarters and Field Offices. Lack of coordination can result in duplication of participation initiatives, inefficient scheduling of public meetings, and inability to effectively communicate program progress to key stakeholders. Another serious problem has been a lack of information transfer among Field Offices regarding successful programs and initiatives.

Improved Coordination

Several efforts to improve communication and coordination have been initiated, including the creation of a new EM Office of Policy and Program Information in December 1991. This office serves as a central coordination point for participation activities among EM program offices, with other DOE offices, and between DOE Headquarters and the Field Offices. One of its key objectives is to achieve a greater level of effectiveness and consistency for stakeholder and public participation in planning and decision making across all DOE operations, while retraining the focus of public participation at the local level where it is most effective. Activities of the Office of Policy and Program Information include: identification of DOE public participation contacts for each EM Headquarters program area and at each DOE Field Office, weekly mailings, monthly Headquarters coordination meetings, quarterly Headquarters and field workshops, development of a public participation training program and development of EM-wide public participation policy and guidelines.

Using Working Groups and Advisory Panels to Build Credibility

To boost public confidence, DOE is emphasizing participation in working groups and advisory panels composed of representatives from a variety of public and private organizations. One example is DOE's participation in the Keystone Policy dialogue on Federal facility management, which was established to explore potential areas of consensus and to develop joint recommendations on how priority-setting decisions are made at Federal facilities. Participants include representatives of DOE, Department of Defense, EPA, the Office of Management and Budget, States, Indian Tribes, congressional staff, national environmental organizations, local activist groups, and other interested parties. The group was established in early 1991 and has had many plenary sessions and created several working groups. Such dialogue can help DOE develop new approaches to resolving priority issues related to planning, budgeting, stakeholder and public participation, and information sharing. The dialogue could also provide a basis for a consistent approach to priority setting across Federal agencies. One major idea being discussed is the creation of national and site-specific advisory boards representing a range of stakeholder interests to have substantive input into priority-setting decisions and issues.

As mentioned earlier, DOE has established the Environmental Restoration and Waste Management Advisory Committee as part of the Programmatic Environmental Impact Statement process. This committee will develop options for resolving difficult issues facing the program, including establishing cleanup criteria, land use, priority setting, and strategies for determining the future national configuration of waste management and disposal facilities. DOE is also inviting community organizations to play active roles in developing facility transition plans and identifying potential future site uses.

DOE recognizes that implementation of an aggressive, substantive, program-wide public participation program is key to achieving its mission for environmental restoration and waste management. Efforts during FY 1992 focused increased attention on achieving such a program, with active involvement of a full range of public interests.

1.6.3 FACILITY TRANSITION, ACCEPTANCE, DEACTIVATION, AND DISPOSITION

DOE's rapidly changing mission and priorities require the recycle, transfer, conversion, decontamination, and decommissioning of facilities and sites.

Due to a number of factors – particularly the dramatic changes that have taken place in the former Soviet Union and the related shift in global defense priorities – the United States nuclear weapons complex is currently undergoing a major reconfiguration. As part of this reconfiguration, there will be a sharp increase in the number of facilities being transitioned from a production mode to a cleanup mode.

As a part of the proposed reconfiguration of the nuclear weapons complex (designated Complex 21), one or more DOE sites may be shut down or "downsized" as defense activities are either moved to other sites or terminated. As a result of this effort, some facilities may be identified as surplus to operating needs, requiring shutdown, deactivation of nonessential systems, and final disposition. A recent survey of the nuclear weapons complex identified 1200 facilities (with other estimates as high as 7000 facilities) that may be shut down during the next 30 years. (As used in the FY 1994–1998 Five-Year Plan, "facilities" are those buildings, structures, or groups of either of these that fulfill a specific purpose and are under the responsibility of DOE.) The estimated cleanup cost of these facilities is expected to be in the tens of billions of dollars.

In anticipation of the large number of facilities to be turned over to EM for cleanup, a facility transition planning initiative was established in early 1992. As part of this initiative, the EM Office of Facility Transition and Management was formed to ensure that the proper steps toward transition are planned and taken. Funds to support these activities have been provided by both EM and Defense Programs, which provided the majority of resources. EM has already requested funding for its share of the transition activities in the FY 1993 and 1994 budgets. Funding of transition planning is one of several issues still under negotiation within the Department.

The Transition Process

Individual DOE offices, such as Defense Programs, Energy Research or Nuclear Energy, are responsible for the safe operation, shutdown, and ultimate disposition of facilities used to support their respective operating programs. In the past, however, many surplus facilities were shut down with little or no follow-up actions taken. One of EM's functions is to centralize DOE's management and planning of surplus facility cleanup activities to ensure that the risks to the public and environment from these facilities are eliminated or reduced to acceptable levels. A Memorandum of Agreement was signed by EM and the other DOE offices on September 19, 1989, identifying their respective roles and responsibilities in this area. In accordance with the memorandum, EM is responsible for final facility disposition, which may include decontamination and decommissioning of inactive facilities or refurbishing them for further economic development.

DOE has defined the transition process as "the range of activities associated with the transfer of responsibility for a DOE surplus contaminated facility from the operating Program Secretarial Officer to EM. The transition process involves the development of a transition plan, the deactivation and preliminary characterization of the facility, evaluation of the facility against the turnover requirements, preparation of the initial EM budget requests, and other necessary planning and

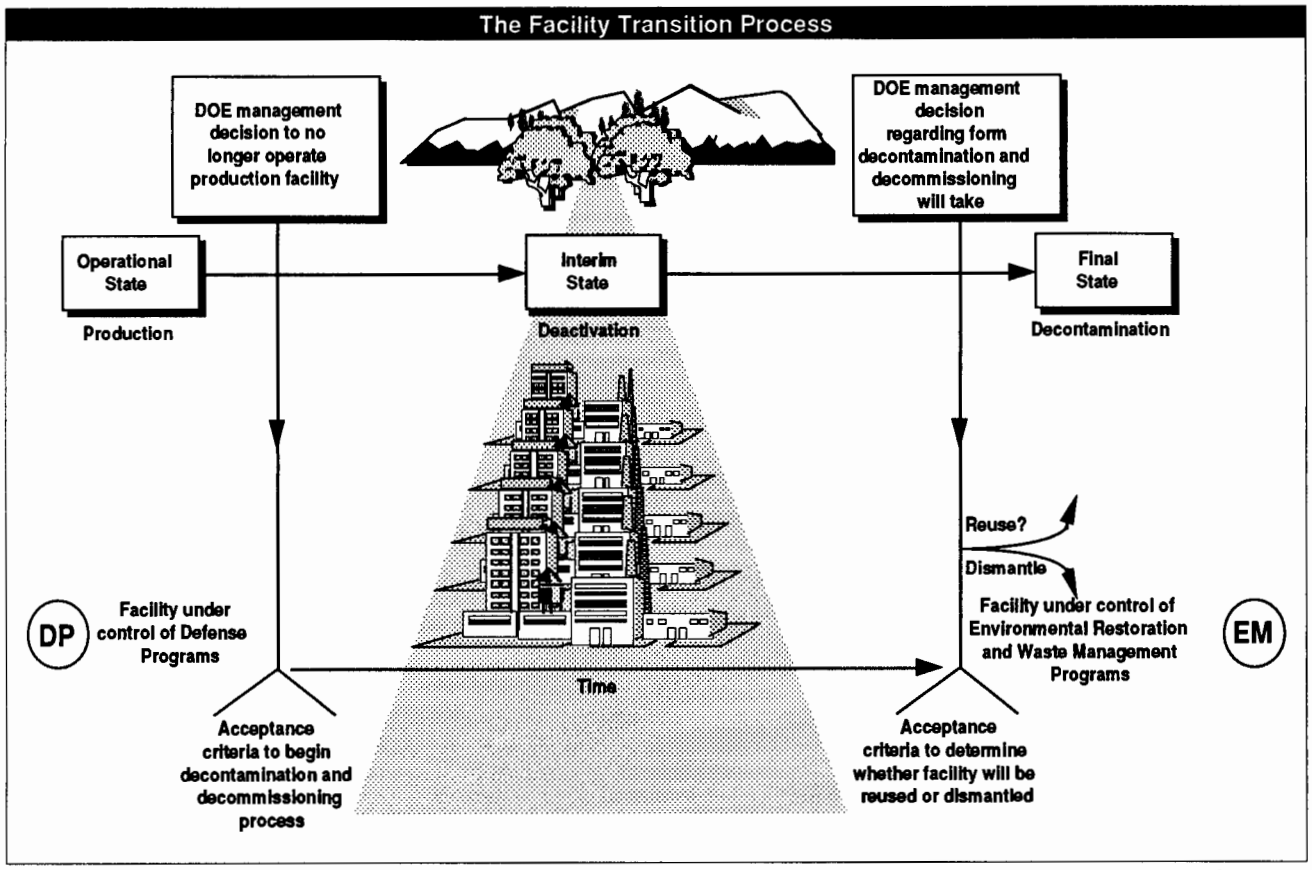


Figure 1.6.3a. In the future, EM expects to receive a large number of surplus facilities from DOE operating programs for final disposition.

information exchange activities. Transition begins when an operating facility is formally declared surplus and ends when responsibility for the facility is formally turned over to EM." (See Figure 1.6.3a.)

A summary of the transition process is included in Section 2.3.1. Transition planning and deactivation activities will in many cases (e.g., Rocky Flats and Idaho Chemical Processing Plant) be a multiyear

Accomplishments

Facility Transition

Since 1979, EM and its predecessor organizations have administered the decontamination and dismantlement of more than 90 contaminated facilities across the complex. Currently, EM has more than 300 inactive facilities that are either undergoing or awaiting decontamination and final disposition.

Recently, EM has been assigned entire sites as part of a change in site mission from weapons production to environmental restoration and waste management.

process, depending on the scope of the work to be done. The dominant time-intensive activities are building characterizations and the deactivation of the facility. Two examples of this are the former Feed Materials Production Center (now the Fernald Environmental Management Project) in Ohio and the Hanford Site in Washington. The Oak Ridge K-25 Site was also recently transferred to EM before completion of required facility shutdown activities. At these sites, facilities that previously supported weapons production missions for Defense Programs are now the responsibility of EM for waste management applications or decontamination and

dismantlement. Because of the relatively short planning period prior to transfer of the facilities, funding to correct facility deficiencies was not identified and included in the EM budget. To perform much-needed corrective activities on the transferred facilities, EM reallocated funds earmarked for other activities.

As a result of recent announcements by the President to cancel several nuclear weapons programs and the subsequent proposal by the Secretary of Energy to accelerate nonnuclear consolidation plans, the Rocky Flats Plant has been selected for near-term shutdown and final disposition. The transition plan for the Rocky Flats Plant was completed in July 1992. This is the first time a comprehensive transition plan has been prepared; therefore, it has been a learning experience for DOE. The Rocky Flats Plant Transition Plan will serve as an indicator of the level of detail needed in any transition plans prepared in the future.

Landlord Responsibilities

EM also has specific landlord responsibilities that are both directly and indirectly related to its waste management and environmental restoration missions. These activities include managing electrical systems, laboratory support, road maintenance and upgrades, fire protection, quality assurance, safety and environmental monitoring, sanitary sewer systems, laundries, utilities, roadways, and security reviews. These landlord functions are not only required to keep pollution control facilities operating, they are also required, in many instances, to meet environmental regulatory requirements. In situations where EM has landlord responsibilities for the entire site, it is not possible to precisely break out those activities that are directly related to waste management and/or environmental restoration.

Figure 1.6.3b illustrates activities and sites transferred to EM over several years. The Waste Management Program currently funds landlord activities at Oak Ridge National Laboratory. Consistent with new secretarial guidance on landlord functions, this responsibility is being transferred back to the Office of Energy Research in FY 1994. The Richland and Idaho landlord functions are also under the purview of the Waste Management Program. Again, specific site landlord activities such as transportation management and infrastructure support are critical to accomplishing EM's waste management functions at these sites. Landlord responsibilities of the Environmental Restoration Program include the Grand Junction Projects Office, the Oak Ridge K-25 Site, and Fernald. In Figure 1.6.3b, funding associated with the takeover of Hanford landlord responsibilities in FY 1994 is not reflected under Transition Management.

Transition Projects and Landlord Responsibilities ($ in millions)

	FY 1991 ($ in millions)	FY 1992 ($ in millions)	FY 1993 ($ in millions)
Facilities Transferred to Waste Management			
Landlord at Idaho, Hanford, and Oak Ridge	9.0	62.8	136.2
Support to Gaseous Diffusion Plants	20.2[a]	57.8	74.9
Plutonium/Uranium Extraction and Uranium Tri-Oxide Plant	72.3[b,c]	54.6	49.9
Plutonium Finishing Plant	70.8[b]	64.1	89.0
T-Plant	0.0	20.5	28.9
K-Area Fuel Storage Basins	0.0	30.6	33.8
300 Area Fuel Fabrication Facility	0.0	1.9	7.8
Fast Flux Test Facility	83.5	79.0	45.0
TOTAL	**255.8**	**371.3**	**465.5**
Facilities Transferred to Environmental Restoration			
Fernald Settlement Payment	20.5	50.9[e]	0.0
Fernald Site Operations and Landlord	264.5[d]	234.9	314.9
Support for Gaseous Diffusion Plants	92.7	81.5	114.1
Landlord at Oak Ridge K-25 Site	4.0	10.0	22.0
Landlord at Grand Junction Projects Office	0.0	0.0	0.0
N-Reactor	41.3[b]	84.2	21.3
Transfer from UE/NE for Gaseous Diffusion Plant Cleanup Based on New MOU	0.0	0.0	0.0
TOTAL	**423.0**	**461.5**	**472.3**
Transition Management[f]			
Transition Plans and Implementation	N/A	N/A	11.6
Building Characterization	N/A	N/A	8.2
TOTAL	N/A	N/A	**19.8**
Program Direction			
Hanford and Idaho Personnel	**3.9**	**41.5**	**39.7**
GRAND TOTAL	**682.7**	**874.3**	**997.3**

[a] Reflects funding for Oak Ridge K-25 Site, including Toxic Substances Control Act Incinerator.
[b] Funds appropriated under Nuclear Materials support budget.
[c] $34,000,000 transferred to Waste Management in the fourth quarter of FY 1991.
[d] $85,900,000 in Defense Programs in FY 1991.
[e] $130,000,000 transferred from Defense Programs; balance comes from within EM.
[f] Assumes that the current operating program budgets for surveillance and maintenance and required transition activities in facilities to be transferred and that appropriate funding will transfer to EM with the facility. Also assumes that changes in transfer of landlord responsibility (DP to EM, NE to EM, etc.) will be negotiated in time to meet budget cycle requirements.

The figures above represent preliminary estimates.

Figure 1.6.3b. The scope of EM work is growing as EM becomes responsible for additional sites and facilities.

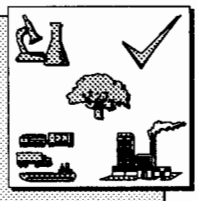
Future Activities

To ensure that future facility transfers are planned and conducted in a more timely and cost-effective manner, the Office of Facility Transition and Management was established within EM. This organization is responsible for addressing the technical, management, and institutional issues associated with facility transition.

The initial focus of EM facility transition planning is on:

- establishing a systematic and approved approach for facility transitions to enable EM to budget and plan for the transfers without inordinately affecting ongoing EM programs.
- developing overall sitewide transition plans that address not only the physical transfer and disposition of the affected facilities but also impacts on the work force and local community.
- conducting early organizational planning to allow sufficient time for budgets and other documentation to be in place.
- identifying, assessing, and characterizing candidate facilities to support planning and budgeting of required transition activities. (EM can only provide budget for a facility being transitioned when given at least two years notice to establish funding authorization before the facility is transferred.)
- establishing a protocol to evaluate the disposition options of surplus facilities against other EM missions and long-term land-use plans for the affected facilities.
- establishing a protocol for identifying and evaluating the applicability of environmental, safety, and health requirements that apply and/or are appropriate for facilities in the transition process.
- developing methods for incorporating participation by affected State, Tribal, and local governments and the public in transition planning, which will continue for facilities identified for transfer to EM. Pending the Nonnuclear Reconfiguration Environmental Assessment, the Mound and Pinellas Plants may also transfer to EM. Preliminary transition planning for the Mound and Pinellas Plants is just beginning, with more detailed planning scheduled in FY 1993 if the environmental assessment supports shutdown of these sites.

1.6.4 ELIMINATION OF UNACCEPTABLE RISK



A primary EM objective is to clean up all surplus facilities and inactive sites and treat, store, and dispose of hazardous, radioactive, and mixed waste so that unacceptable risk to the environment, public, worker health, and safety is neither posed nor remains.

The basic EM mission focuses on ensuring the safety of ongoing waste management operations and cleaning up surplus facilities and inactive waste sites so that risks to the public, the workers, and the environment are within prescribed, acceptable levels. Existing regulations and DOE Orders provide a framework within which to evaluate the risks posed by a specific waste operation or inactive waste site. Risk evaluation methods and event and consequence analyses (used in performance assessments, probabilistic risk analyses, CERCLA risk assessments, safety analyses, and environmental impact assessments) provide DOE with a basis for assessing both risk and any actions that are being considered to reduce that risk.

CERCLA is a particularly useful tool for establishing risk-reduction procedures because the statute is risk-driven and allows flexibility in remedy selection. The establishment of risk-based cleanup goals at many DOE sites involves a CERCLA baseline risk assessment that is subject to public review. The baseline risk assessment estimates the risk to human health and the environment from a waste unit in the absence of remedial action. This important step specifically identifies the potential risks and their magnitudes and allows DOE and the regulators to craft an appropriate cost-effective solution to the problem. If the baseline risk levels exceed the risk range established in EPA's National Contingency Plan, then a range of remedial alternatives will be evaluated as part of the feasibility study. This evaluation of alternatives considers many factors, including cost and short- and long-term effectiveness in reducing risk and achieving cleanup goals. Remedial alternatives can range from removal of waste and contaminated soil or water for treatment and disposal elsewhere to in situ treatment and stabilization to administrative controls to restrict access to a site. If baseline risk levels are high enough, interim actions are warranted to reduce the short-term risk to within acceptable levels pending development of the final cleanup remedy. Risk assessments are also a valuable tool to aid in balancing risk when considering removing waste from one location and disposing of it at another.

DOE, in collaboration with Tribes and Federal, State, and local regulatory agencies, is attempting to develop and implement clear cleanup and land-use objectives to achieve cost-effective protection of the environment and public health and safety. In particular, the ultimate use of a site is a major determinant of acceptable risk (Figure 1.6.4). As stated in the FY 1993–1997 Five-Year Plan, not all sites and facilities will be available for unrestricted use. Past waste management practices have left DOE with many sites that cannot be remediated to pristine levels (i.e., the activities of the last 50 years cannot be totally reversed) with current remediation technologies.

The former Advisory Committee on Nuclear Facility Safety to the Secretary of Energy (Ahearne Committee) supported Admiral Watkins' position that land-use planning be used to determine and expedite long-term cleanup of contaminated sites while minimizing risk to the environment and the public. As discussed in Sections 1.3 and 1.6.1, land-use planning is aimed at reaching consensus-based decisions on sites to be released for unrestricted use, to be partially restricted, or to be restricted to the management of hazardous waste and materials. If the land will eventually be released for unrestricted use, the standards will be more stringent than if the land is designated for a waste disposal facility. In effect, land-use planning can help

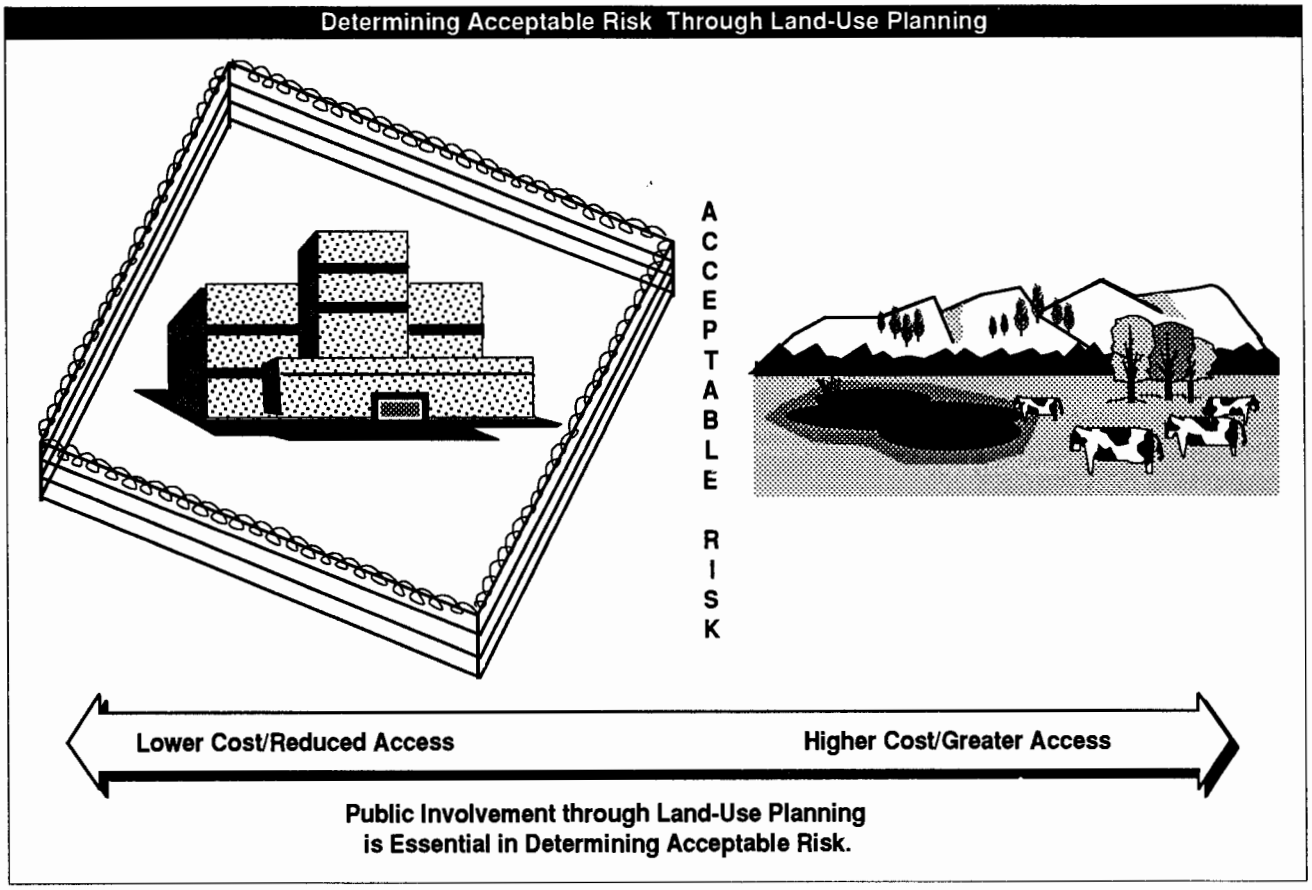


Figure 1.6.4. The cost of remediation depends on ultimate land use and removal of unacceptable risk.

answer the question "How clean is clean?" by posing the question "Clean for what use?" According to the Ahearne Committee report, a policy based on land-use planning would lead naturally to the appropriate selection of new cleanup criteria based on an initial assessment of environmental risk for the proposed land use rather than on the assessment of an ill-defined future public health risk with its attendant uncertainties.

In addition to the CERCLA provisions for risk assessments of inactive sites, DOE Orders outline requirements for performance assessments and safety analyses to evaluate the safety of facility operations. DOE Order 5820.2A, Radioactive Waste Management, addresses requirements for the management of radioactive waste at DOE facilities and, in particular, establishes the requirements for radiological performance assessments for low-level waste disposal sites. Performance assessments evaluate potential radiological dose to the general public from disposal operations and after disposal site closure and must demonstrate compliance with dose limits established in the Order.

DOE Orders also require contractors responsible for the design, construction, and operation of DOE nuclear facilities (including most waste storage and treatment facilities) to perform a safety analysis that develops and establishes the bounds of safe operations of the facility. The safety analysis is a documented process that identifies hazards within a given DOE operation; describes and analyzes the adequacy of measures taken to eliminate, control, or mitigate identified hazards; and analyzes and evaluates potential accidents and their associated risks. The DOE Orders also specify independent review and approval requirements for safety analyses before facilities may begin operation.

Accomplishments

DOE is continuing to reduce risk in all operations

DOE is aggressively pursuing actions to reduce near-term risk at all its sites. For example, DOE is moving forward with plans to minimize risk to the drinking water supplies for communities in the vicinity of Rocky Flats. Through the Secretary's Safe Drinking Water Initiative and the Surface Water Management Plan, plans have been developed for a flood control diversion canal and retention basins around and upgradient of Standley Lake, a reservoir near the community of Westminster. These engineered structures will minimize the risk to downstream users of Standley Lake from unanticipated runoff from the plant caused by heavy rainfall. Runoff would be routed to the canal, trapped in a series of retention basins, sampled for any potential contamination, and released (bypassing the reservoir) or treated as appropriate.

The Fernald Environmental Management Project has identified 26 "removal actions" as interim remedial activities prior to final remediation of the site. Several of the removal actions, such as the treatment of contaminated perched groundwater beneath the former production buildings, have been implemented to eliminate immediate health threats to the public and the environment. The South Groundwater Contamination Plume Removal Action consists of five parts including the collection and treatment of uranium-contaminated groundwater, installation of a new potable water well, and connection of both industries and residents to new potable water supplies. Two removal actions involve the collection of contaminated surface water runoff from the former production and waste disposal areas for treatment prior to surface water discharge, and safe shutdown procedures are being implemented in the former processing buildings to remove the potential threat of uncontrolled releases to the environment.

Expedited response actions are continuing

Expedited response actions also have been initiated at a number of DOE sites to control environmental contamination and eliminate any immediate health threats to the public. The Savannah River Site, for example, has implemented an aggressive program to capture and treat groundwater contaminated with the organic solvents trichloroethylene and tetrachloroethylene. To mitigate groundwater contamination, the groundwater pump-and-treat program was implemented in 1985 under RCRA regulatory guidelines. The groundwater recovery well system has recovered nearly 1.3 billion gallons of water with the air-stripping operation responsible for removing approximately 228,000 pounds of solvent since inception of the project.

Concentrations of solvents captured by the system have decreased from roughly 47,000 parts per billion at startup to approximately 12,000 parts per billion at the end of 1991. The current cleanup goal for the groundwater remediation project is the attainment of water quality that will meet drinking water standards, currently at five parts per billion for trichloroethylene and tetrachloroethylene. Current state-of-the-art pump-and-treat technologies are not able to achieve the five parts per billion level. While no risk-based cleanup standards have been developed for this project, it is apparent with the current state of technology that both technological development and risk-based cleanup standards are needed. DOE has begun a large research and development campaign (discussed further in Section 2.4) to address such technical barriers.

Environmental restoration activities at the Rocky Flats Plant include two expedited response actions that are continuing to eliminate immediate health threats to the public. At the Operable Unit 1 (881 Hillside) Interim Remedial Action, a french drain system is collecting contaminated alluvial groundwater within the 881 Hillside Area. The water is pumped to a treatment facility that will use ultraviolet-peroxide oxidation to destroy organic contaminants and an ion exchange process to remove metals. At the Operable Unit 2 (903 Pad, Mound and East Trenches) Interim Remedial Action, contaminated surface water in the immediate area is controlled and treated to remove organic contaminants, metals, and radionuclides.

DOE is expanding safety reviews of all operations

As part of an overall effort to improve safety and reduce risks to workers, the public, and the environment, guidance was issued to DOE Field Offices in early FY 1992 on safety analyses for EM activities. This guidance requires all field activities, including remediation activities, to undergo the stringent safety review process required of nuclear facilities unless specifically exempted by DOE Headquarters.

At the Idaho National Engineering Laboratory, for example, resumption of low-level and mixed waste treatment operations at the Waste Experimental Reduction Facility is on hold pending a complete revision of the facility safety documentation. This review and revision is in keeping with DOE guidance to ensure safety to the public, the workers, and the environment.

Issues and Strategies

Lack of agreement on the definition of acceptable risk and "how clean is clean?"

Even though CERCLA and related EPA guidance provides a framework for assessing risk at inactive waste sites, questions remain regarding appropriate cleanup standards and de minimis limits for contaminants, particularly radionuclide contaminants. These issues affect planning for treatment, storage, and disposal of radioactive and hazardous waste as well as compliance agreements and technology development activities. In instances when limits have not been established for a particular contaminant that can be adopted as the cleanup standard, the de facto standard is frequently zero. Unfortunately, not only is "no remaining contamination" technically impossible to achieve in most cases, but both the cost and the volume of contaminated material requiring treatment and disposal can be immense. The establishment of general standards would therefore be desirable to support site-by-site determinations of appropriate cleanup programs.

DOE entered into a Memorandum of Understanding with EPA to assist in developing criteria and guidance for the cleanup of transuranic waste and other radionuclides at Federal facilities. DOE will also monitor regulatory initiatives being pursued by other agencies that may affect resolution of these issues, including the Nuclear Regulatory Commission's recent decision to proceed with participatory rulemaking to develop residual radiological criteria for decommissioning facilities and sites.

With the exception of the risk ranges provided in the EPA National Contingency Plan, there are no national standards for acceptable risk levels for cleanup. DOE and other Federal agencies are considering establishing an external review body to oversee the development of acceptable risk definitions and standards and to establish a coordinated executive, legislative, and regulatory approach at the Federal, State, and local level to implement the standards. DOE is currently working on two strategies to assess and minimize risk: the EM Programmatic Environmental Impact Statement (PEIS) and the incorporation of land-use planning into its processes. The EM PEIS will assess the potential risk to health, the public, the environment and workers as a key element of alternative analysis. The overall potential risk of each environmental restoration and waste management alternative will be addressed. The difference in potential risk between each alternative will be calculated to determine which alternative results in the lowest possible risks to the public. Risks will be balanced with the cost of achieving lower risk alternatives. The EM PEIS will be reviewed by the EM Advisory Committee, the National Academy of Sciences, and the public. The EM PEIS will help determine the DOE approach to accomplishing its mission in the future.

Land-use planning will also be used as a DOE strategy to reduce risk, control cost and build consensus. Following Admiral Watkins' and the Ahearne Committee's leadership, EM will use land-use planning strategies to help frame the

question "How clean is clean?" and define the final use for the land before cleanup begins. This strategy will answer the question "How clean for what use?" Knowing the ultimate use of land being restored will assist in determining what level of risk would be acceptable.

DOE is taking a more proactive role in reviewing and recommending alternatives to help shape Federal regulations to enhance the benefits to public health and the environment and to reduce the complexity and difficulty in applying these regulations. Planning will be conducted in a manner that anticipates and helps develop future risk-based requirements. Only through regulatory and public dialogue can this issue effectively be addressed.

The public has no clear method to evaluate "relative risks"

An element of risk is present in most activities; human error, unexpected mechanical failure, natural forces, such as weather, and other factors inevitably contribute to risk. DOE recognizes that determining acceptable risk levels involves personal values, not just scientific calculations. DOE's goal is to create a forum whereby safety standards, land-use decisions, and discussions of risk can be made with participation by all affected parties. Development of risk communication programs is clearly essential to developing greater awareness about DOE cleanup activities. Risk tutorials for media representatives, other coordinated and science-based risk communication programs, including teacher education and secondary school outreach activities, and the public are one component of an effective risk communication strategy.

With no agreement on acceptable risk levels, stakeholders assert the need for disposal sites and standards but are reluctant to accept disposal or storage facilities in their respective geographic areas. DOE is therefore faced with increasing volumes of waste that require treatment, storage, and disposal, but insufficient capacity to treat or dispose of it. DOE hopes that by combining a land-use planning approach, better risk analyses and risk communication, and improved public participation in its decision-making processes, siting and operating essential facilities will become less contentious.

1.6.5 COMMITMENT TO REGULATORY COMPLIANCE

EM will bring all facilities and sites that it manages into compliance with applicable laws, regulations, and agreements aimed at protecting public health, worker safety, and the environment.

DOE policy requires management of its facilities in compliance with applicable Federal, State, and local regulations. As illustrated in Figure 1.6.5, establishing and maintaining compliance are currently the principal drivers for the DOE Environmental Restoration and Waste Management Programs and are the combined responsibility of line management at Field Offices and Headquarters. EM is making significant progress in achieving full compliance with applicable environmental laws and regulations. For example, among compliance-driven waste management activities undertaken in 1991 was the start of full operations of the Toxic Substances Control Act Incinerator at Oak Ridge, which is the only currently operating mixed waste incinerator in the DOE complex. More than 331,000 pounds of liquid mixed waste was incinerated in FY 1991, and the goal for FY 1992 was 2.5 million pounds. A total of 1.7 million pounds have been incinerated since the start of operations in April 1991.

The Environmental Restoration Program made headway in RCRA- and CERCLA-driven assessment, characterization, and cleanup. While much of the activity is still in the assessment and characterization phase, some significant remediation has been accomplished. For example, in FY 1991, surface remediation of Uranium Mill Tailings Sites at Durango, Colorado, and Lowman, Idaho, was completed at a cost of $9.2 million. Actions at the Rocky Flats Plant related to removal and solidification of pond sludge contaminated with mixed waste have continued at a cost of $16.5 million. At Hanford, two expedited response actions were completed and a third was initiated. One hundred twenty drums of waste and 7000 cubic yards of contaminated soil were excavated from unlined trenches, and a carbon tetrachloride soil vapor extraction system was successfully tested. Crystallized solid material was completely removed from Hanford solar basins at a cost of $9 million, and three major sites at the Savannah River Site were closed at a cost of $10.5 million. The highlights of the FY 1992 program included robotic mapping and bentonite capping of the Fernald K-65 silos at a cost of $5 million (and at a savings of $15 million due to the technology employed); beginning full-scale carbon tetrachloride vapor extraction at Hanford; and beginning operation of the Quarry Water Treatment Plant at the Weldon Spring Site at a cost of $4 million.

There have been a number of setbacks, however. Most notable are delays encountered in the initiation of a multi-year Test Phase using radioactive waste at the Waste Isolation Pilot Plant (WIPP). WIPP was constructed as a research and development facility to demonstrate safe geologic disposal of defense transuranic waste currently stored at ten sites in seven States. In October 1991, the Secretary announced WIPP readiness to begin a test phase with transuranic waste to determine WIPP compliance with environmental requirements for the disposal of transuranic and mixed waste. The Secretary's announcement of WIPP's readiness for the Test Phase was a result of completion of all technical prerequisites, including the operational readiness review and safety and environmental documentation, as well as the successful completion of extensive, independent reviews by the State of New Mexico, the Environmental Evaluation Group, the Blue Ribbon Panel, the National Academy of Sciences, the Defense Nuclear Facilities Safety Board, and the Advisory Committee on Nuclear

Facilities Safety. In addition, a full transportation system for use during the Test Phase was in place, including shipping containers certified by the Nuclear Regulatory Commission. DOE, in cooperation with affected States, had conducted extensive training along shipping corridors and had successfully completed emergency response exercises.

However, DOE plans to begin the Test Phase at WIPP were indefinitely delayed by litigation that focused on two major issues: (1) WIPP compliance with RCRA permitting requirements and (2) the validity of an administrative order issued by the Department of Interior to withdraw from public access Federal lands in the vicinity of WIPP and allow the limited emplacement of transuranic waste during the Test Phase.

The U.S. Court of Appeals for the District of Columbia Circuit issued a ruling on July 10, 1992, that confirmed WIPP eligibility for "interim status" under RCRA permitting requirements although the Court did not determine that DOE had, in fact, obtained "interim status." The Court also concluded, however, that the Department of Interior did not have authority to modify and extend the existing administrative land withdrawal order and thus upheld the lower court's injunction. Only a legislative land withdrawal could allow shipments of waste to WIPP.

On October 30, 1992, the WIPP Land Withdrawal Act (PL 102-579) was enacted. In addition to withdrawing public lands surrounding the WIPP site, the law established a new regulatory framework for WIPP involving regulatory oversight by EPA and other Federal agencies. Implementation of the WIPP Land Withdrawal Act is a top priority for DOE. Assuming all the law's prerequisites are met, the earliest DOE can begin the first Test Phase shipment is August 1993.

A number of regulatory and compliance issues have been identified as the appropriate focus for continued cooperative review by Federal, State, Tribal and local representatives. These issues, and the regulatory framework for them, are discussed below.

The Regulatory Framework

Federal Regulations

Major Federal environmental legislation driving the EM Program includes the Resource Conservation and Recovery Act (RCRA); the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); the National Environmental Policy Act (NEPA); and the Federal Facility Compliance Act (FFCA). RCRA addresses the cradle-to-grave management of hazardous wastes, including treatment, storage, and disposal. The provisions of this Act include identification and listing of hazardous wastes, standards for generators and transporters of hazardous wastes, standards for owners and operators of hazardous waste facilities, restrictions on land disposal of hazardous wastes, requirements for hazardous waste permits, and technical standards for the operation of underground storage tanks. RCRA regulations also apply to the hazardous portion of radioactive mixed waste.

CERCLA, also known as "Superfund" and amended by the Superfund Amendments and Reauthorization Act of 1986, requires the identification, reporting, and remediation of releases of hazardous substances and pollutants and contaminants into the environment. The National Contingency Plan in the *Code of Federal Regulations* (40 CFR Part 300) provides for the identification and listing of contaminated sites, investigation, development of alternatives for remediation, implementation of remedial actions, and public participation.

NEPA requires Federal agencies to consider the potential environmental impacts of proposed major Federal actions affecting the quality of the human environment. The NEPA process is intended to identify and assess reasonable alternatives to proposed actions that will avoid or minimize adverse effects on the quality of the human environment. NEPA ensures that environmental information is available to public officials and citizens before decisions are made and before actions are taken by Federal agencies.

The Federal Facility Compliance Act of 1992 (PL 102-386) was signed into law by the President on October 5, 1992. The objective of the FFCA is to bring all Federal facilities into compliance with applicable Federal and State hazardous waste laws, to waive Federal sovereign immunity under those laws, and allow the imposition of fines and penalties. The FFCA also includes provisions concerning DOE compliance with RCRA land disposal restrictions (LDRs) for mixed waste (waste that has both hazardous and radioactive components). Immunity is waived for facilities subject to LDR administrative or judicial order, agreement, or permit as of October 6, 1992. Facilities are not subject to fines or penalties as long as they remain in compliance with the order or agreement. For facilities not subject to an LDR order or agreement, fines and penalties for LDR violations are delayed for three years as long as mixed waste is managed in compliance with all other requirements. For DOE sites that generate or store mixed waste, the FFCA requires the development of new site-specific compliance plans within the three-year timeframe and also requires DOE to develop a new, detailed mixed waste inventory report within 180 days. After three years (by October 1995) facilities must be in compliance with an approved plan and an order requiring compliance with the site-specific plan must be issued. DOE's compliance challenges will focus on the short time the FFCA allows for developing site-specific plans for treating mixed waste and obtaining approvals of appropriate State regulators and the EPA.

Other more specific acts dealing with environmental issues include the Clean Air Act, Federal Water Pollution Control Act (Clean Water Act), Safe Drinking Water Act, Toxic Substances Control Act, and, of particular relevance to DOE activities, the

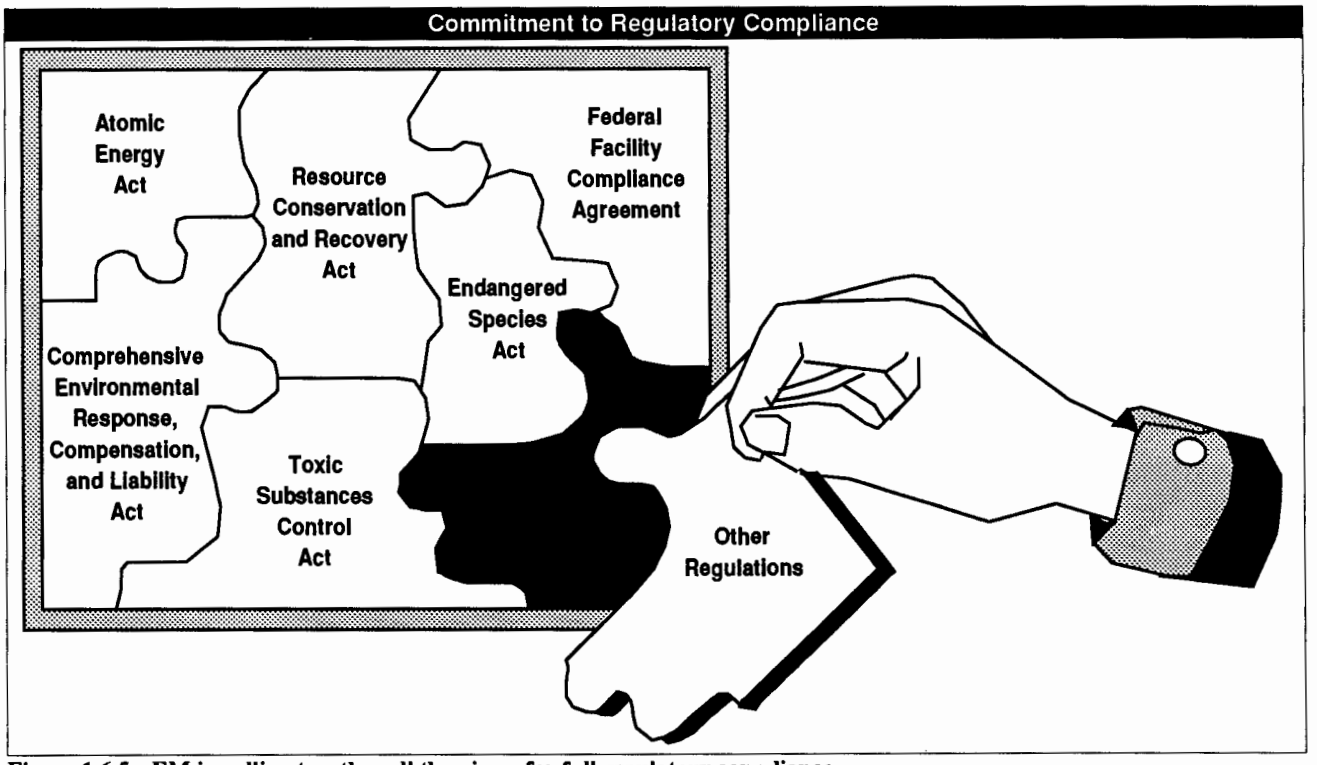


Figure 1.6.5. EM is pulling together all the pieces for full regulatory compliance.

Atomic Energy Act as amended, the Uranium Mill Tailings Radiation Control Act, the Low-Level Waste Policy Act as amended, and the Nuclear Waste Policy Act as amended. Additional regulations have been imposed on transportation of hazardous or radioactive materials and related to occupational safety and health. Through its provisions on applicable or relevant and appropriate requirements, CERCLA requires a review of the full spectrum of environmental regulations in setting cleanup goals.

With respect to mixed waste (waste that contains both a radioactive and otherwise hazardous component), storage, treatment and handling requirements have been established in accordance with the provisions of two key statutes: the Atomic Energy Act of 1954 as amended, which applies to the radioactive component of mixed waste, and RCRA, which establishes requirements applicable to the hazardous component of the waste.

State and Local Regulations

With the environmental management responsibility of more than 100 sites in 36 States and territories, EM is also subject to an increasing number of State and local regulations. In many cases, these regulations differ from one jurisdiction to another. As EPA continues to delegate Federal hazardous waste regulatory authority to the States, the complexity of the hazardous waste regulatory framework has increased. A major EM goal over the next several years will be to identify, in conjuction with Federal, State and local representatives, various strategies to achieve regulatory consistency.

Agreements

Site-specific cleanup and compliance agreements are a primary means for DOE to implement the provisions of Federal, State, and local regulations. As previously noted, DOE has developed 87 compliance and cleanup agreements with EPA and States hosting DOE facilities and is making progress in negotiating an additional 27 agreements. These agreements have proven to be effective in reducing conflicts among regulatory agencies and in helping DOE achieve cost-effective compliance with the provisions of the environmental regulations. In addition, as of April 1, 1992, approximately 20 compliance or cleanup agreements have been closed out because their provisions were fulfilled. Compliance Agreements are listed in Appendix F, as are Consent Decrees and Agreements-in-Principle.

In developing such agreements, DOE has attempted to balance the understandable interest of regulators to establish stringent deadlines with the recognition, in some cases, of a high number of technical uncertainties that may be controlling factors in the implementation of remediation programs. However, the Department has not been entirely successful in balancing these considerations in all agreements nor been completely successful in predicting its ability to conduct work in accordance with the schedules specified in agreements.

EM is taking several important steps to avoid these difficulties in the future. First, EM has initiated a comprehensive "resource assessment" of all compliance and cleanup agreement requirements in order to assess each site's practical ability to meet agreement milestones. This assessment includes a review of the following factors:

- all technical activities to be conducted under the agreement;
- staffing levels required to conduct technical activities;
- existing staff levels at the facility and, where new staff are required, the time required to hire new staff and provide adequate environmental training;
- schedules and costs of any required construction;
- requirements and costs related to the acquisition and maintenance of capital equipment;
- operating overhead expenses;
- requirements for procurement and contracting actions; and
- availability of laboratories to analyze samples.

Results of the assessment will indicate those milestones in agreements that are not practically achievable and those activities and milestones that require review with EPA and State regulators for potential extension and/or modification.

The first such comprehensive assessment was successfully completed in 1991 at the Fernald Environmental Management Project. As a result, an agreement was renegotiated with EPA to reflect new appreciation of the complexities of the environmental cleanup. To ensure that the emerging agreement was both realistic and functional, close cooperation was maintained among DOE Headquarters, DOE Field Offices, and contractors, as well as open and frank discussions with the regulators. The process and results of the Fernald negotiation should serve as a model for future negotiations.

Management of Mixed Waste

RCRA Land Disposal Restrictions

In its effort to manage mixed waste under RCRA, DOE has identified a major compliance issue. Section 3004 of RCRA prohibits the land disposal of certain hazardous and mixed wastes unless the wastes have been treated in accordance with EPA standards in order to reduce their potential for migration. The section also prohibits the storage of these wastes except to allow the accumulation of sufficient quantities to facilitate proper recovery, treatment, or disposal. In many situations involving mixed waste, full compliance with this provision is impossible because treatment technology and sufficient treatment capacity currently do not exist for much of the mixed waste produced by DOE and other generators in the United States. Over the past year, DOE has joined with Congress in an effort to develop options for addressing this problem in proposed amendments to RCRA. The Administration also has proposed specific amendments to RCRA that would require DOE to develop an enforceable national compliance plan under which treatment technology and facilities would be established and EPA to develop standards for treating the waste that specifically address issues and hazards related to the radioactive component of the waste.

In anticipation of the expiration of the land disposal restriction (National Capacity Variance) on May 8, 1992, DOE submitted to EPA a one-year case-by-case petition to extend the effective date of the land disposal restrictions on "thirds" mixed waste (see Glossary) to May 1993. On May 7, 1992, EPA signed a notice of intent to grant the extension application for all the demonstrations required except one; DOE is continuing to work closely with EPA.

In addition to applying for the case-by-case extension, DOE has taken a number of significant actions to enhance its management and disposal of its mixed waste. DOE has initiated an aggressive research and development program devoted to waste management and cleanup. A significant portion of the funding for this program will be used to support the investigation and development of treatment technologies for mixed waste. Moreover, DOE has brought five mixed-waste treatment facilities on-line since 1987, including the Toxic Substances Control Act Incinerator at Oak Ridge, the Waste Experiment Reduction Facility at Idaho, the Z-Area Saltstone Facility at Savannah River, the Cement Solidification Facility at West Valley and the Unit 42 Liquid Process Waste Treatment Facility at Rocky Flats. An additional 21 treatment facilities are expected to be operational by 1997.

Compliance agreements between DOE and EPA have been developed for four facilities (Savannah River, Rocky Flats, Oak Ridge and Hanford) where technology research and/or development is well under way for the treatment of specific waste streams. At the Rocky Flats Plant, for example, land disposal restricted wastes are governed by a Federal

Facility Compliance Agreement signed by EPA and DOE on May 10, 1991. This agreement, among other things, requires DOE to prepare and submit a Comprehensive Treatment and Management Plan that will provide EPA with enforceable milestones for the development and implementation of treatment and management technologies for certain land disposal restricted wastes at the Rocky Flats Plant.

DOE is assisting EPA in that agency's effort to set the mixed waste treatment standards. Based on information supplied by DOE, EPA established specific treatment standards for four types of mixed waste in 1990. DOE continues to work with other generators of mixed waste to provide additional data on mixed waste treatment. DOE also supports EPA's determination of the need for additional alternative treatment standards that would ensure that radiological hazards are not created by the treatment of the hazardous component of mixed waste. As part of this support, DOE assisted in the development of the provisions of the Federal Facilities Compliance Act of 1991 (S.596) which, if enacted into law, would help meet this need.

National Compliance Plan Strategy

As previously noted, one of the most significant regulatory challenges facing DOE relates to the generation and treatment of mixed waste and remediation of sites with radioactive and hazardous contaminants. The Federal Facility Compliance Act, enacted in October 1992, requires DOE to submit site-specific mixed waste treatment plans to EPA or the appropriate State regulatory agency. DOE believes that a two-step process—development of a National Compliance Plan followed by development of site-specific plans—is the most prudent and, with the support of EPA and the States, viable approach to meeting the requirements of the Federal Facility Compliance Act. In an effort to define the content and establish a production process for a national plan, DOE developed and issued a draft strategy in late FY 1991 for review by EPA and the Western Governors' Association. In December 1992, DOE published and solicited comments on a proposed draft Strategy for Development of a National Compliance Plan for DOE mixed waste. The draft was published in the Federal Register on December 3, 1992 (57 FR 57170).

As outlined in the December 1992 draft strategy, the primary objective of the National Compliance Plan will be to integrate the Department's mixed waste management activities into a coordinated national plan to ensure development of adequate mixed waste treatment capacity and to establish proposed schedules for: (1) using and upgrading existing mixed waste treatment capacity; (2) developing new mixed waste treatment facilities; (3) submitting necessary permit applications for treatment facilities; and (4) construction and using new treatment facilities. The proposed schedules and activities developed in the national planning process will be incorporated into site-specific mixed waste plans for individual DOE facilities. To support this effort, DOE has proposed the active involvement of EPA, States, and interested parties in the development and review of the National Compliance Plan. DOE also intends the National Compliance Plan to be integrated with, and to build upon, various planning and public participation efforts in progress in all programs. In particular, development will be carefully coordinated with the EM Programmatic Environmental Impact Statement.

RCRA "Mixture/Derived-from Rule"

DOE has had to manage some wastes that contain very low concentrations of listed hazardous wastes because they are subject to the RCRA "mixture/ derived-from rule." However, this rule was recently remanded on the grounds of insufficient opportunity for public comment during its development. Currently EPA is considering an approach by which wastes containing hazardous constituents below an agreed-upon health-based concentration threshold are not subject to RCRA hazardous waste regulation. Some DOE-owned mixed waste could fall into this category, reducing the volume of hazardous waste needing to be managed under RCRA.

RCRA Workshop Findings

Many of the compliance issues facing DOE relate to the treatment, storage, and disposal of mixed waste. At the request of the State and Tribal Government Working Group, DOE recently held a RCRA workshop for Federal and State regulators to discuss the regulation of DOE-generated waste.

The workshop focused on the challenges in meeting RCRA inspection, labelling, waste characterization and tank closure requirements for mixed wastes, especially as they relate to worker exposure and technology needs. In each of these cases, solutions were identified through flexibility, creativity and an open dialogue on the special issues associated with mixed wastes. There was also recognition that current RCRA regulations do not address the special challenges posed by mixed wastes, and several participants called for EPA to adopt special rules for mixed wastes. Transfer of lessons learned throughout DOE and the regulatory agencies can help resolve mixed waste compliance issues.

Other Issues

Individual sites are making good faith efforts to meet compliance goals. However, in many cases compliance schedules are driven by the ability to build and operate new treatment, storage and disposal facilities.

EM senior managers, as part of their effort to develop the Strategic Plan for Environmental Restoration and Waste Management, identified several key compliance issues:

- Present regulations are not always based on data related to human health and environmental risks.
- Regulatory requirements are outpacing compliance capabilities. As a result, technologies and methods may not be available to meet regulatory requirements. Possible funding limitations may limit full compliance with environmental laws and regulations in the time anticipated.
- Differing perceptions of what constitutes acceptable risk may complicate the compliance process.

The EM Strategic Plan describes several major strategies for addressing compliance issues:

- conduct program planning in a manner that anticipates and helps shape future regulatory requirements;
- develop mechanisms for DOE participation in restructuring environmental laws and regulations to consider trade-offs among costs, human health, and environmental risks;
- support development of national priorities and standards based on risk; and
- publish a compliance "report card" that effectively informs the media and the general public about DOE's compliance activities and progress.

Decision Making Under RCRA and CERCLA

DOE must negotiate with its regulators the integration of CERCLA, RCRA, and other applicable laws at a number of DOE installations. The sequential decision-making process required by CERCLA and RCRA inhibits the ability to clearly plan and define milestones and budgets through the life of remediation projects. The CERCLA process is one in which cleanup decisions are made based on information gathered in the early phases of the process and after extensive review by regulators and the public. Thus, it is difficult to project the cost of remedial solutions, many of which will require significant capital and operating outlay. The Federal budget process, however, requires funding requests to be made several years in advance of the actual need date. The inability to base budget requests and

schedules on firm data results in budget and schedule uncertainties. DOE is considering this issue as part of its evaluation of the need for a contingency fund, discussed in Section 1.3. Several installations are working closely with DOE Headquarters to review currently available information relating to contaminated sites as a basis for estimating anticipated funding needs and to evaluate the degree of uncertainty in these estimates based on the CERCLA process. In addition, a Federal Facilities Working Group is discussing modifications to the budget development process to address these concerns.

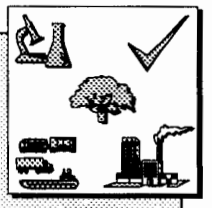
Tracking Compliance Efforts

As discussed in Section 1.4, EM has created the Progress Tracking System to track progress at DOE sites. One element of the Progress Tracking System is to monitor progress toward compliance based on milestones contained in compliance agreements. Each site must report the status of milestones, which allows managers to take appropriate actions where indicators show that compliance may be in jeopardy. The Activity Data Sheets on which the FY 1994–1998 Five-Year Plan are based contain specific information related to milestones that are driven by legal requirements. Major milestones for each facility and their regulatory drivers are listed in Volume II, Installation Summaries.

Progress in Self-Assessment

As discussed in Section 1.6.8, DOE is implementing a self-assessment program for evaluating Headquarters, Field Office, and contractor performance to ensure that noncompliance with Federal, State, and local laws; compliance agreements; and DOE Orders can be identified and corrected. Internal audits, assessments, and appraisals of environmental restoration and waste management programs and projects are also being conducted to determine compliance with environment, safety, and health requirements. Self-assessment provides for continual and critical examination by line management of its own effectiveness. This self-assessment includes evaluation of strengths and weaknesses, determination of root causes of weaknesses, and design and implementation of corrective actions.

1.6.6 PREVENTING POLLUTION AT ITS SOURCE



Building pollution prevention, including waste minimization, recycling, and reuse of materials, into all DOE activities will significantly reduce future wastes and disposal costs.

Pollution prevention, including a full range of processes, practices, technologies, and product designs that serve to eliminate the generation and release of pollutants and wastes, begins with waste avoidance. The rest of the pollution prevention formula is to use methods and technologies that minimize the quantity and toxicity of the wastes that cannot be avoided. A comprehensive approach to pollution prevention can yield significant benefits (Figure 1.6.6). These include conservation of scarce resources, improved environmental quality, improved regulatory compliance, reduced human-health risks, minimization of additional environmental restoration requirements, improved industrial production efficiencies, and prolonged useful life of current and proposed disposal capacity.

Waste minimization is the principal focus of DOE pollution prevention activities and is an important factor in the evaluation of removal and remediation technologies. Waste minimization, a step toward pollution prevention, is any action that economically avoids or reduces the generation of waste by source reduction, improving energy efficiency, or recycling. Some examples are alteration of production methods, recycling of materials within a

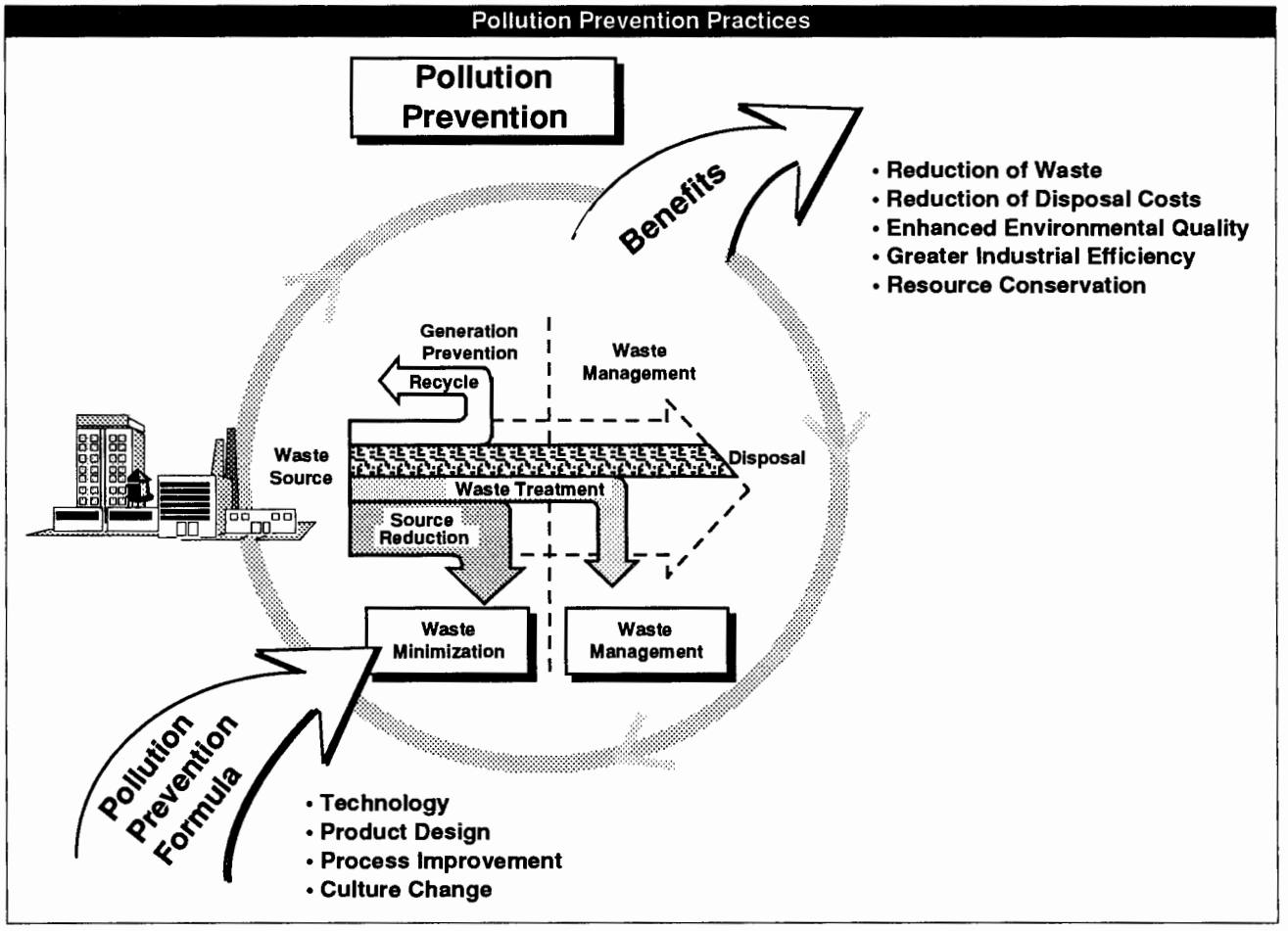


Figure 1.6.6. Pollution prevention practices reduce wastes, conserve resources, enhance industrial efficiency, and reduce costs.

production stream, and materials substitution. The EM program is taking part in the DOE-wide initiative to develop, promote, and implement cost-efficient pollution prevention technologies, practices, and policies. EM is leading and coordinating the planning and policy development effort for its own, and for DOE-wide, waste minimization activities. Waste generation programs fund and implement waste minimization activities. EM is also carrying out several integrated technology demonstrations designed to solve waste generation problems at DOE and industrial production sites. EM works closely in this area with other DOE programs, particularly Defense Programs, the Office of Conservation and Renewable Energy, and the Office of Environment, Safety, and Health.

Accomplishments

An Integrated DOE-Wide Program

Until recently, waste minimization efforts in DOE were largely ad hoc because of a lack of programmatic and DOE coordination, emphasis, and priority. Challenges, such as decontamination and decommissioning of a rapidly growing number of facilities and dismantlement of thousands of surplus nuclear weapons, cannot be met by continuing with "business as usual." Consequently, the Secretary of Energy has requested implementation of a consolidated, integrated DOE-wide waste minimization program as a key element of DOE's overall pollution prevention efforts.

EM has been given DOE-wide leadership and coordination responsibility for this important program. In this capacity, EM guided the recent DOE-wide cooperative effort to create the first Waste Minimization Crosscut Plan. Signed by the Secretary on May 13, 1992, this plan provides the framework for effective coordination of all DOE waste minimization activities and sets forth objectives and strategies to guide those activities. That framework includes an annual report to the Secretary by each DOE program on the progress in waste minimization.

A new structure for leading and managing waste minimization and pollution prevention efforts has been established to implement the plan. It includes a DOE Waste Minimization and Pollution Prevention Executive Board (reporting directly to the Secretary and chaired by the Assistant Secretary for Environmental Restoration and Waste Management) to guide the DOE-wide effort and a revitalized Waste Reduction Steering Committee (reporting to the Executive Board and chaired by the EM Director of Waste Minimization) to coordinate activities across DOE. This structure provides a strong institutional mechanism, provides for uniform program directions, and promotes information sharing, organizational cooperation, and cost-efficient resource allocation. This DOE-wide program structure is mandated by Secretary of Energy Notice 37-92 which established the DOE Waste Minimization and Pollution Prevention Board. The Board was chartered by the Secretary in June 1992 and meets quarterly to review DOE-wide progress.

Technology Development

New technologies and technology applications will be critical to the success of DOE efforts to curb waste and pollution. EM and Defense Programs are managing several integrated technology demonstration projects in cooperation with other Federal organizations, such as the U.S. Air Force. These projects will test and demonstrate technologies, processes, and materials to be used to reduce and, where possible, eliminate hazardous wastes.

Implementation of these projects by Defense Programs has already yielded many significant results. For example, Freon has been completely eliminated from depleted uranium machining

processes at the Oak Ridge Y-12 Plant, resulting in a 95 percent reduction in the plant's use of the ozone-depleting substance. At Los Alamos National Laboratory, proven and new technologies for minimizing liquid and solid wastes are being integrated into plutonium processing lines. Under DOE's newly integrated waste minimization program, these and other advances are being applied across the complex.

Cost Savings

The success of DOE's pollution prevention activities is reflected not only in improved environmental results but in substantial cost savings. For example, the first Waste Reduction Annual Reports from Field Offices and sites included data from seven EM and Defense Programs facilities and sites (the Kansas City, Mound, Pantex, and Pinellas Plants; the Savannah River and Hanford Sites; and Sandia National Laboratories) on 1990 cost savings from avoided waste disposal costs, avoided product purchase costs, materials substitutions, and reuse and recycling. These savings totaled more than $29 million. The 1991 annual reports provided cost savings data from a larger number of facilities and sites, and it is expected that these facilities and sites will show significant results.

Milestones for Pollution Prevention

During the FY 1994–1998 period, EM will continue to build pollution prevention into all its activities and to facilitate the integration of pollution prevention into all DOE operations. Opportunities for waste reduction activities are identified through specific Process Wastestream Assessments at individual facilities, which are then included in the site waste minimization plans for implementation. The ultimate goal is to establish DOE as an international leader in pollution prevention and waste minimization. This task will be accomplished through integrated pollution prevention activities. The program's effectiveness will be measured in terms of substantial, quantifiable reductions in the ratios between wastestreams and production activities, a progressive increase in the proportion of wastestream materials that are recycled, and growing operational efficiencies.

Several important milestones must be met in support of this objective. Two of these are completion of the Weapons Dismantlement Program Strategic Plan and determination of all regulatory requirements for treatment and disposal of weapons components (FY 1992).

Specific process requirements for weapons component treatment and disposal are targets for pollution prevention and hazard minimization. Another milestone is a 50-percent reduction of mixed waste in the nuclear weapons complex by FY 1995. A related activity is development of a comprehensive pollution prevention and hazard minimization program for miscellaneous DOE wastestreams to achieve 50-percent volume and toxicity reductions by 1995. Other important steps include initiation of DOE's participation in EPA's voluntary Industrial Toxics Project (FY 1993), the first update of the DOE's Waste Minimization Crosscut Plan (FY 1993), and the first annual report to the Secretary on waste minimization and pollution prevention activities and progress by all DOE programs (FY 1993). Waste minimization and pollution prevention activities are discussed in greater detail in Sections 2.1.0 and 2.1.1.

Issues and Strategies

The approaches employed in building pollution prevention into all DOE-wide activities must be carefully tailored to ensure that they not only meet program-specific requirements but also are consistent with and support all relevant facets of the National Energy Strategy.

To accomplish this task, it will be necessary to confront and resolve a number of issues. This section briefly outlines some of the most important of these and the strategies being pursued to address them.

How Clean Is Clean?

As discussed in Section 1.6.4, agreement has not been reached on what constitutes acceptable levels of contaminants in the environment, in facilities, or in recycled materials. To help forge such agreement, DOE will pursue cooperative relationships with the Nuclear Regulatory Commission and EPA to develop consensus on definitions and standards. A related issue is the need to eliminate unacceptable risk in pollution prevention and waste minimization activities. To address this issue, DOE will work closely with its stakeholders, including affected States and Tribes, to develop and implement appropriate definitions, standards, and methodologies to minimize risk while minimizing waste.

Pollution Prevention Goals

Another key issue is the lack of consensus within DOE on pollution prevention goals. The new Waste Minimization Crosscut Plan and the process followed in developing it are significant steps toward creating such a consensus. In cooperation with other parts of DOE, EM will continue to use the crosscut planning process and continuous improvement principles to develop and establish an aggressive pollution prevention program. Key objectives are to establish annual waste minimization goals for all DOE programs and to reward the use of "lessons learned" to encourage the application and sharing of waste minimization technologies to meet these goals.

DOE is investigating the manner in which it will participate in EPA's Industrial Toxics Project, also known as the "33/50" Program. The program asks companies and Federal agencies to voluntarily commit to waste reduction goals within certain time frames such as 33-percent reduction by 1992 and 50-percent reduction by 1995.

Recycling Programs and Incentives

Finally, a third key issue has been the limited nature and lack of coordination of DOE programs and incentives to promote recycling. In FY 1992, EM was assigned the lead for implementing DOE-wide recycling and waste reduction activities as a result of Executive Order 12780. EM and the Office of Procurement will represent DOE on the Council on Federal Recycling and Procurement Policy. One major requirement of the Executive Order is the data collection and reporting of recycling activities from every DOE site, building, and office. EM will be addressing these requirements as part of the continuing cooperative pollution prevention/waste minimization effort with other DOE programs. Recycling of paper, metals, used oil, equipment and other materials is being accomplished at a number of installations. Only those materials certified as radiologically uncontaminated are released for recycle. EM is currently evaluating the issue of recycling materials with very low radiological contamination for reuse elsewhere in the DOE complex. The outcome of this evaluation could have a significant influence on recycling/reuse of materials from facility decontamination and decommissioning.

1.6.7 HUMAN RESOURCES AND CAPITAL ASSETS REQUIRED TO SUPPORT EM PROGRAM IMPLEMENTATION

EM will ensure sufficient infrastructure to complete its mission by effectively estimating, developing, and providing for human resource and capital asset requirements.

Human resources and facilities are key components of the infrastructure needed to implement DOE objectives for environmental restoration and waste management. To fulfill near- and long-term commitments, the following should be available when needed:

- a sufficient number of educated and skilled Federal and contractor personnel;
- facilities for treatment, storage, and disposal of waste that has already been generated, that is produced by environmental restoration, or that is derived from decontamination and decommissioning;
- facilities such as analytical laboratories for characterizing waste, liquid, soil, air, and other samples; and
- additional equipment and capital assets.

Plans and programs are being established to train employees who may be affected by the changing missions of the DOE complex. EM will make every attempt to use employees now in the DOE system who can qualify for environmental restoration and waste management work before hiring from the outside. Coordinated EM-wide planning is needed to assess and provide adequate human resources, a cohesive and well-justified capital assets expenditure program, and sufficient facilities and analytical laboratories in the appropriate locations.

Human Resources

Work Force Assessment

The FY 1994–1998 Five-Year Plan provides estimates of the number of Federal and contractor personnel needed over the next five years (Figure 1.6.7). DOE is assessing the current and near-term demand for and the national supply of personnel trained and educated to achieve DOE environmental compliance and cleanup goals. This preliminary assessment predicts a 45-percent increase in scientific, engineering, and technical Federal and contractor personnel for EM activities across the complex for the FY 1989–1997 timeframe. Technical work force needs by site and relative criticality were identified, as well as the barriers the DOE complex faces in staffing those positions. Specifically, the preliminary findings include:

- The EM scientific, engineering, and technical work force is expected to grow from a 1991 base of approximately 13,800 to approximately 20,000 in FY 1997.
- Current high demand will continue to exist for chemical, mechanical, and environmental engineers; chemists; program/project managers; nuclear waste process operators; and health physics technicians. DOE also acknowledges the need for more qualified cost estimators identified by the Interagency Review Group.

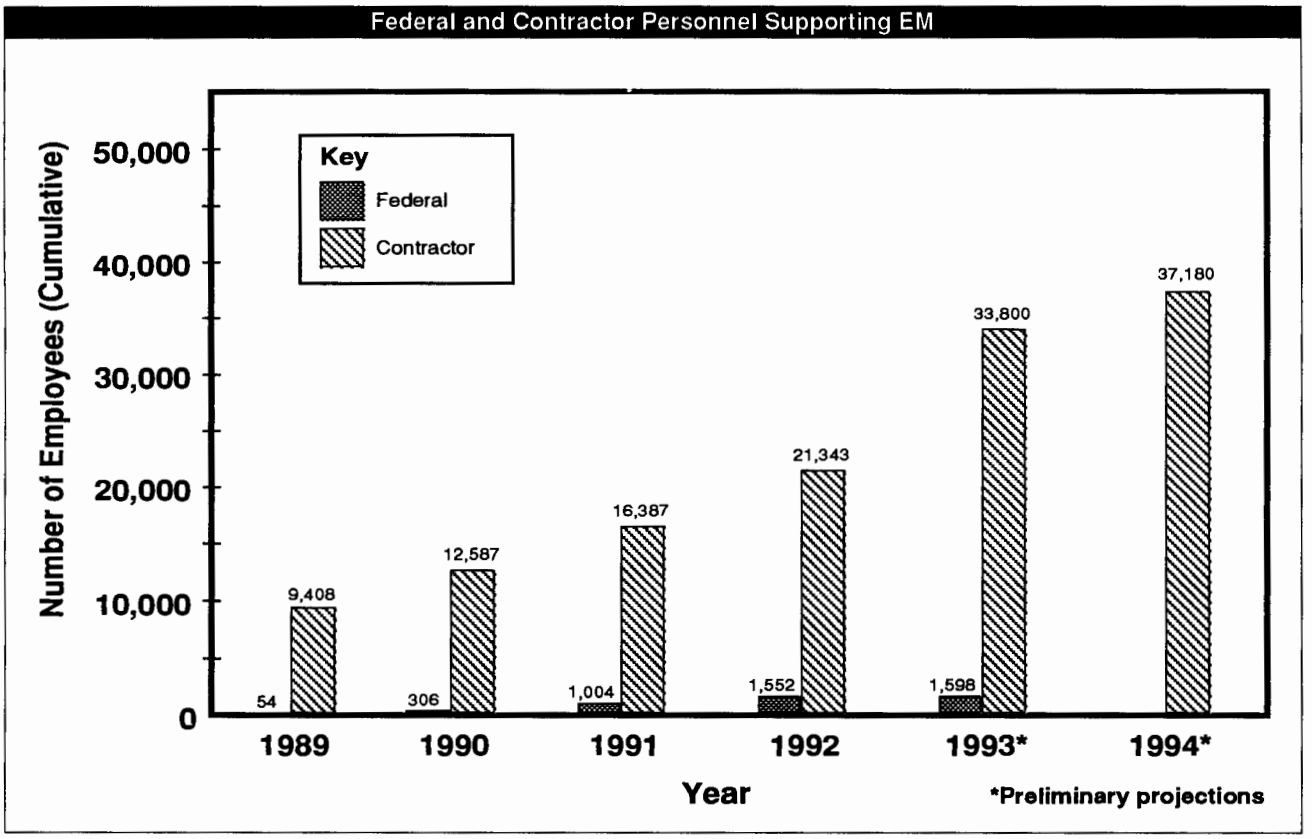


Figure 1.6.7. The number of Federal and contractor personnel is increasing to meet EM needs. Federal employee estimate for FY 1994 not yet available.

- Work force shortages are likely to occur mainly in those occupations unique to the DOE complex, such as radiochemists.
- Training and education should focus on A.S. and B.S. degree programs relevant to high-demand/ low-supply occupations. To attract individuals with advanced degrees, the DOE complex should focus on becoming an employer of choice.
- Training programs should also emphasize technical nondegree training and certification programs.
- More effort should be focused on assessing the capabilities and consequent training needs of workers in other DOE programs as sites transition from Defense Programs to EM activities.
- Internal and external resources should be used for worker training and retraining.
- Continued support of university research programs in environmental restoration-and waste management-related disciplines is needed to advance environmental science and engineering.
- Organizational and institutional issues must be addressed to fully capitalize on the skills available in both internal and external markets.

EM is currently developing a comprehensive sitewide system for work force planning by coordinating long-term strategic, mid-term programmatic, and short-term operational plans at selected sites. As the system is implemented across the complex and tied to the respective human resources organizations, it will enable DOE and its contractors to more accurately assess work force needs and availability within sites and across the complex.

The Manpower Assessment Action Plan, initiated by EM in 1991, found that the technology and regulatory issues related to EM activities are sufficiently complex that special education and training programs are necessary to ensure an adequate supply of properly trained people. According to the Action Plan, DOE

must take a number of steps to achieve this goal, including:

- implement at each site an integrated work force planning system that addresses local needs while providing national-level data to DOE Headquarters;
- develop a common taxonomy of occupations based on skills and capabilities rather than administrative or compensation-based factors;
- assess local work force resources for recruiting and retention; and
- develop and implement a training and education tracking system to assess the extent to which investments in these programs yield qualified individuals who accept positions within the DOE complex.

The Manpower Assessment Action Plan was released in the fall of 1992.

The overall scope of the effort to completely remediate DOE sites, properly treat and dispose of all wastes, and bring all operations into full compliance with State and Federal laws and DOE Orders is still evolving. What is clear, however, is that such an effort will require a significant number of skilled and experienced technical personnel.

As discussed in Section 1.2, three academic partnerships involving 25 colleges and universities were established to help ensure an adequate supply of technical professionals. The academic partnerships have developed courses to provide curricula relevant to DOE environmental problems. EM will implement training, education, and recruiting programs based on the initial work force assessment to ensure an adequate work force supply, particularly from underrepresented groups such as women and minorities. In addition, DOE is exploring the feasibility of establishing an environmental restoration and waste management research and analysis institute to serve as a center for technical excellence and expertise for advanced research and planning.

Meeting Human Resource Needs

When facilities no longer have a production mission, they may become the responsibility of EM for final disposition, whether for decontamination and decommissioning or simply refurbishment for further economic development. A comprehensive transition plan is written prior to facility transition to EM and human resource issues are a critical part of the plan. The Secretary of Energy has declared site workers' concerns a top priority, and EM intends to assist workers who may be displaced. The new facility mission may not require the same skill mix as before. DOE will therefore retrain as many of the present employees as necessary to meet the new requirements. If insufficient work is available, DOE will attempt to mitigate the impacts on the work force by offering skills enhancement training, retraining, and outplacement services to assist workers in finding positions elsewhere in the community.

Worker retraining will require DOE to better understand the tasks, job skills, and work force required to implement retraining programs at sites throughout the nuclear complex. For example, a pilot program to retrain production workers, supervisors, and technicians for environmental remediation was developed at Fernald in 1991. Approximately 130 employees participated. The program has been recognized as a successful method of retraining the work force and has been converted to an established program known as the DOE/ Westinghouse School for Applied Environmental Remediation. The program is a joint effort between DOE, the Fernald Atomic Trades Labor Council, and The Joint Training Venture, a consortium of labor unions including the International Union of Operating Engineers, the National Fire Fighter Union, and the Union of Construction Laborers. The three-week program enhances workers' skills through a combination of classroom and hands-on training. Subjects include Basic Environmental Laws and Regulations, Properties of Hazardous Materials, Principles of Radioactive Work, Confined Space Entry, Groundwater Management, Site Safety Plans, Emergency Response, Storage/Treatment/

Disposal of Hazardous Waste, Transportation of Hazardous Materials, and Occupational Safety and Health Administration and RCRA Safety Training.

In the short-term, progress will depend critically on retraining personnel with related experience. For example, the change in mission at some DOE sites provides a timely opportunity to involve these experienced technical and management people in the EM mission.

Capital Assets

Facility Planning Through Roadmap Development

Roadmaps, which are key elements of the strategic planning and issue identification process, were initiated at 36 sites. As discussed in Section 1.6.1, the roadmapping process identified specific treatment, storage, and disposal facilities, including new facilities needed to handle the waste from environmental restoration and decontamination and decommissioning activities. In addition, based on completed roadmaps, approximately 30 key issues have been identified requiring near-term resolution, including:

- the need for a complexwide treatment, storage, and disposal strategy;
- the need for RCRA-regulated residue storage; and
- the need for non-DOE treatment, storage, and disposal options.

Most site-specific roadmaps were completed in 1992. These results will be evaluated in Waste Stream Crosscut Analyses. By the end of 1993, national plans are expected to indicate what facilities will be needed, at what capacity, and when they will be needed. These data will assist in the preparation of the EM Programmatic Environmental Impact Statement.

Studies to Identify Treatment, Storage, and Disposal Facility Needs

The need for treatment, storage, and disposal facilities throughout the complex will be evaluated as part of the Programmatic Environment Impact Statement. Phase I of the EM Configuration Study, published in March 1992, provided support to the Implementation Plan for the Programmatic Environmental Impact Statement by developing broad treatment, storage, and disposal strategies. The strategies involve local, regional, and national alternatives for siting treatment, storage, and disposal facilities.

DOE will now evaluate needs for waste treatment facilities as well as storage and disposal capabilities. Analysis will identify waste at DOE sites that should be treated off-site at regional facilities and will catalog current facilities, their capacities, and additional capacity needed for on-site, high-level, and aqueous waste treatment and storage. As data on waste stream characterization and facility capabilities improve, DOE treatment, storage, and disposal choices will be reexamined.

Analytical Services

DOE relies on analytical services, such as environmental sampling and radiochemical, chemical, and physical analytical support, to properly conduct assessments of inactive waste sites and facilities. EM is responsible for ensuring that credible, cost-effective environmental sampling and analysis support is available. One way that EM tracks this support is through the Analytical Services Program Five-Year Plan. Published in January 1992, this plan describes the program, its activities, and its milestones.

Analytical Laboratory Needs

Because the demand for analytical laboratory services is expected to increase four to ten times within ten years, annual capacity projections will be developed and analyzed through an "analytical laboratories study." This study will evaluate national analytical laboratory capacity in relation to future needs and specific DOE/EPA/Department of Defense plans, including new regional analytical facilities. DOE will also foster establishment of more independent analytical laboratory capacity outside the DOE complex.

The Analytical Services Program will create a compendium of methods for field analysis of samples and an information management system to track the demands placed on the laboratory structure. This methodology will help ensure the accuracy of sample results and establish procedures to withstand legal scrutiny.

The initial version of the DOE Sampling and Analytical Methods Compendium completed assessment of mature field analysis technologies with two scheduled updates each year and formed a cooperative agreement with EPA on laboratory methods acceptability criteria.

National Analytical Services Plan

A comprehensive, national analytical services plan is under development. Through this plan, EM will examine the number and scope of required analyses, form strong partnerships with the commercial sector to supply some of DOE's sampling and analytical needs, identify gaps in available field analysis methods, and provide guidance to fill those gaps. DOE is also looking to cooperate with other Federal agencies in promoting efficient use of analytical resources.

In conjunction with other interested groups, DOE will determine the number and types of analyses that will be needed based on waste type (e.g., hazardous, mixed, or radioactive) and location, appropriate capacity and regional distribution of analytical laboratories, balance of capacity and capabilities of commercial and Federal facilities, and a schedule of when these facilities must be available.

1.6.8 EFFICIENT USE OF RESOURCES

In addition to ensuring the effectiveness of environmental restoration and waste management activities, EM is working to improve efficiency using a number of innovative approaches.

The first seven crosscutting objectives discussed in Section 1.6 address effectiveness—doing the right things. Efficiency, on the other hand, means doing things right. This objective concerns how to do the right things right.

DOE is increasing the ratio of compliance and cleanup activities achieved per dollar and time spent by (1) continuing to emphasize the development and implementation of new technology, (2) streamlining the environmental restoration process through "bias for action" strategies, (3) initiating a defensible system to estimate costs, (4) implementing new project management and control systems to monitor the progress and impact of all activities, and (5) planning for the orderly and cost-effective transition of contaminated surplus facilities to EM.

Technology Development

Increasing efficiency is the primary purpose of the Technology Development Program, as illustrated in Figure 1.6.8a. In accordance with an Interagency Review Group recommendation, the Technology Development Program is needs-based; that is, its activities are planned in response to explicit environmental restoration and waste management needs. Technology development efforts support efficiency goals using three approaches.

First, because all cleanups move through stages of site investigation, remediation, and monitoring, all sites can benefit from the application of better tools to carry out these actions. As a result, EM has established centrally managed research and development Integrated Programs organized around the kinds of activities required in each stage of the regulatory (i.e., CERCLA, RCRA) process.

Second, although no two DOE sites are confronted with identical problems, many of them are similar enough to plan generic solutions to systemic problems. Integrated Demonstrations were established to test generic problem-solving tools and then to customize the resulting technological system for use at other sites, based on systems-engineering concepts used successfully by industry.

Third, near-term requirements must be balanced with the long-term investment in high-risk, high-payoff research and development. Funding technology development supports two fundamental purposes: (1) to develop solutions to problems that cannot be solved with existing technology and (2) to dramatically improve the efficiency and effectiveness of current tools and processes.

DOE is augmenting its research funding with domestic and international technology transfer activities. If private sector and international technologies can be identified and their developers motivated (through streamlined procurement strategies and cost-shared research and development agreements) to risk developing them in view of profitable application, a significant source of new technologies can be tapped.

The first Integrated Demonstration is achieving success in removing volatile organic compounds from groundwater using horizontal well vacuum extraction and bioremediation at the Savannah River Site. The Buried Waste Integrated Demonstration at the Idaho National Engineering Laboratory Radioactive Waste Management Complex is also under way, and the schedule for all currently

foreseeable Integrated Demonstrations and Integrated Programs has been established.

Another means of ensuring efficient use of resources is to work with industry, universities, and other government agencies and programs to build collaborative partnerships that pool private and public resources. EM has created Technology Integration Programs, which are collaborative partnerships designed to serve two purposes.

First, the public-private partnerships are to be a vehicle that gives DOE access to the best available environmental technologies developed by industry, universities, national laboratories, government agencies, and international parties. Assuming a facilitator's role, EM will communicate and coordinate its technology development activities with these constituencies and DOE research programs.

The Technology Integration Program will also serve as an internal facilitator to communicate and coordinate activities within EM programs at Headquarters and in the Field Offices.

Second, the public-private partnerships are to serve as a foundation for a new U.S. environmental technology base that responds to national and international environmental restoration and waste management issues. As such, EM is committed to making EM-funded innovations available to entrepreneurs and private sector companies to commercialize marketable new or improved products and processes. EM will also work with State and local agencies to ensure that these innovations are available for use in regional economic development initiatives.

A vigorous Small Business Technology Integrated Program is also under way. More than 90 Cooperative Research and Development Agreements have been signed with private industry and academia, compared to only 15 a year ago. These agreements are expected to yield a broad range of technologies that can be applied to DOE environmental and waste management needs.

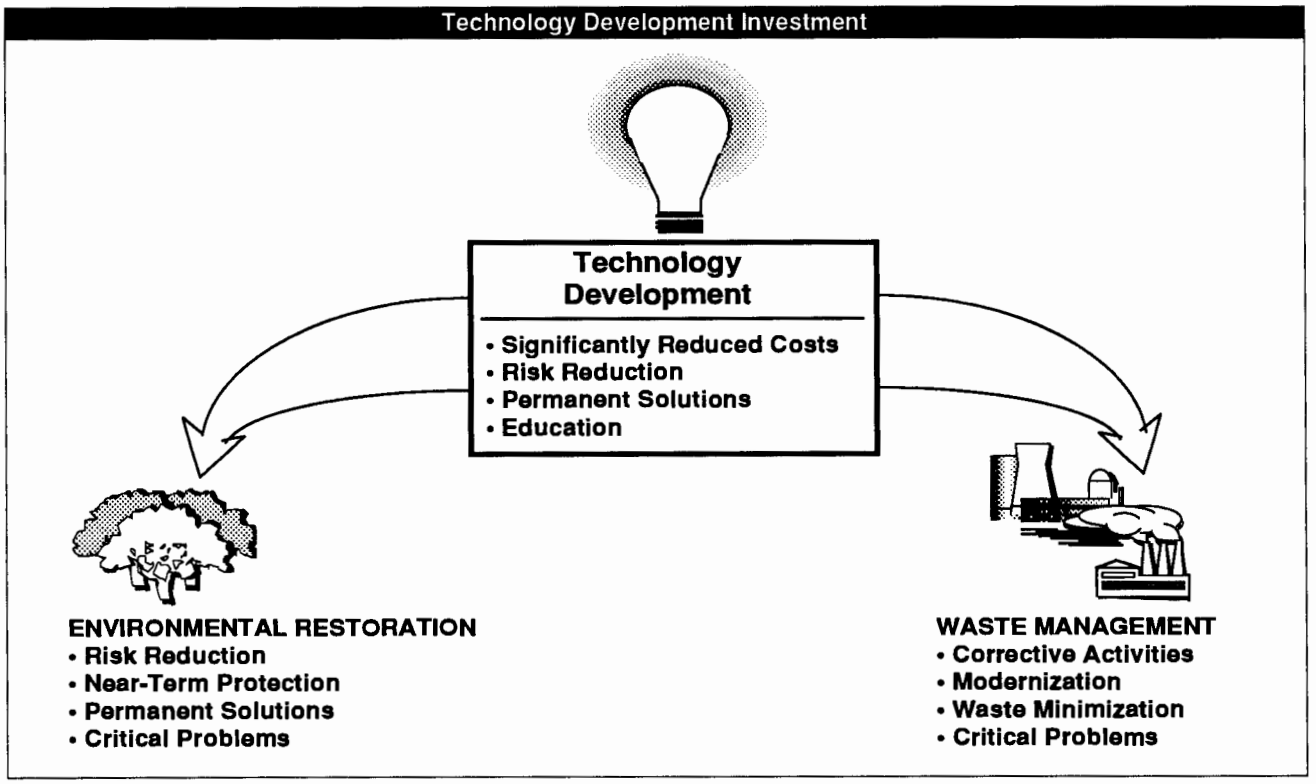


Figure 1.6.8a. Investments in technology development yield long-term cost savings and enhanced program effectiveness.

Environmental Restoration

Efficiency in environmental restoration means prioritizing near- and long-term needs to complete regulatory milestones and remediate sites. Part of this process is integrating technology development so that new or enhanced capabilities are ready for deployment in time to replace present technology. Since the FY 1993–1997 Five-Year Plan, a sharing of lessons learned among environmental restoration field personnel is promoting more effective use of existing or adaptable technologies for the assessment, cleanup, and decontamination and decommissioning of inactive sites and facilities. These efforts are supported by the new Mature Technologies Search Program, which identifies domestic and international technologies ready for use in remedial actions.

EM has also taken a major step toward streamlining the remediation process through "bias for action" initiatives at a number of sites. These initiatives are leading to Records of Decision one to three years earlier than originally planned, with significant cost savings. Several sites are working with their regulators to streamline the CERCLA decision process. Efforts include developing early consensus on the extent of site characterization required and models and analytical methods to be used, involving regulators more closely in the development of remedial investigation and feasibility study reports, and making maximum use of existing data on site contamination. Additional cost and schedule efficiencies are achieved by approaching investigation and actions on "aggregate areas" as opposed to individual operable units.

One example of the "bias for action" is the new Hanford Past Practice Investigation Strategy, which was developed to (1) accelerate decision making by maximizing the use of existing data consistent with data quality objectives and (2) undertake expedited response actions and/or interim remedial measures as appropriate—to either remove threats to human health and welfare and the environment or to reduce risk by reducing toxicity, mobility, or volume of contaminants.

Successful application of these strategies will result in (1) the reduction of time and money requirements, (2) greater stakeholder (including State and Federal regulators and the public) confidence and support of EM's environmental restoration efforts, (3) the use by others (e.g., EPA and private parties) involved in their own site remediation, (4) a reduction in the number of required sampling and analytical efforts, (5) an increased ability to meet Federal Facilities Agreement milestones, and (6) less renegotiation of Federal Facilities Agreements.

Waste Management

The Waste Management Program is also working to bring increased rigor into its estimation of costs and to support efforts to improve cost-effectiveness. Because only about 25 percent of its funding falls under the traditional projects umbrella, the Waste Management Program has introduced a new mechanism, Activity-Based Costing, for planning and control. Activity-Based Costing is a way to plan activities rather than resources so that resources are better used. For example, a past planning practice may ask for 12 people to operate a tank farm. With Activity-Based Costing, the plan breaks the operation down into the specific activities required to operate the facility and describes the resources required to complete each activity. The summation of those resources justifies the basis for the funding request. Activity-Based Costing gives an efficient tool for accountability, defensibility, and resource traceability.

The Waste Management Program also has been conducting integrated planning with the Technology Development Program through a comprehensive assessment of the technology needs to be addressed.

In November 1991, EM released the Interim Cost- and Schedule-Estimating Guidance for Waste Operations Baselines. This document outlines the development and use of the new Activity-Based Costing system and other cost control mechanisms. The Activity-Based Costing planning approach will provide a waste management baseline to continually gauge the impacts of programmatic changes and to evaluate opportunities for cost reduction and improve efficiency.

Transition Activities

Transferring a facility from the operating program to EM requires comprehensive planning by both parties to ensure an orderly, safe, and cost-effective transition. Normally, a facility will be required to be in a "safe, shutdown" condition, as defined by specific criteria discussed in Section 1.6.3, before transition from the program office. If the facility is not in this condition, negotiations between the operating program and will determine the financial resources that program offices will provide to EM to ensure safe shutdown of the facility. Comprehensive transition planning will support cost-effectiveness by optimizing resources, reducing surprises, and minimizing duplication of effort.

Oversight and Self-Assessment

EM is committed to quality assurance and quality control through the concept of self-assessment and through internal oversight. EM performs internal, independent oversight of programs and projects managed by its line organizations. This oversight is performed to ensure compliance with environmental, health, and safety laws and regulations and to enhance operations and maintenance, technical validity, and cost-effectiveness. EM has created innovative programs, such as the Cost Quality Management Program (discussed in Section 1.4) and the Operations Assessment Program, to facilitate oversight and maximize its limited resources.

The goal of self-assessment is for each employee to be responsible for continuously evaluating his or her own performance against specific performance objectives and to constantly strive to improve work effectiveness. It is EM's policy that all EM elements continually and critically evaluate programs, activities, operations, and facilities to identify environmental, safety and health, and safeguards and security successes and deficiencies; examine the adequacy and performance of management systems; determine root causes; ensure that corrective actions are taken; identify and communicate trends and lessons learned; and effect performance improvement. Through self-assessment, EM ensures that the procedures and practices of Field Office and Headquarters waste operations, environmental restoration, and technology development programs and activities comply with DOE Orders, Federal regulations, and accepted industry practices.

In order to foster excellence in EM programs and activities, EM provides technical guidance and assistance to the line programs. Guidance on environmental compliance issues such as the National Environmental Policy Act/CERCLA integration, on safety and health activities such as Safety Analysis Reports and Operational Readiness Reviews, and on cost-control issues has been developed and disseminated. Technical assistance in implementing this guidance is available to line and field organizations; teams of experts travel complexwide providing the additional expertise.

Issues and Strategies

Developing Program Management Capability

Although improvements are being made continually, insufficiently developed program management capabilities inhibit program effectiveness. Program management issues include the need for greater capacities for planning and analysis, improved cost-estimating procedures, qualified and sufficient personnel, and more streamlined and effective management oversight.

Strategies are being implemented by DOE to address these issues. For example, program management tools, such as the Progress Tracking System, are being put in place to enhance management capabilities. Cost estimating, including establishing appropriate contingencies, is being addressed through numerous self-assessment mechanisms and through management training on the Activity-Based Costing system. The problem of insufficient personnel is being tackled through education and retraining.

Timely Allocation of Technology Development Funding

The contribution of technology development to program efficiencies is limited by the fact that research funds must be invested early in the cleanup process to realize significant program benefits. Consequently, there is a need to demonstrate to the Office of Management and Budget and to Congress that what may appear to be discretionary technology development activities (i.e., not clearly driven by regulatory milestones or other mandates) are in fact crucial to regulatory compliance and ultimately to the success of the program.

The EM strategy is to support long-term technology development funding of about ten percent of its annual budget by creating an environmental management synergy among the national laboratories, universities, and industry. This alliance will promote environmental stewardship, U.S. scientific and technical competitiveness worldwide, and American jobs for solving environmental problems nationally and internationally.

Efficient Use of Resources

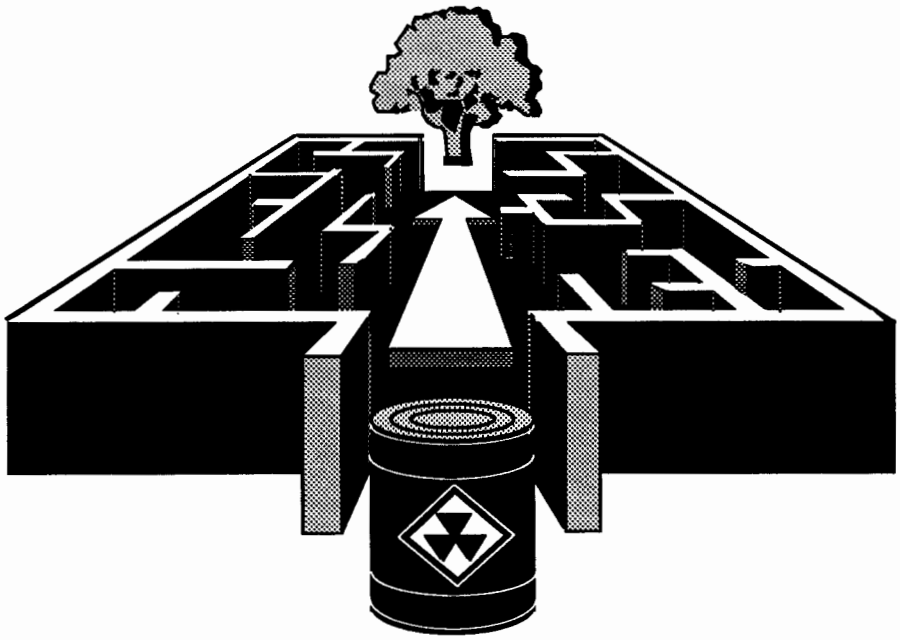


Figure 1.6.8b. The efficient use of resources will allow EM to avoid a circuitous route to program implementation.

1.6.9 ENSURING SAFETY AND HEALTH

Providing a safe workplace and protecting public health are requirements for all DOE programs; improving safety and health performance is a major policy initiative for EM.

The EM Safety and Health Program is based on implementing broad DOE safety and health goals and incorporating the unique requirements of environmental restoration and waste management activities. The key to implementing the program has been to place safety and health responsibility upon each individual within DOE and contractor organizations. This is accomplished through line management direction and personnel training on how to meet safety and health requirements and goals as well as line management oversight reviews and assessments to ensure compliance with requirements.

Oversight assessments conducted by Tiger Teams, the Office of Nuclear Safety, and the Office of Environment, Safety, and Health on behalf of the Secretary of Energy and self-assessments and oversight studies conducted by line managers have identified a large number of needed safety and health improvements throughout DOE. Given the magnitude of the improvements that have been identified, the Secretary has directed each major DOE program to develop a program-specific Safety and Health Five-Year Plan to delineate strategies and programs to reduce and manage safety and health risks. The separate program plans will be integrated into a consistent DOE-wide plan for risk-based resource planning and allocation. The DOE Safety and Health Five-Year Plan for FY 1994–1998 will be tied to the FY 1994 budget decision-making process.

The goal for the EM Safety and Health Five-Year Plan is to support the completion of needed corrective actions and to become the principal driver for future funding decisions on safety and health issues. The following sections discuss safety and health planning, an overview of safety and health functions, and issues and initiatives specific to EM.

Safety and Health Planning Process

The EM approach to developing its portion of the DOE Safety and Health Five-Year Plan has been to incorporate the safety and health planning process into the established planning framework. The EM Activity Data Sheets have been modified to encompass the additional data required for the Safety and Health Five-Year Plan. Consequently, all costs cited for safety and health program activities will be a subset of the total costs outlined for a particular EM project or program in an Activity Data Sheet. This accounting procedure ensures that the same cost validation measures applied to the Activity Data Sheets apply to safety and health costs.

One difficulty with determining and tracking the cost of safety and health activities is the frequent inclusion of safety and health activities in overhead accounts. The Secretary has expressed concern over the cost growth and lack of cost visibility for overhead charge activities in general. Consequently, new functional and overhead cost reporting formats have recently been requested by the DOE Controller's Office.

While the overhead issue is being addressed by the Controller's Office, the EM approach to the scope of activities to be included in the Safety and Health Five-Year Plan will emphasize clearly defined,

direct-funded safety and health activities related to a particular EM project. Consequently, the total cost numbers in this year's EM Safety and Health Five-Year Plan are likely to be somewhat underestimated. As overhead accounting issues are resolved, cost estimates will more accurately reflect the costs of the entire safety and health effort.

Safety and health planning relies upon the mandates of Executive Order 12088, which requires DOE to request funding necessary to meet legal requirements embodied in pollution control regulations such as the Federal Water Pollution Control Act and the Noise Control Act of 1972. EM will categorize all applicable safety and health activities by their underlying regulatory basis. Activities in each functional area will be identified as predominantly driven by (1) external legal requirements, (2) internal DOE Orders, or (3) other important programmatic bases, such as best management practices.

Safety and Health Functional Areas

For planning purposes, DOE safety and health activities have been divided into basic functional categories:

- operations (including nuclear safety);
- packaging, transportation, and emergency preparedness;
- radiation protection;
- occupational safety and health; and
- other safety and health activities.

Activities in these functional areas are described below.

Operations

This functional area includes operations and activities to provide equipment and procedures that affect safety and health or to upgrade existing safety and health capabilities at the EM sites, including safety and hazard analyses. This area also includes installation and maintenance of emergency response equipment and equipment to enhance safety and health and the testing and monitoring of safety and health facilities and systems.

Packaging, Transportation, and Emergency Preparedness

This functional area includes reviews needed for packaging and certification; coordination of the safety and health aspects of shipments of hazardous and nuclear materials; and evaluations of labeling, packaging, and shipments. It also includes maintenance and inspection of emergency facilities and equipment, emergency response team personnel training, emergency preparedness drills and exercises, and maintenance of site-specific emergency plans.

EM manages and funds emergency preparedness and occurrence notification and reporting programs throughout the DOE complex. The Facility Emergency Preparedness Program provides guidance and support for the development, implementation, maintenance, and appraisal of emergency plans, systems, and capabilities at EM sites. Efforts have resulted in a Headquarters Emergency Management Plan for Operational Emergencies, Headquarters emergency management team training, and emergency exercises conducted at specific facilities across the complex. The Transportation Emergency Preparedness Program supports DOE-wide preparedness for response to and mitigation of incidents involving DOE nonweapons radiological and hazardous materials shipments. This program has published a strategic plan and has conducted field emergency response training and emergency preparedness training exercises. Other initiatives in this area include a Handling and Operations Equipment Program, which involves the automation of waste handling and health physics operations to reduce occupational radiation exposure, and a Risk Analysis Program

aimed at development and application of analytical methods for assessing safety and health risks and consequences of transporting radioactive materials.

Radiation Protection

This functional area includes control equipment and procedures for radiation sources; interlocks, instrumentation, and shielding for radiation-generating devices; personnel dosimetry; bioassay programs; and radiation inhalation, ingestion, and exposure controls.

EM will expand existing radiation protection programs and will make the modifications and improvements necessary to correct identified deficiencies and to ensure that radiation protection programs address waste management and environmental restoration activities. Bioassay and personnel protection programs will be upgraded at several sites to support increases in environmental restoration and decontamination and decommissioning activities.

Oversight from the Headquarters level for radiation protection had previously been provided by the Office of Environment, Safety, and Health functional audits and Technical Safety Appraisals, and by Tiger Team assessments. The Office of Nuclear Safety has now assumed these responsibilities. These Headquarters-based controls continue to be the basis for EM oversight of this safety and health area.

Occupational Safety and Health

This functional area includes the control of hazardous or toxic materials; the control of physical hazards; hazards identification, surveillance, and communication; asbestos removal operation; hazardous materials handling and emergency response; posting of danger signs and tags or safety instructional materials; storage of pressurized gases; lockout and tagout activities; and explosive or combustible materials handling, processing, storage, transportation, and shipping.

Both DOE and EM are revising and strengthening their policies and guidance for occupational safety and health programs. An EM-specific requirements guidance document, "Occupational Safety and Health Program and Guidance," is in preparation. This document identifies the basic policy, responsibilities, authorities, program requirements and implementation criteria. This document will help ensure that EM offices and contractors develop state-of-the-art worker safety and health programs and will provide a base upon which audits and independent assessments can be performed.

Surveys have been conducted to determine current occupational safety and health resources, capabilities, and deficiencies in EM, and a detailed training program to mitigate deficiencies in personnel knowledge and skills has been implemented. An EM Occupational Safety and Health Steering Committee and a DOE Occupational Safety and Health Information Exchange Committee have been formed to foster the exchange of ideas and potential strategies. These approaches help transfer successful activities from one site to another. Additionally, special employee concerns programs have been developed to bring potential safety and health concerns to the attention of management.

Medical Monitoring and Long-Term Worker Health

DOE carries out a number of activities in support of its mission to protect the health and safety of workers and the public. For example, DOE has been involved for a number of years in the conduct of epidemiological studies of workers at DOE facilities, communities near DOE facilities, and other relevant populations. Some of these studies involve populations working at the time of the original Manhattan Project. To ensure the scientific credibility and integrity of epidemiology research, DOE has instituted a program that includes:

- transferring supervision of DOE health and mortality studies to the National Institute for Occupational Safety and Health;
- development of a broad Memorandum of Understanding with the Department of Health and Human Services to oversee analytic epidemiologic research for DOE;
- ensuring that all DOE-sponsored studies are subject to intensive peer review by the scientific community; and
- making the entire DOE data base of epidemiologic research accessible to independent researchers.

DOE has also initiated health surveillance pilot programs at the Hanford, Idaho National Engineering Laboratory, Rocky Flats, Brookhaven, and Savannah River sites. Unlike the analytic, or long-term, epidemiologic research, these programs are designed to provide a real-time assessment of employee health status. The health surveillance programs enable the immediate identification of workplace conditions that may pose unacceptable health risks, implementation of the necessary corrective actions, and identification of those members of the work force who may have been adversely affected so that they can be referred for appropriate medical treatment. The programs also enable comparisons across facilities and standardize epidemiologically relevant data that could be valuable to future studies. As necessary lessons are gained from these pilot programs, health surveillance activities will be expanded throughout the DOE complex.

To further ensure the protection of the work force, DOE has mandated that contractors' occupational health programs must be notified of known chemical hazards as they are brought into the workplace, that each facility's industrial hygiene program keep accurate records of the exposure level of each employee, and that all employees receive a thorough pre-placement physical that sets a baseline for the health status of the entering employee and documents previous exposure to occupational hazards.

DOE develops medical, occupational and surveillance policies, regulations, standards and guidance for use at DOE-owned, contractor-operated facilities. A team of physicians and nurses is sent to each contractor's occupational medicine program each year to assess the quality of the program and to ensure that these standards are met. DOE is currently working with the contractor medical program directors to establish an automated roster of all DOE and contractor employees that will contain the hazards to which the employee is exposed. This represents the first time such an effort has been undertaken at DOE and will enable a meaningful health profile of every employee to be properly established and maintained so that DOE has an accurate portrayal of the health of the work force.

Other Safety and Health Activities

The remaining safety and health functional areas include management and administration, occupational medical services, firearms safety, and aviation safety. Management and administration includes activities such as oversight, corrective action tracking, self-assessment, quality assurance, and training. Occupational medical services include medical procedures, services, and facilities; employee wellness and health counseling; medical emergency and disaster preparedness; and medical staffing and support. The firearms safety category includes activities to control the use of firearms, such as training in the use of firearms and firearms range upgrades or modifications to reduce risks and hazards. Aviation safety addresses the activities needed to meet Federal aviation requirements at EM sites.

Issues

EM must develop, implement, and sustain a structured, integrated, and accountable safety and health program. Tiger Team reviews have found numerous instances of noncompliance with DOE Orders throughout DOE. Many of these are site- or activity-specific, such as identification of potentially unsafe electrical connections or improper labeling of hazardous waste.

Throughout DOE there is concern that operating organizations may not clearly know and understand what specific safety and health requirements apply to them. This concern, in part, led to the Defense Nuclear Facility Safety Board Recommendation 90-2, in which DOE was asked to define which Orders specify safety and health requirements to examine the timeliness of specific standards and requirements, and to analyze industrial consensus and other standards to determine whether they should be used to define safety and health requirements rather than current DOE Orders. This procedure is to be followed by an assessment of the level of compliance at the operating level. Corrective action plans will be developed to correct deficiencies noted in this assessment. In addition, facility- and project-specific safety analysis reports will be reviewed annually against requirements and updated as necessary.

Many EM activities relate to handling mixtures of hazardous or toxic chemicals and nuclear waste materials. EM must integrate into a single, cohesive effort requirements normally associated with providing safety and health protection from hazardous materials with the requirements developed for the safe control of nuclear material.

Secretary Watkins has reorganized line management to take full responsibility for environmental, safety, and health activities. This reorganization has meant that responsibilities previously addressed in the Office of Environment, Safety, and Health have been transferred to offices like EM. However, existing DOE professional expertise for some specialized safety and health functions still remains in the Office of Environment, Safety, and Health. Recruiting for these skills is difficult because of a short supply of experienced personnel, particularly people with the combined nuclear, environmental, and/or waste management expertise essential to EM operations. EM is developing training, qualification, and certification programs for its existing and future staff, but satisfying the requirements for trained program and line managers and workers will take some time.

In addition to obtaining specialized safety and health professionals, EM is also working to improve the safety and health skills of all personnel. In the workplace, workers and managers not trained in safety and health standards may be accustomed to seeing a particular situation or process without recognizing it as a potential hazard. Site reviews by the Tiger Teams noted several hundred conditions that did not meet current Occupational Safety and Health Act requirements, including electrical safety problems, confined space entry, and lack of adequate posting of emergency signs. Some training of the DOE and contractor staff has begun, but a change in EM culture to continually emphasize the more routine aspects of safety and health is required to provide the confidence that the DOE policies are understood and are being implemented at all organizational levels.

EM is committed to funding all necessary safety and health activities. Because of the need for significant resources, however, prioritization may emerge as an issue with regard to EM safety and health efforts. Another potential issue emerges when safety and health needs are compared to environmental needs—when should funds go to cleanup activities and when should they go to safety upgrades? When EM takes ownership of former defense production facilities, the applicable safety requirements are based on production operations for the former defense mission. Therefore, safety analysis reports, technical safety requirements, operating procedures, and safety equipment may not be suitable for shutdown facilities or facilities undergoing

decontamination and decommissioning. The hazards associated with nonproducing facilities are likely to be different, and possibly less severe, and the safety requirements (some of which are very costly) often must be adjusted to reflect this. EM must make an orderly but rapid reduction in unnecessary and/or inappropriate requirements to reduce costs while still providing for necessary safety protection.

Initiatives

Development of EM guidance is under way for broad areas such as safety analysis reports, operational readiness reviews, Occupational Safety and Health Administration programs, self-assessment, and quality assurance. In addition, guidance for specific issues, such as employee concerns programs, including "whistleblower" protection, and the processing of exemptions to DOE Orders is also in progress.

Draft guidance for conducting compliance-based operational readiness reviews has been developed. Facility-specific operational readiness reviews have been conducted (at the Waste Isolation Pilot Plant, the Savannah River 1-H Evaporator, and the Idaho waste calciner, among others) as facilities approached operational status. Operational readiness reviews identify specific tasks requiring completion before facilities can be certified to commence operation. The Waste Isolation Pilot Plant Operational Readiness Review, conducted during the summer of 1991, was a comprehensive, independent assessment of the readiness to commence the dry bin-scale test phase of operation and is now used by others as an example of what is required in an operational readiness review.

Guidance on how to implement a DOE performance indicator program has been issued to all appropriate field facilities. The program tracking the performance of 33 indicators for 40 facilities is heavily weighted toward safety- and health-related items. Workshops aimed at proper implementation of the requirements at the facility level have been conducted, and an integrated data base is being implemented by the separate facilities. EM has issued three quarterly reports summarizing the status of the facilities in the program.

DOE has required that each organization prepare its own self-assessment program to evaluate environmental, safety, health, quality assurance, and safeguards and security activities. The self-assessment programs must also identify the root causes of findings and track resolution to completion. In response to the self-assessment requirement, EM has issued a draft Self-Assessment Program Plan.

PART 2

PROGRAM PLANS

2.0 INTRODUCTION – PROGRAM-SPECIFIC PLANS

Although described in the FY 1994–1998 Five-Year Plan as five separate activities, the individual programs are closely related and are focused on achieving a set of program objectives that jointly support the Strategic Plan for Environmental Restoration and Waste Management.

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

Waste Management

The Waste Management Program focuses on 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 2.1 provides a thorough overview of the Waste Management Program along with highlights and accomplishments for the past year. Program status for major subprograms, including Waste Minimization, High-Level Waste, Transuranic Waste, Mixed Low-Level Waste, Low-Level Waste, Hazardous Waste, and Sanitary Waste, is also discussed.

Environmental Restoration

The Environmental Restoration Program is concerned with all aspects of assessment and cleanup of both contaminated facilities 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 2.2 provides an overview of the Environmental Restoration Program, describes the implementation of Environmental Restoration Program activities, and summarizes accomplishments since the FY 1993–1997 Five-Year Plan. It also presents Field Office environmental summaries, which include descriptions of the Environmental Restoration Program at each of the Field Offices.

Facility Transition and Management

Facility Transition and Management, EM's newest initiative, was launched to handle the burgeoning task that is a consequence of the downsizing of the weapons complex—the transfer of facilities to EM from other DOE programs. The deactivation of weapons production facilities creates new waste management and environmental restoration challenges for EM. Section 2.3 contains an overview of the program, discusses its systems integration approach, and highlights the program's accomplishments and future plans.

Technology Development

The Technology Development Program was 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. The Technology Development Program is also concerned with ensuring the availability of a technical work force.

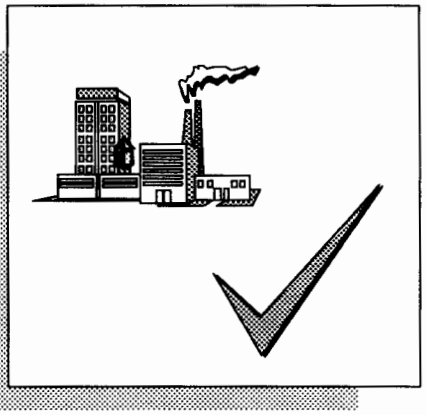
Section 2.4 addresses the Technology Development Program, including its mission and overview. The vision of the program is illustrated through descriptions of integrated demonstrations and

integrated programs, listing accomplishments generated by the Technology Development Program. This section also highlights strategies and describes the status of technology integration and environmental education initiatives.

Transportation Management

The Transportation Management Program is responsible for 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 is an overriding objective of this program. The Transportation Management Program is responsible for coordinating the response to adverse occurrences in EM operations.

Section 2.5 presents the program's missions and mandates. This section gives the scope and accomplishments of key elements of the Transportation Management Program.



Corrective Activities and Waste Management

2.1.0 PROGRAM OVERVIEW – THE EM WASTE MANAGEMENT PROGRAM

The mission of the Waste Management Program is to minimize, treat, store, and dispose of DOE waste to protect human health, safety, and the environment.

The Waste Management Program has the following objectives (Figure 2.1.0):

- assist with the development of annual waste minimization goals for all DOE programs that generate waste and help generators achieve those goals;
- reduce regulatory uncertainty and conflict;
- optimize management of major waste streams across DOE;
- implement a uniform, comprehensive management system;
- improve public understanding and participation; and
- manage waste more safely, effectively, and economically.

The Waste Management Program will use current technologies to minimize production of DOE-generated waste, alter current processes to reduce waste generation, and work with the Technology Development Program to develop innovative technologies for the treatment and disposal of present and future waste streams and for waste minimization. Performance will be evaluated by determining the percentage reduction in waste generated per unit of output from DOE programs and by requiring, monitoring, and rewarding the use of "lessons learned" or similar systems to share waste minimization technologies.

Regulatory uncertainty and conflict will be reduced by developing joint Federal and State environmental compliance agreements, by increasing participation in rulemaking, and by increasing the use of Memoranda of Understanding with regulatory agencies. Success will be evaluated by reduced enforcement actions and by decreasing time for EPA and State approval of Waste Management Program activities.

Management of major waste streams across DOE will be improved by upgrading existing facilities to maintain or obtain compliance and by implementing the siting strategies for each major waste type from the Record of Decision for the EM Programmatic Environmental Impact Statement. Performance will be measured by lowering unit cost for waste stream management, by reducing the amount of land devoted to waste management, and by reducing risk attributable to DOE waste and waste operations.

A uniform, comprehensive management system, including establishment of technical, cost, and schedule baselines, is planned for implementation in FY 1993. Current efforts focus on the integration of existing systems rather than the creation of new systems. Success will be measured by having the management systems in place as scheduled and developing a clear statement of how the management systems interact.

Efforts to improve public understanding and participation in the Waste Management Program will focus on increasing public outreach and communication. DOE operates under a policy of openness, and program managers must maintain effective communication with the public, stakeholders and other interested parties. Success in this area will be evaluated by increased acceptance and support of DOE waste management activities.

Safer, more effective, and more economic management of waste will be achieved by implementing a risk-based approach to the allocation of resources; by promoting the development of innovative technologies; by ensuring achievement of performance objectives at disposal sites through comprehensive systems engineering; and by striving to progress from higher to lower risk phases of waste management. Success will be evaluated by measuring the reduction in cost/resources required per unit of waste treated or disposed of; by measuring the progress by waste type (volumes treated, amounts disposed of, amounts moved to improve storage, amounts treated); by measuring the progress in the transition of waste from storage to disposal for all waste types; and by measuring and tracking the safety record.

The following sections describe the accomplishments and plans of the Waste Management Program. Corrective Activities and the major waste types managed by the Waste Management Program (high-level, transuranic, low-level, commercial low-level, mixed low-level, hazardous, and sanitary) are discussed. Major initiatives, such as waste minimization and program management improvements are also discussed, as are issues and strategies affecting attainment of program objectives.

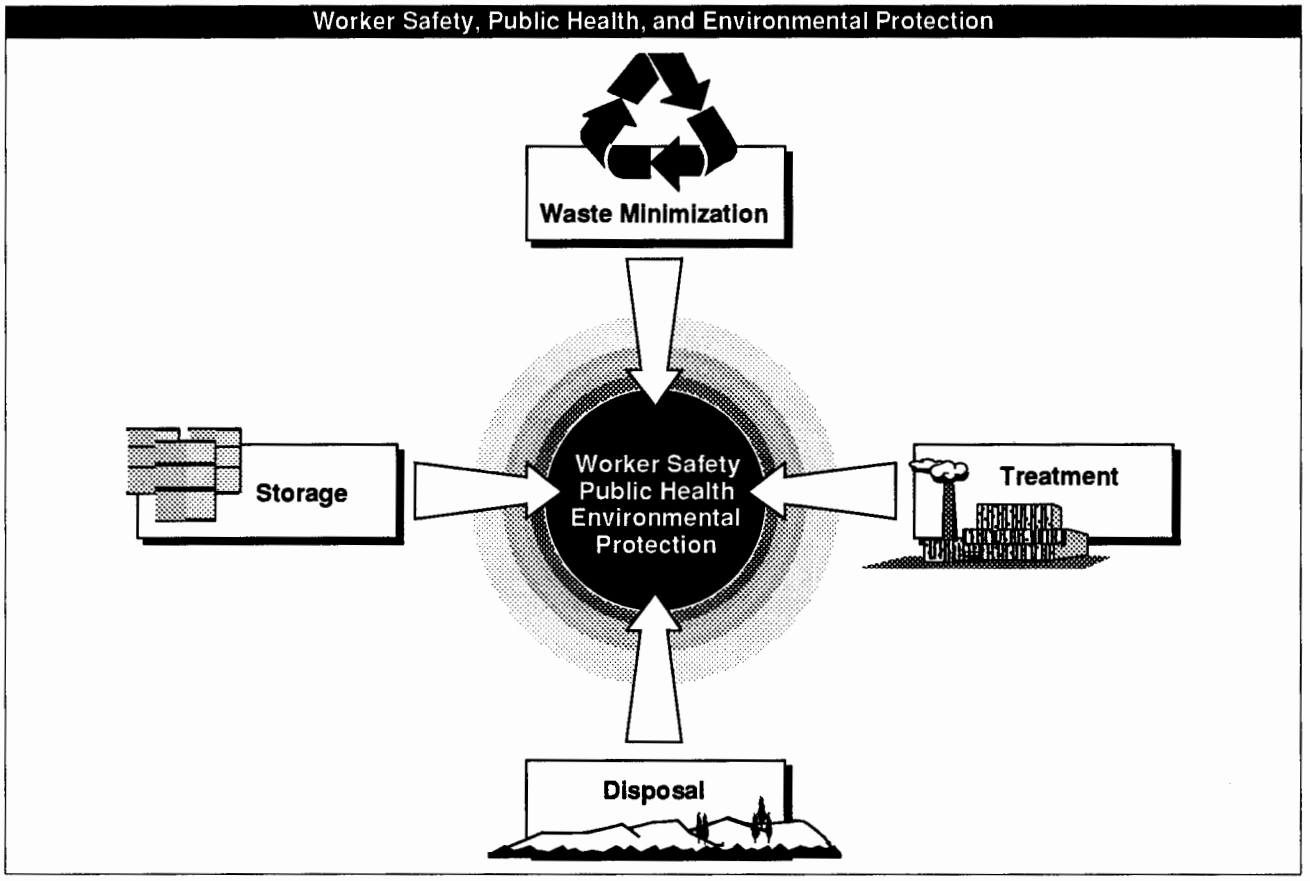


Figure 2.1.0. The mission of the Waste Management Program is to minimize, treat, store, and dispose of DOE waste to protect worker safety, public health, and the environment.

2.1.1 WASTE MINIMIZATION

A comprehensive waste minimization program will significantly reduce the costs for DOE-wide environmental compliance and cleanup through major reductions in the amount of waste requiring treatment, storage, and disposal.

Minimization of all types of waste is an integral part of the Nation's and DOE's overall efforts to improve environmental quality, conserve scarce resources, and reduce health risks to workers and the public. An aggressive waste minimization program within DOE can provide additional benefits, such as improved regulatory compliance; enhanced credibility with the public, regulators, and other government entities; improved production efficiencies; and prolonged, useful life of current and proposed disposal capacity (Figure 2.1.1.).

The waste minimization program will develop, promote, and implement cost-effective waste minimization technologies, practices, and policies in conjunction with partners in government and industry; conduct DOE operations in an environmentally sound manner in compliance with all applicable laws and regulations through reducing pollution; and improve the economic competitiveness, energy security, and environmental quality of the Nation.

With the DOE weapons mission in transition and more facilities and sites being decontaminated, decommissioned, and restored, waste minimization will play an increasing role in reducing the amount of waste generated by DOE research, operations, and restoration programs.

Defining Waste Minimization

Within DOE, waste minimization is defined as "an action to economically avoid or reduce the generation of waste by source reduction, improving energy usage, or by recycling." Source reduction may be accomplished by modifying processes, substituting materials used in processes, and improving housekeeping and management practices, including recycling, within a process. Recycling is the use or reuse of a waste product or the reclamation of portions of a waste product.

Waste minimization may not always result in reduced production costs as processes are modified, as substitute materials are introduced within processes, or as products are recycled. The underlying principle of a waste minimization program is to decrease the volume and potential hazards of waste generated by a process to minimize the treatment, storage, and disposal requirements of that waste. Thus, any production cost increases are offset by the reduction in costs of managing the waste through final disposal.

Legal Requirements

The legal and regulatory environment affecting waste minimization policy, planning, and implementation will become more demanding in the future, thereby resulting in increasing expenditures on environmental compliance activities. A change in emphasis by Federal, State, and local regulators from "end of the pipe" pollution controls to "front-end" waste minimization and pollution prevention will increase requirements on DOE for an effective waste minimization program. Waste minimization and pollution prevention are discussed in Federal and State laws, DOE Orders, and regulations and have been incorporated into consent agreements and regulatory permits for DOE facilities and operations.

DOE Waste Minimization Program

DOE management has recognized waste minimization as a critical, high-priority area for

reducing the rapidly escalating costs of environmental compliance and waste management. All DOE sites generating hazardous, radioactive, or mixed waste prepare plans and reports on their waste minimization activities. These plans and reports detail the types and volumes of waste streams being stored or generated, site-specific reduction goals, and strategies for preventing or minimizing additional generation of pollutants (including employee suggestion and training programs). Additionally, several DOE organizations (e.g., the Office of Defense Programs and the Office of Conservation and Renewable Energy) are establishing comprehensive waste minimization programs. DOE complexwide goals will ultimately be established to provide minimum standards for each Field Office or program.

Within the Waste Management Program, the Waste Minimization Division has DOE-wide coordination, consolidation, and policy guidance responsibility for waste minimization activities. Responsibility for implementing waste minimization at DOE facilities and sites is assigned to the respective Program Secretarial Office line organization. The Office of Conservation and Renewable Energy, through its Office of Industrial Technologies, emphasizes cooperation and cost-sharing with industrial partners for technology development, waste management research and development, energy conservation, and information and technology transfer.

Recent Activities

In 1991, EM conducted a review and analysis of revised site waste minimization plans and the first annual site waste reduction reports. EM also facilitated information and technology exchange throughout DOE by conducting workshops and maintaining an electronic bulletin board.

All DOE sites have formulated waste minimization policy statements and strategies for program implementation. Information exchange, training programs, and process waste assessments have begun. Many cost-efficient waste minimization strategies have been implemented at a number of sites, and their successes have been documented (e.g., in the Defense Programs newsletter *Pollution Prevention Advisor*). Recycling programs are in varying stages of implementation at DOE installations for materials such as paper, cardboard, toner cartridges, solvents, used motor oil, antifreeze, and cleaning rags.

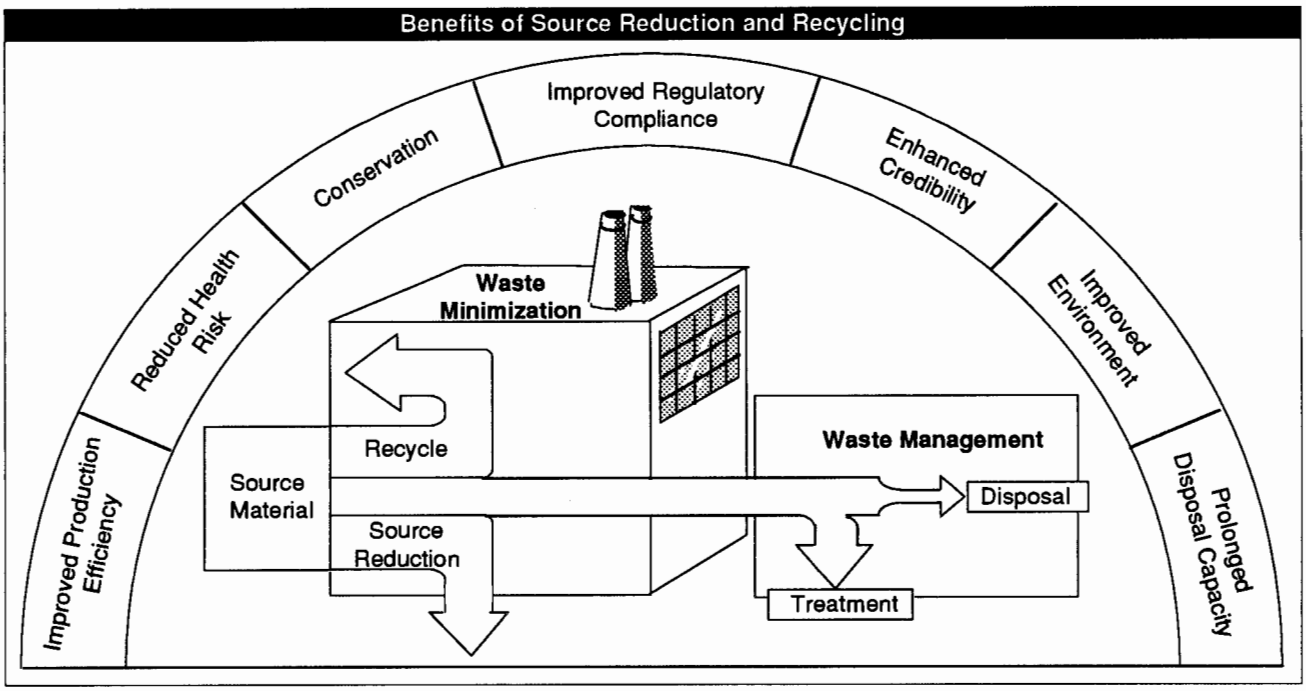


Figure 2.1.1. Source reduction and recycling of all materials used in DOE operations provide many significant benefits.

Materials are generally determined to be recyclable when a market for used materials exists, technology is available, cost-effective methods exist, and when resources are available to carry out the program.

EM had the lead for a DOE-wide initiative in FY 1992 to comply with the requirements of Executive Order 12780 on Federal Agency Recycling and Procurement Policy. This Order requires that Federal agencies promote cost-effective waste reduction and recycling of reusable materials from waste generated by Federal Government activities. DOE must report to EPA and the Office of Federal Procurement Policy on the adoption of an affirmative procurement program and must annually review the program's effectiveness. Also, a large requirement is the data collection and reporting of DOE-wide recycling activities from every DOE site, facility, building, and office.

On November 27, 1991, the Secretary of Energy directed preparation of a crosscut waste minimization plan, encompassing all DOE organizations, facilities, sites, and activities. The final Waste Minimization Crosscut Plan was approved by the Secretary on February 26, 1992. The plan provides a DOE-wide framework for effective coordination of all waste minimization activities, identifies key objectives and success indicators, and outlines strategies aimed at establishing DOE as a leader in waste minimization activities.

On May 13, 1992, the Secretary also signed Secretary of Energy Notice 37-92, "Waste Minimization Crosscut Plan Implementation." To implement the Secretary's notice and to provide DOE-wide leadership for waste minimization and pollution prevention activities, the Secretary established a Waste Minimization and Pollution Prevention Executive Board within DOE. This Board is composed of the heads of each Program Secretarial Office; the Office of Environment, Safety, and Health; the Office of Procurement, Assistance, and Program Management; General Counsel; and the Office of Domestic and International Energy Policy. The Executive Board is responsible for development and coordination of a DOE-wide waste minimization program.

To coordinate implementation of the Waste Minimization Crosscut Plan and assist the Executive Board in carrying out its actions, the charter, responsibilities, and activities of the existing DOE-wide Waste Reduction Steering Committee were expanded. This committee, composed of senior representatives from each DOE organizational office, reports directly to the Executive Board and is responsible for the review, coordination, and accomplishment of waste minimization activities required to achieve the DOE Waste Minimization Crosscut Plan initiative.

Next Steps

A Secretarial Memorandum to Departmental Elements on waste minimization and pollution prevention was approved by the Secretary on August 20, 1992. This memorandum was developed through a DOE-wide consensus-building process involving Field Office and Headquarters representatives. The Executive Board must also submit to the Secretary a revised Waste Minimization Crosscut Plan on February 15, 1993, and a DOE-wide Annual Waste Minimization Report on April 30, 1993. These actions will help establish and promote awareness and commitment to waste minimization throughout DOE.

2.1.2 CORRECTIVE ACTIVITIES

The highly successful, but separate, Corrective Activities Program is being incorporated into the Waste Management Program.

The Corrective Activities Program, started in 1989, managed a limited set of high-priority, short-term, special projects designed to bring out-of-compliance facilities into compliance with applicable environmental laws and regulations. Many of these activities were, or are being, corrected in close consultation with regulatory agencies. In some cases, compliance agreements have been negotiated to focus attention on completing these activities. As shown in Figure 2.1.2, the number of activities in this program has been dramatically reduced.

Corrective activities encompass a full spectrum of media and waste types and typically involve regulatory control of chemical compounds and radioactive materials. A large fraction of DOE facilities date from the 1940s and 1950s. The materials and methods of construction reflect a period when their impacts on environment, safety, and health were less understood 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, physical plants and structures have deteriorated significantly. Some of the major corrective activities have included isolating PCB-impregnated gaskets at the gaseous diffusion plants; reducing cooling water discharge to ensure cooling water discharges do not exceed standards for chloride, temperature and total suspended solids; and replacing and repairing deteriorated sanitary sewer lines and treatment facilities.

The Corrective Activities Program was established as a limited category of projects designed to correct specific situations in which a facility or installation was out of compliance with applicable environmental laws and regulations. Only those compliance problems requiring immediate resolution were included in this program. The Corrective Activities Program is very limited, which created some confusion to readers of the Five-Year Plan. For instance, the program does not include projects that implement provisions of compliance agreements. It is also EM policy that a situation in which an operating facility or installation (e.g., a Defense Programs production facility or an Energy Research demonstration facility) is out of compliance is the responsibility of the responsible Program Office. Funding to bring the facility or installation into compliance is provided through the sponsoring program's standard budget process. Within EM, projects to correct a compliance problem at an operating waste treatment, storage, or disposal facility, for instance, are included in the Waste Management Program Activity Data Sheets for that facility. The Corrective Activities Program therefore does not represent all DOE projects designed to bring facilities and operations into compliance with environmental laws and regulations, nor does the completion of this program in FY 1997 mean that all EM or DOE facilities will be in full compliance by then.

As in past years, when activities were funded under the Corrective Activities Program, DOE will develop and fund activities with the same firm commitment to operate its facilities in full compliance with applicable requirements. Similar care and emphasis will be placed on expeditious correction of out-of-compliance situations. Particular emphasis is being placed upon project identification and full cooperation with regulatory agencies. DOE continues to aggressively assess its compliance posture and assign to the appropriate program element the responsibility for funding and project management.

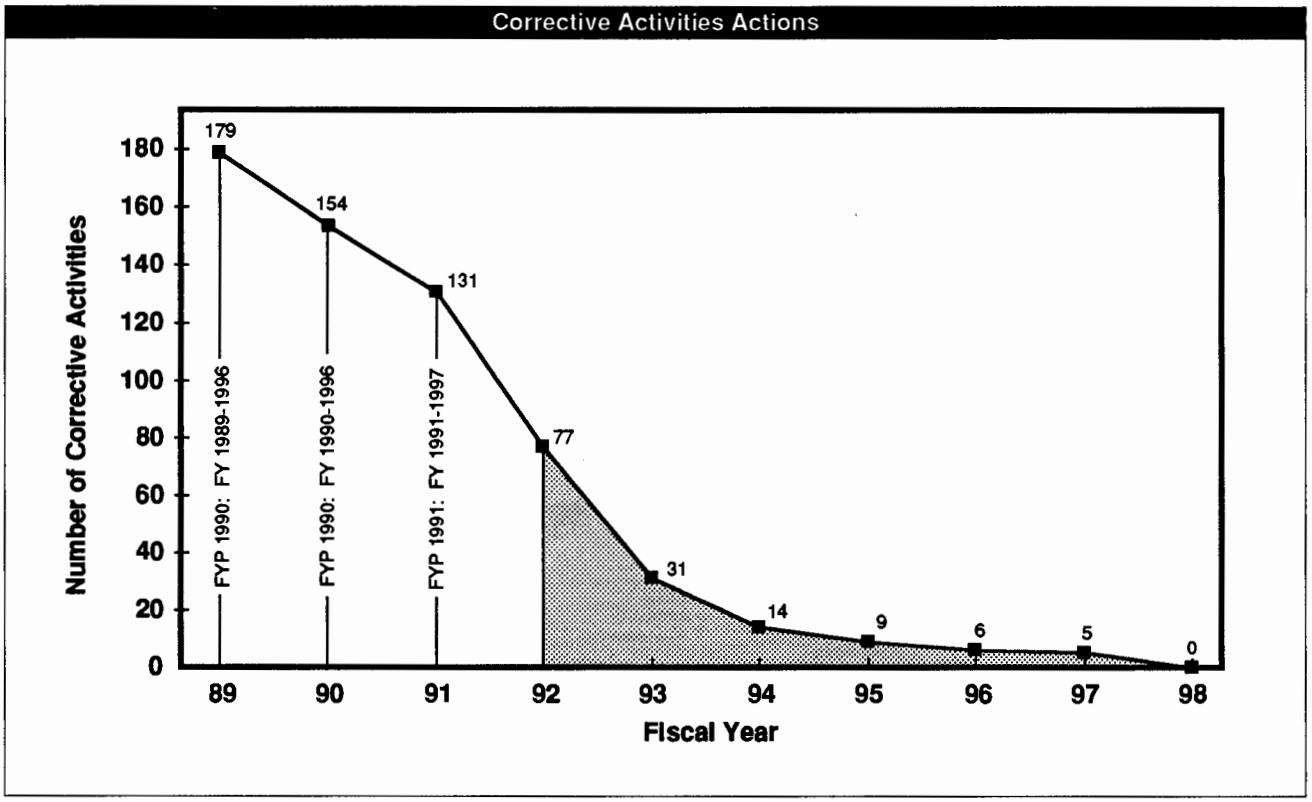


Figure 2.1.2. The number of actions in the corrective activities category is rapidly declining.

2.1.3 HIGH-LEVEL WASTE AND SPENT NUCLEAR FUEL

Successful development, demonstration, and deployment of treatment technologies will ensure that high-level waste and spent nuclear fuel are managed safely and are suitable for disposal in a mined geologic repository.

High-level waste and spent nuclear fuel originate from different sources and require distinct handling, although the Nuclear Waste Policy Act of 1982 required that they both be safely stored, transported, and finally disposed of in a mined geologic repository.

Spent nuclear fuel consists of irradiated fuel discharged from a nuclear reactor. This fuel may be reprocessed or may be considered as permanently discharged and eligible for repository disposal. Spent fuel may be generated from commercial nuclear power reactors or be classed as special fuels associated with government-sponsored research and demonstration programs, universities, and private industry.

High-level waste is the highly radioactive material resulting from the reprocessing of spent nuclear fuel or from defense production processes. This material includes liquid wastes, sludges, calcines, or other products remaining from the recovery of uranium and plutonium in a fuel reprocessing plant. Such waste contains fission products that result in the release of considerable decay energy. As a result, heavy shielding is required to control penetrating radiation and to dissipate decay heat.

The Office of Civilian Radioactive Waste Management within DOE was established in response to the Nuclear Waste Policy Act to develop, manage, and operate a safe disposal system for high-level waste. The Office of Civilian Radioactive Waste Management was given the responsibility to site, construct, and operate a deep, mined geologic repository; to site, construct, and operate a monitored retrievable storage facility; and to develop a system for transporting the waste to a repository and a monitored retrievable facility. In coordination with the Office of Civilian Radioactive Waste Management, EM is managing inventories of spent nuclear fuel and high-level waste until the repository is available.

DOE has recently announced the shutdown of reprocessing facilities at the Idaho Chemical Processing Plant and other locations in response to the changing political climate. With the declining need for reprocessing of spent nuclear fuel to recover fissile uranium, DOE still retains responsibility to manage this material. Plans, such as the Idaho Chemical Processing Plant Spent Fuel and Waste Management Technology Development Plan, are being prepared to address changing missions of facilities from reprocessing to developing technologies and processes for geologic disposal.

High-Level Waste

High-level waste generated by DOE defense activities is stored in underground storage tanks at the Savannah River Site, Idaho National Engineering Laboratory (INEL), and the Hanford Site. Much of the high-level waste is alkaline liquid, sludge, salt cake, or slurry. At INEL, acidic high-level waste is dried to a calcine (a granular solid) and stored in steel bins inside concrete vaults. A small amount of high-level waste generated in commercial activities at West Valley, New York, and owned by the New York State Energy Research and Development Authority, is also stored in underground storage tanks. The total DOE high-level waste volume of about 381,000 cubic meters contains some 1.1 billion curies of radionuclides. Very little additional high-level waste is expected to be generated as a result of environmental restoration activities.

The Nation's high-level waste is to be disposed of in a deep geologic repository licensed by the U.S. Nuclear Regulatory Commission. These regulations require that, to be disposed of, high-level waste must be a durable, stable solid. To meet this requirement, many high-level waste treatment technologies were evaluated. Vitrification was selected as the immobilization technology best suited to the majority of DOE high-level waste: the process equipment performs well in remote operation and the borosilicate glass product tolerates considerable variation in waste composition. Vitrification has also been approved by EPA as the best demonstrated available technology for disposal of this waste under RCRA. Vitrification plants are planned at the Savannah River Site and Hanford Site. The West Valley Demonstration Project, a joint program by DOE and the New York State Energy Research and Development Authority, will vitrify the high-level waste now stored at that site. Studies to identify a suitable treatment process and waste form for calcine and liquid wastes at INEL continue. Cumulative production will be about 21,000 canisters, each containing on average approximately two metric tons of waste form (volume of approximately one cubic meter).

The vitrification process selected for the DOE high-level waste treatment facilities at the Hanford Site, Savannah River Site, and West Valley Demonstration Project incorporates high-level waste into a borosilicate glass matrix, thus reducing the mobility of radioactive and other hazardous constituents. Waste and borosilicate glass-forming materials will be fed continuously as a slurry into a glass melter and heated to temperatures above 1000°C. After becoming molten and homogeneous, the melt will be poured into stainless steel canisters (Figure 2.1.3a). Sealed canisters will be cleaned and stored at each site pending transfer to a Federal repository for disposal.

DOE's vitrification facilities are in various stages of completion. At the Defense Waste Processing Facility at Savannah River Site, construction was completed in 1990 and nonradioactive testing is

Borosilicate Glass Process

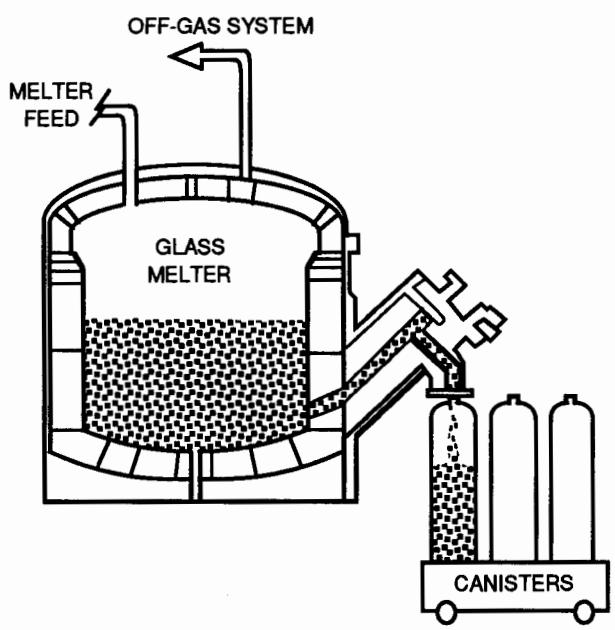


Figure 2.1.3a. Borosilicate glass, formed in a joule-heated melter and able to atomically bind high-level waste, will be poured into stainless steel canisters and stored pending disposal in a geologic repository.

being done. Radioactive operations are expected to start in 1994. At the West Valley Demonstration Project, construction will be completed in 1993; radioactive operation is scheduled for 1996. Preliminary site preparation work for the Hanford Waste Vitrification Project began in 1992. Plant design and construction of vitrification facilities to handle the INEL wastes will begin after selection of a final waste form and a manufacturing process.

It is not planned to vitrify all high-level waste tank contents. By pretreating the stored high-level waste, many nonradioactive substances can be separated from radioactive ones. The radioactivity will be concentrated into a small volume, and the high-activity fraction will be vitrified and disposed of in a geologic repository. The remaining large-volume, low-activity portion (decontaminated liquids that are now low-level waste) can be disposed of after immobilization in grout or cement (Figure 2.1.3b). Low-level waste treatment technologies are discussed in Section 2.1.5.

At the Savannah River Site and West Valley Demonstration Project, waste pretreatment is relatively easy because waste at those sites is from only a few processes and is well characterized. Pretreatment is more complex at the Hanford Site because many different processes have been used over the decades to separate particular nuclides, resulting in a wide variety of waste mixtures.

While waiting for pretreatment activities to begin, high-level waste in the tanks must be maintained in safe storage. At Hanford, DOE has begun a 15-month study to formulate a fully integrated Tank Waste Remediation System. This system will encompass all aspects of Hanford tank waste management: characterization, retrieval, pretreatment, and vitrification. Highest priority will be given to resolution of safety issues associated with safe storage of tank wastes. As agreed upon with the State of Washington Department of Ecology, pending the outcome of the 15-month study, DOE is continuing with all actions required to maintain the Hanford Waste Vitrification Project's December 1999 hot startup. Tank safety issues are discussed further in Section 2.1.3.1.

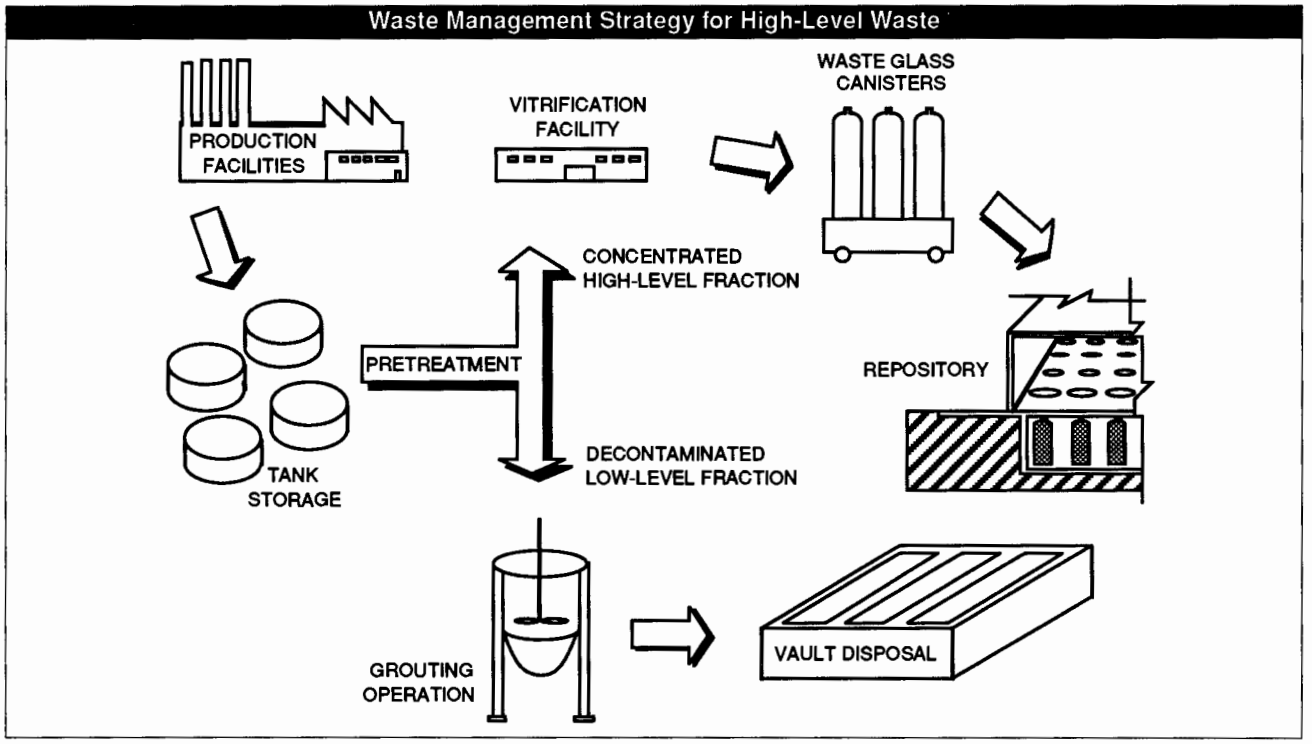


Figure 2.1.3b. Comprehensive waste management strategy for high-level waste leads to deep geologic disposal.

Spent Nuclear Fuel

Spent nuclear fuel from commercial nuclear utilities will be disposed of in a mined geologic repository. DOE traditionally has chemically processed its spent nuclear fuel to recover materials for defense purposes. Recently, DOE decided to discontinue reprocessing solely to recover valuable materials. DOE spent nuclear fuel is located primarily at the Hanford Site, INEL, and Savannah River.

Although in 1990 the total amount of DOE spent nuclear fuel was less than 5000 metric tons, there are about 100 distinct kinds of fuel. Consolidating similar fuels into the same class will reduce the number of identifiable groups that will require unique treatment to about 30 discrete classes, thus minimizing the technology development effort needed to find ways to properly prepare the spent nuclear fuel for repository disposal. Unlike commercial spent fuel, much of DOE's spent fuel will require further conditioning and packaging to meet disposal requirements.

A program has been established to investigate technologies for long-term storage and disposal of DOE spent nuclear fuel. The program will focus initially on spent nuclear fuel types now stored at INEL and later on types of spent fuel stored at other sites. The specific fuel types to be studied first at Idaho will be determined in early 1993. The first pilot-scale facility is expected to be ready about the turn of the century and the first production facility about a decade later.

2.1.3.1 TANK SAFETY

DOE is taking aggressive actions to ensure safe operation of its high-level waste tanks now and in the future.

Currently, approximately 381,000 cubic meters of high-level waste 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.

In 1990, DOE identified two high-priority safety issues associated with high-level waste tank storage at the Hanford Site: (1) accumulation and periodic release of significant quantities of flammable gases (hydrogen and nitrous oxide) in 23 tanks and (2) the potential for explosion of ferrocyanide (FeCN) compounds in 24 tanks. In response, DOE established a special task force in 1990 to identify and resolve safety issues and upgrade safety of all tank storage operations. The High-Level Waste Tank Task Force established a program to achieve these goals. The program, which is continually evolving as information becomes available, consists of several major components, including (1) evaluation and resolution of the flammable gases and FeCN issues, (2) identification and resolution of other safety issues and deficiencies, (3) upgrade of safety documentation and criteria and validation of the safety envelope within which high-level waste tank storage activities must operate, (4) upgrade of the conduct of tank operations, and (5) establishment of a workshop program to facilitate communications among all high-level waste sites, Headquarters, national laboratories, and other sources of expertise to achieve a standard of excellence among all high-level waste tank operations.

Because of the potential consequences of a hydrogen gas or ferrocyanide accident, DOE has made its highest priority evaluation and resolution of these two issues at Hanford (the other three high-level waste tank sites do not share these issues). Preliminary analyses of flammable gas reactions, potential accident initiation, and consequences and probabilities of occurrence have indicated that if a gas ignition were to occur, it might damage the tank but containment would likely be maintained. Tight administrative controls are in place to prevent potential ignition sources. Activities are in progress to determine the gas generation and retention mechanisms based on synthetic waste studies and modeling activities. Two full-depth waste core samples, obtained from Tank 101-SY (tank of greatest concern), are being analyzed to verify the synthetic waste study results and determine the need for additional studies. Twenty-three potential options for mitigating gas accumulation in Tank 101-SY have been evaluated. Dilution, mixing, heating, and ultrasonics (the preferred options) are being developed for evaluation and implementation on an accelerated schedule.

Analysis of the FeCN issue indicates that a FeCN/nitrate energy release is less severe and more unlikely than originally postulated. Preliminary evaluation of process flow sheets, synthetic waste studies, and thermodynamic analyses indicates that 20 of the 24 FeCN tanks probably pose a very low hazard because of the low concentrations of FeCN in the waste, coupled with significant moisture content and relatively cool temperatures. These preliminary conclusions must be verified through analyses of real waste samples. The remaining four tanks probably contain higher concentrations of FeCN and may pose a greater hazard if the moisture content is reduced or temperatures increase. Waste in these four tanks will be sampled first to better assess the potential magnitude of the hazard. Instrumentation will be installed in all FeCN tanks to monitor tank temperatures and verify that they are within safe operating limits. Addition of cooling water and treatment of wastes are being evaluated as potential mitigation options if further studies or tank monitoring indicate the need for mitigation.

During FY 1992, DOE systematically identified safety issues and deficiencies at each of the four high-level waste sites. Each site is now developing plans and programs to address the issues to ensure that high-level waste is stored safely until it can be treated for final disposal.

Review and upgrade of safety documentation is focusing on the safety analysis reports, which are forming the basis for establishing the "safety envelope" within which nuclear facilities must operate. A safety analysis report format and content guide, comprehensive review plan, and risk acceptance guidelines have been developed. Safety documentation will be systematically reviewed and upgraded using this guidance to ensure that it meets current DOE Orders and guidelines, and the safety envelope will be revised and validated.

Tank operations are being reviewed and upgraded to ensure that they are in compliance with the limiting conditions and operating procedures required by the safety analysis reports. DOE and site contractors are developing a Conduct of Operations Manual. Upon completion, the Conduct of Operations Manual will be disseminated to the sites for training and implementation; oversight criteria will be developed, and DOE will implement a comprehensive oversight program to ensure that all operations meet applicable standards and are bounded by the safety envelope.

The Tank Waste Remediation System was established in FY 1992 to provide an integrated approach to managing all aspects of high-level waste at Hanford. Enhancement of tank safety is a key aspect of this system. The basis for formulating the Tank Waste Remediation System is minimization of safety, health, and environmental risks, with reduction of safety risk being highest priority.

Objectives to be accomplished during the next five years include (1) elimination of accumulation and periodic venting of flammable gases; (2) determination and validation of the risks posed by FeCN compounds and reduction of risks to acceptable levels through monitoring and/or corrective actions, as necessary; (3) evaluation and implementation of programs to resolve other safety issues; (4) characterization of wastes in high-priority tanks; (5) upgrade of tank instrumentation; (6) review and upgrade of conduct of tank operations, including procedures, staffing, and training; (7) development of an integrated data base network; (8) continued implementation of the workshop program to upgrade all aspects of high-level waste tank operations; and (9) identification and evaluation of codes, standards, other requirements, and guidance applicable to high-level waste tank activities.

High-level waste tank safety activities are being conducted in close coordination with numerous internal and external oversight organizations, including the Office of Environment, Safety, and Health; the Office of Nuclear Safety; and the Defense Nuclear Facilities Safety Board.

2.1.4 TRANSURANIC WASTE

Sites are planning and implementing activities that support continued safe storage until a transuranic waste disposal facility is available.

Transuranic (TRU) waste is defined as waste contaminated with alpha-emitting radionuclides with an atomic number greater than 92 (heavier than uranium), half-lives greater than 20 years, and in concentrations greater than 100 nanocuries per gram of waste. The principal sources of TRU waste are research and development, plutonium recovery, weapons manufacturing, and decontamination and decommissioning. Currently, DOE manages approximately 251,400 cubic meters of TRU waste and five million curies of radioactivity. Of the 251,400 cubic meters of TRU waste, approximately 60,607 cubic meters has been generated since 1970. A long-range TRU waste management plan is being prepared during the next year.

All TRU waste generated since 1970 has been placed in long-term storage at six DOE sites. The waste is stored in retrievable form for eventual shipment and disposal at a permanent geologic repository. Figures 2.1.4a and 2.1.4b show the percentage by volume and by curie quantity of TRU waste that is in retrievable storage.

TRU waste is contained in a variety of packagings, including metal drums and wooden and metal boxes, and stored in earth-mounded berms, concrete culverts, or other type facilities. It is estimated that 72 percent of the drums have been in storage for more than ten years and 20 to 30 percent of the bermed drums contain corrosion pinholes or are badly deteriorated. Repackaging and relocating some retrieved waste will be required before shipment. Sites are planning additional storage capacity for retrieved and relocated waste pending repository availability.

All newly generated and retrieved TRU wastes must be characterized to determine their radiological and hazardous constituents. Characterization is essential to satisfy regulatory requirements and to certify that the waste intended for disposal meets the Waste Isolation Pilot Plant (WIPP) waste acceptance criteria. DOE is proceeding on the assumption that characterization requirements can be satisfied through a combination of process knowledge, statistical sampling, and physical and chemical analytical measurements. Regional and local characterization facilities must expand dramatically to support site operations and WIPP disposal phase decision and operations. To support this effort, a Transuranic Waste Characterization Plan is being developed.

Treatment of TRU mixed waste (radioactive and hazardous) might be required under RCRA to remove or reduce to acceptable levels the land disposal restriction constituents in the waste or under 40 CFR 191 (Disposal Standards) before shipment and disposal. The need to treat TRU waste is being assessed as part of the WIPP test phase.

Interim storage capacity must be sufficient to provide flexibility to respond to the site operations and activities for newly generated and stored TRU waste (e.g., retrieval, characterization, treatment, and relocation) and WIPP's availability. Each site's management responsibilities for interim storage facilities and operations are increasing dramatically in light of the delay and uncertainty in WIPP's availability.

TRU waste in interim storage at the Rocky Flats Plant (RFP) represents a special situation. Until recently, the Idaho National Engineering Laboratory served as the long-term storage location for waste from RFP and other TRU waste generators. In 1989, further plutonium processing at RFP 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 waste from other DOE sites for storage at the

Idaho National Engineering Laboratory. Rocky Flats has ceased production of weapons components and the generation of TRU waste has decreased significantly. DOE is evaluating the establishment of a commercially owned and operated storage site through a procurement activity. The Request for Proposal was issued January 1992, and proposals were received by March 3, 1992. An evaluation of proposals is under way. All TRU waste will be shipped in accordance with an integrated shipping plan that includes a comprehensive emergency response plan.

All sites are striving to maintain safe and regulatory-compliant storage of the TRU waste inventory. Some sites are increasing storage capacity for newly generated waste because of the delays in the WIPP schedule. The Hanford Site, Idaho National Engineering Laboratory, and Savannah River Site have major projects for characterization, retrieval, and repackaging of TRU waste. Generator sites are also participating in the development of a TRU waste management strategy, including contingency planning.

Construction of the Idaho facility began in December 1992. Hanford is proceeding with design of its facility with construction expected to begin in FY 1996. Savannah River is also in the design phase with construction expected to begin in FY 1994.

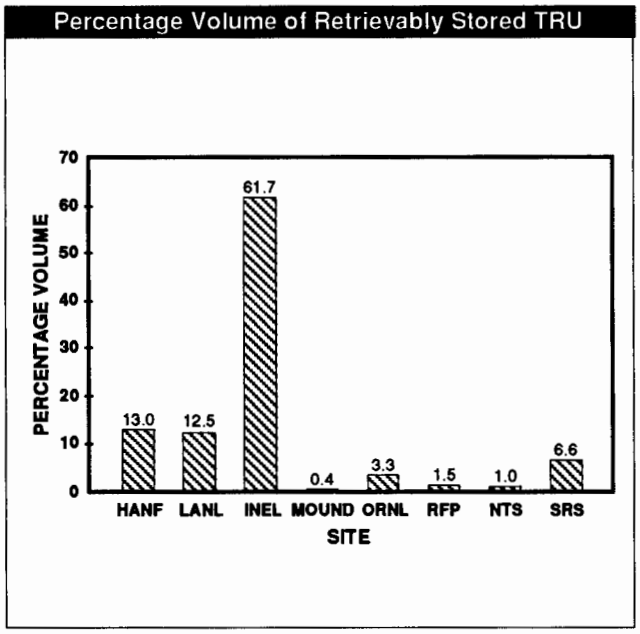


Figure 2.1.4a. Percentage volume of retrievably stored DOE TRU waste through 1990. Data for Figures 2.1.4a and 2.1.4b were taken from an integrated data base for 1991: U.S. Spent Fuel and Radioactive Waste Inventories, Projections and Characteristics, published Oct. 1991.

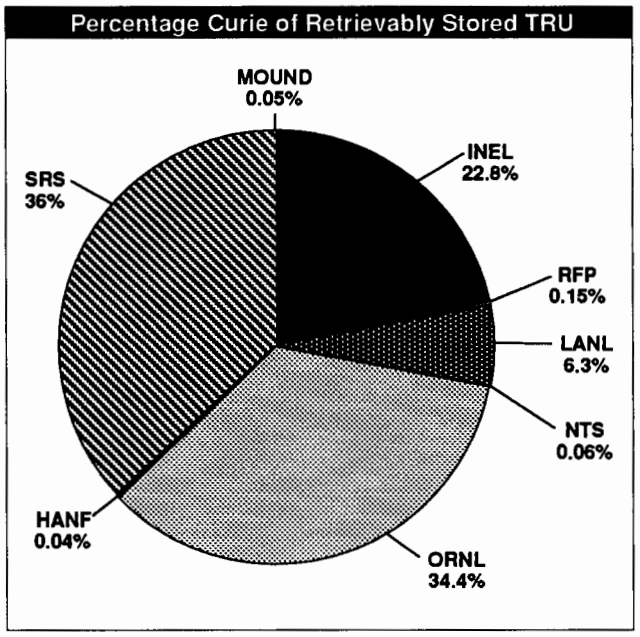


Figure 2.1.4b. Percentage curie quantity of retrievably stored DOE TRU waste through 1990.

2.1.4.1 WASTE ISOLATION PILOT PLANT

With the passage of the WIPP Land Withdrawal Act, the Waste Isolation Pilot Plant is ready to begin the Test Phase with transuranic (TRU) waste, pending completion of a number of prerequisites outlined in the Act.

The Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico, was constructed as a research and development facility to demonstrate safe disposal of retrievable, stored defense program waste in a geologic repository. To reduce uncertainty in the prediction of long-term repository performance, a multi-year Test Phase using a limited amount of radioactive waste is planned. If compliance with EPA regulations can be demonstrated, WIPP will be used for disposal of transuranic waste currently stored in Idaho, Colorado, Washington, South Carolina, Tennessee, and other States. Mined geologic disposal such as WIPP, as opposed to continued above ground storage, is expected to provide a much greater level of confidence for long-term environmental protection.

Since October 1991, DOE has been ready to ship waste to WIPP to initiate a series of tests needed to determine the Waste Isolation Pilot Plant's suitability as a geologic repository. After wide-ranging independent technical analyses and environmental and safety evaluations conducted in parallel with extensive public review, the Secretary made the decision on October 3, 1991, that WIPP was ready to begin a Test Phase, with a limited amount of TRU waste, in a manner that fully protects the safety of workers, the public, and the environment. However, TRU waste shipments to WIPP, starting with waste from INEL and Rocky Flats, were postponed due to lawsuits filed against the Department.

Since that time, the Department has maintained WIPP readiness to accept waste and worked diligently with Congress to obtain land withdrawal legislation. Subsequently, Congress passed, and the President signed into law on October 30, 1992, the WIPP Land Withdrawal Act (P.L. 102-579). In addition to withdrawing public lands surrounding the WIPP site, the Act prescribes about 140 separate requirements, of which about 80 percent are new requirements for DOE and other Federal agencies. It established a new regulatory framework involving regulatory oversight by the Environmental Protection Agency (EPA) and other Federal agencies. The Act requires DOE and other agencies to complete several new prerequisites for the start of the Test Phase. These prerequisites include the following:

- EPA issuance of final disposal regulations under 40 CFR 191.
- DOE submittal to EPA of Test Phase and Retrieval Plans.
- EPA approval by rule of Test Phase and Retrieval Plans.
- DOE issuance of safety analysis documentation to certify safety.
- EPA determination of compliance with the No Migration Determination.
- DOE issuance of a plan to ensure underground room stability.
- Concurrence by the Mine Safety and Health Administration (MSHA) in DOE's underground room stability plan.
- Certification by the Occupational Safety and Health Administration (OSHA) of DOE's emergency response training.

The Department plans to work diligently with the involved agencies to assure that all necessary approvals and certifications are in place prior to the first shipments of Test Phase waste. The earliest date that DOE can begin the first Test Phase shipments, assuming all of the above prerequisites are met within the statutory deadlines, is August 1993.

The Act also contains a number of other prerequisites for the disposal phase. A key prerequisite for the disposal phase is EPA certification of WIPP's compliance with disposal regulations. Other Disposal Phase prerequisites include:

- DOE submission to Congress plans for the decommissioning and post-decommissioning management of the land withdrawal.
- DOE acquisition of existing oil and gas leases unless EPA determines that such acquisition is not required.
- DOE submission to Congress comprehensive recommendations for the disposal of all TRU waste under the control of DOE, including a timetable for the disposal of such waste.
- DOE completion, with notice and opportunity for public comment, of a survey identifying all TRU waste types at all sites from which wastes are to be shipped to WIPP.
- A six-month waiting period from the date on which DOE notifies Congress that WIPP has met the requirements of all applicable environmental laws and regulations.

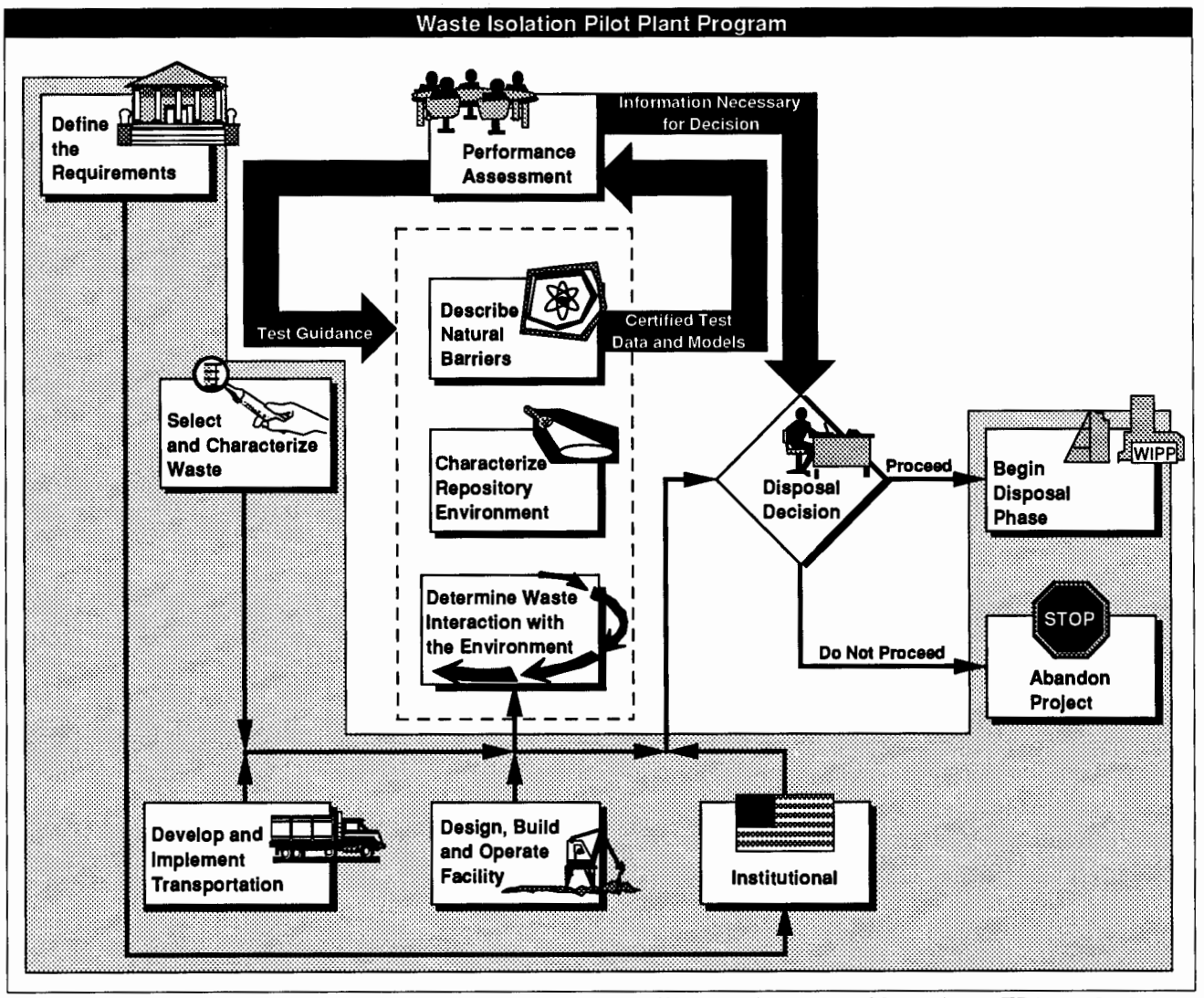


Figure 2.1.4.1. The objective of the WIPP test phase is to determine if WIPP will comply with applicable EPA standards for disposal.

Other major new legislative requirements contained in the Act include the following:

- EPA certification of DOE's compliance with disposal regulations every five years after its initial certification.
- EPA certifications of DOE's compliance with other applicable laws and regulations every two years during the Test Phase and thereafter.
- Periodic underground safety inspections by MSHA and the Bureau of Mines (BOM).
- Biennial performance assessment reports.
- National Institutes of Occupational Safety and Health (NIOSH) periodic reviews of emergency response training.

Implementation of P.L. 102-579 remains a top priority for DOE. Meanwhile, the WIPP site is maintaining readiness to receive initial waste shipments and is continuing program activities. Waste characterization and waste bin-loading activities continue at the Idaho National Engineering Laboratory, and preparations are underway to initiate bin-loading activities at the Rocky Flats Plant. Ongoing experiments are being conducted at the WIPP site, Sandia National Laboratories, and research centers (such as Pacific Northwest Laboratory, Brookhaven National Laboratory, Lawrence Berkeley Laboratory, and Florida State University) to obtain data on physical characteristics of the site and behavior of the waste. Safety, health, and environmental monitoring programs continue at the WIPP site and surrounding environs. Emergency response training for DOE, State, Tribal, and local emergency organizations is ongoing. Underground and surface facility operations are being conducted to maintain the facilities for waste receipt, such as completion of post-start actions resulting from findings by external review groups, preventive and corrective maintenance, training, security, and facility upgrades. Underground room stability enhancements in Room 1, Panel 1, of WIPP, where the first bin testing will occur, have been completed to ensure stability of the existing test rooms for the duration of the Test Phase.

In October 1991, DOE issued Revision 4 of the WIPP Waste Acceptance Criteria, which consolidates requirements and criteria from several WIPP documents, including operations and safety criteria, transportation/waste package requirements (from TRUPACT-11 Certificate of Compliance), Resource Conservation and Recovery Act/No Migration Determination requirements, and performance assessment criteria.

WIPP performance assessment activities continue at Sandia National Laboratories. Performance assessment includes the following activities:

- Modeling the disposal system based on available information.
- Identifying processes and events that might affect the system.
- Examining effects of processes and events on system performance.
- Estimating cumulative releases of radionuclides.

The nonradioactive and radioactive tests to be conducted during the WIPP Test Phase will serve to reduce uncertainties in the performance assessment models. The performance assessment process is conducted in iterative cycles, using increasingly more detailed data from tests to continue refining models and predictions with greater confidence. Sandia publishes annually a performance assessment report which contains a comparison of data obtained to date against EPA's radionuclide disposal standard in 40 CFR 191, Subpart B. The fourth annual performance assessment report will be published in early 1993.

DOE is proceeding with planning activities for conduct of the Test Phase with waste. The objective of this Test Phase is to determine whether WIPP will comply with EPA disposal standards under 40 CFR 191 and RCRA regulations. Nonradioactive tests, which include laboratory, modeling, and field studies in rock mechanics, sealing, and natural barriers, are already underway and will continue. Radioactive tests will include the following series of tests:

- Source Term Tests, to be conducted at Los Alamos National Laboratory starting in October 1994, will measure concentrations of radionuclides and hazardous constituents in brine.

- Bin Tests, to be conducted underground at WIPP, will provide information on gas generation rates to reduce uncertainties in existing gas generation models.
- Alcove Tests, to be conducted underground at WIPP in larger-scale rooms in a real repository environment, will collect data on volatile organic compounds and other gases released to reduce uncertainties from headspace sampling.

Another priority during the Test Phase is to develop long-term disposal seals for WIPP. These seals will isolate waste rooms, panels of rooms, and shafts within the Salado salt formation.

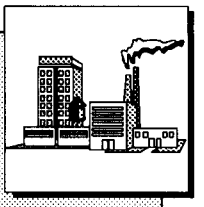
Several key planning documents are underway and nearing completion. In early 1993, DOE will issue its WIPP Strategic Plan, which is a top-level plan addressing the objectives, issues, and strategies for the Test Phase, Disposal Decision, Disposal Phase, and Decommissioning Phase. A Technical Needs Assessment Document was prepared in December 1992 and forwarded to EPA, the National Academy of Sciences, the New Mexico Environment Department, and the Environmental Evaluation Group. Based on this document, the WIPP Test Phase Plan is being revised for formal submission to EPA, along with the Waste Retrieval Plan. EPA must approve, through rulemaking, the Test Phase Plan and Retrieval Plan within ten months of the date of enactment of P.L. 109-579 (by August 30, 1992).

DOE will continue an active public education and community outreach program that emphasizes an open exchange of information about WIPP. DOE's activities include assisting public schools and universities in developing course curricula, providing course materials, and developing degree programs in the environmental sciences; a "shadowing" program that allows students to work closely with WIPP employees; dissemination of brochures, pamphlets, and fact sheets; a speaker's bureau that offers free information presentations on a variety of topics (including transportation, waste operations, environmental programs, experimental programs, and safety); tours of the WIPP site for visiting groups and community organizations; a visitors information center complete with exhibits and models; and an auditorium for presentations by engineers, scientists, and others on topics of interest.

Furthermore, DOE will continue to work with the State of New Mexico, as well as other transporation corridor States, the Western Governors' Association, the Southern States Energy Board, and affected Indian Tribal Nations to ensure DOE's continued readiness to respond to transportation emergencies. Through the States' Training and Education Programs, training will be provided to corridor States and local communities. Through the New Mexico Medical Working Group and Radiological Emergency Assistance Center Training Site, radiological emergency training is being provided to hospitals and medical staff in the corridor States and local communities. DOE will also continue to provide funding, as necessary, to ensure that all corridor States have the proper equipment available to detect radiation levels and to respond to radiological emergencies. Additionally, DOE plans to continue emergency response exercises along transportation routes to WIPP. A major demonstration of a simulated TRUPACT-II accident and the emergency response procedures was held in Idaho on the Fort Hall Indian Reservation in September 1992. The TRUPACT-II is a Nuclear Regulatory Commission certified container designed specifically for transuranic waste transportation.

DOE will maintain its cooperation with external review groups that provide independent reviews and recommendations on the WIPP test program and regulatory compliance activities. Such groups include the National Academy of Sciences Panel on WIPP, the Defense Nuclear Facilities Safety Board, and the Environmental Evaluation Group. In addition, DOE will continue to cooperate with regulatory agencies involved in the oversight of WIPP. These groups include the Environmental Protection Agency, the New Mexico Environment Department, the Mine Safety and Health Administration, Occupational Safety and Health Administration, National Institutes of Occupational Safety and Health, Bureau of Mines, and Bureau of Land Management.

2.1.5 LOW-LEVEL WASTE



Providing adequate waste treatment and disposal capacity is essential to managing DOE low-level waste.

Low-level waste includes all radioactive waste not classified as either high-level waste, transuranic waste, spent nuclear fuel or the bulk of the by-product tailings containing uranium or thorium from processed ore. It is DOE policy (DOE Order 5820.2A) that radioactive and mixed wastes shall be managed in a manner that assures protection of the health and safety of the public, DOE, and contractor employees, as well as the environment. The policy allows small volumes of uranium/thorium by-product material to be managed as low-level waste. The same DOE policy allows waste containing naturally occurring and accelerator-produced radioactive material to be managed as low-level waste. Any low-level waste that also contains hazardous chemicals covered by RCRA requires management as a "mixed" waste (mixed low-level waste is discussed in Section 2.1.7).

In developing the DOE long-range plan for managing low-level waste, EM is focusing on providing adequate treatment and disposal capacity. During the next five years, assessments of DOE low-level waste disposal facility performance will be complete. These performance assessments, required by DOE Order 5820.2A, will define treatment needs, disposal facility design, and waste that can be accepted for disposal. To improve efficiency, DOE is stressing waste minimization (Figure 2.1.5) and early characterization and segregation of waste to reduce generation of low-level waste requiring disposal. Improved characterization techniques and increased laboratory capacity are being pursued to help distinguish low-level waste from mixed waste. This distinction will ensure that only nonhazardous radioactive waste is disposed of in facilities intended for low-level waste. During the past ten years, approximately 100,000 cubic meters of low-level waste have had to be disposed of per year.

Improved treatment methods are being developed to reduce waste volumes requiring disposal and to provide stable waste forms. Reduced waste volume provides dual benefits of reducing the cost of disposal and extending the useful life of the disposal facility. Stable waste forms are critical because they constitute the basis for the performance of the disposal facility with regard to ensuring protection of public health and safety.

DOE low-level waste is generated at more than 30 different sites and is disposed of at six sites: Savannah River, Oak Ridge, Idaho National Engineering Laboratory, Nevada Test Site, Los Alamos National Laboratory, and Hanford. DOE will continue to dispose of most of its low-level waste at DOE sites. Alternative strategies to the current disposal practices, including use of commercial disposal facilities, are being considered. These alternatives will be evaluated as part of the Programmatic Environmental Impact Statement (see Section 1.6.1). Low-level waste roadmaps are being developed to identify and help resolve issues related to disposal objectives. One of the major efforts necessary in the next several years is estimating the amounts of low-level waste that will be generated by the Environmental Restoration Program and to plan for final disposition of this material.

State and local acceptance of low-level waste treatment and disposal technologies used or proposed by DOE is still lacking. This issue is difficult for DOE because many of its generator sites do not have on-site disposal capabilities. DOE will continue to work with States and the public (through the Stakeholders' Forum, State and Tribal Government Working Group, and the Programmatic Environmental Impact Statement process) to establish confidence that low-level waste will be disposed of in a safe and environmentally acceptable manner.

During the past year, progress was made on updating NEPA documents and the conceptual design report for new low-level waste below- and above-grade engineered disposal facilities on the Oak Ridge Reservation. Construction was completed on some vaults at the Savannah River Site Burial Ground Expansion. At the Nevada Test Site, waste acceptance criteria and waste certification processes were upgraded, and disposal resumed for three major generators.

During the next several years, construction on the new low-level waste disposal facilities at the Oak Ridge Reservation will occur with a planned FY 1999 startup. The Savannah River Site will complete construction and begin full operation of all vaults in the Burial Ground Expansion and will close the current shallow land burial trench. All 16 major generators that ship low-level waste to the Nevada Test Site will resume shipments after upgrading certification processes. At that time, the Nevada Test Site may become the largest burial ground in the DOE complex for defense-related, low-level waste. In the past, the Hanford Site and Nevada Test Site were called upon to dispose of limited amounts of DOE high-activity and special-case, low-level wastes in Greater Confinement Disposal. To retain this capability, these locations are in the process of evaluating the design and use of engineered disposal facilities for these wastes. An EIS for Greater Confinement Disposal is planned for the Nevada Test Site.

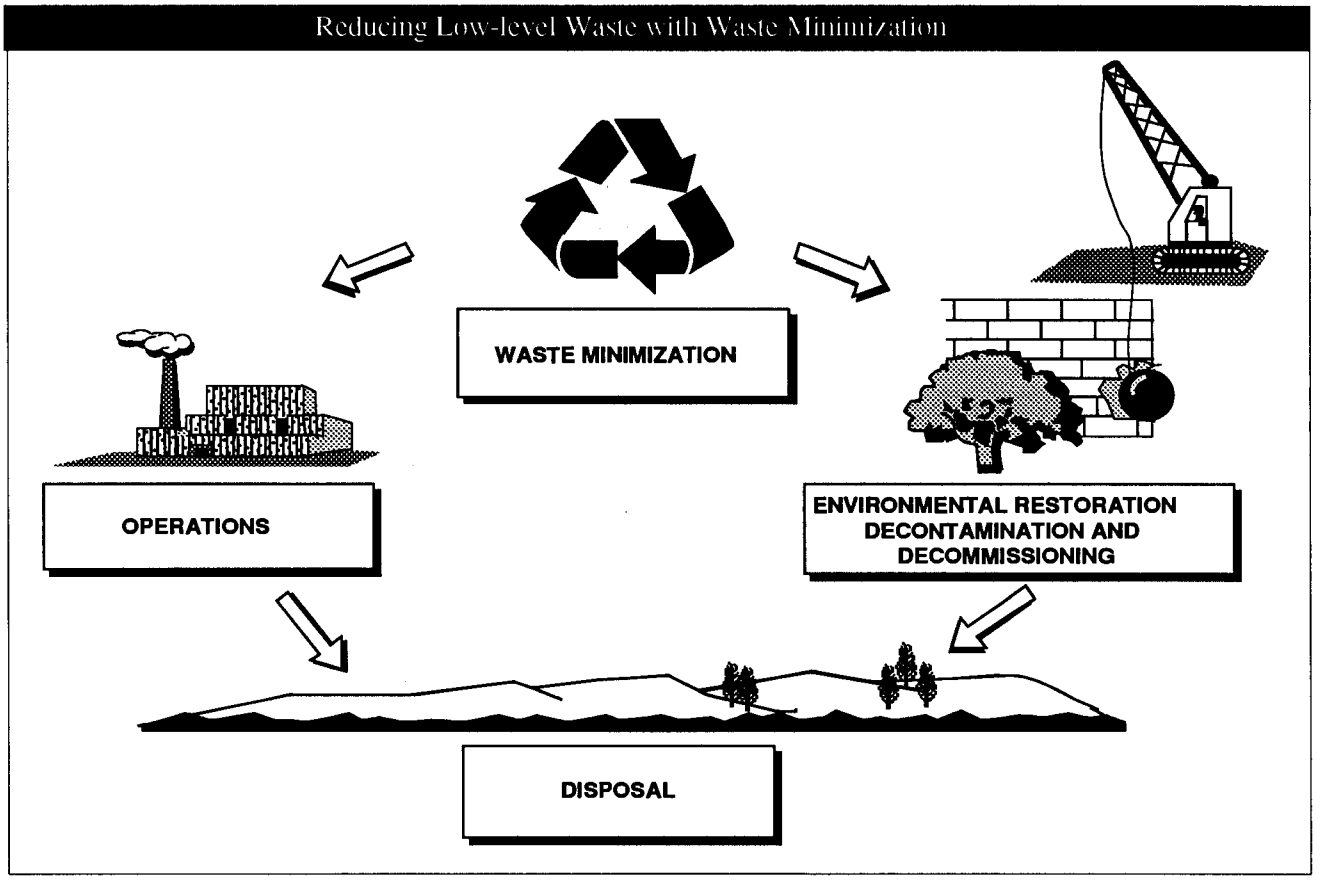


Figure 2.1.5. Waste minimization will significantly reduce the amount of low-level waste requiring disposal.

2.1.6 COMMERCIAL LOW-LEVEL RADIOACTIVE WASTE

DOE continues to provide technical and other assistance to States in their efforts to meet their responsibility under the law for commercial low-level waste and to implement the strategy developed for ultimate DOE disposal of Greater-Than-Class C low-level waste.

In 1980, P.L. 96-573, the Low-Level Radioactive Waste Policy Act, specifically assigned States the responsibility for providing for disposal of all low-level waste generated within their borders. This disposal will be regulated by the Nuclear Regulatory Commission and Agreement State licenses. In 1983, the Nuclear Regulatory Commission developed low-level waste disposal criteria and standards through Title 10 CFR Part 61, which categorized the waste into Classes A, B, and C based on concentration of radionuclides. Low-level waste exceeding the limits for Class C is identified as Greater-Than-Class C and is generally unacceptable for near-surface disposal.

The Low-Level Radioactive Waste Policy Amendments Act of 1985 (P.L. 99-240) further clarified States' responsibilities for the disposal of low-level waste, encouraged the formation of regional compacts, and established milestones with incentives and penalties regarding the timely development of disposal facilities (Figure 2.1.6a). This Act requires DOE to provide technical and financial assistance to the States and compact regions in developing low-level waste disposal capacity. This Act also requires DOE to ensure the safe disposal of Greater-Than-Class C waste.

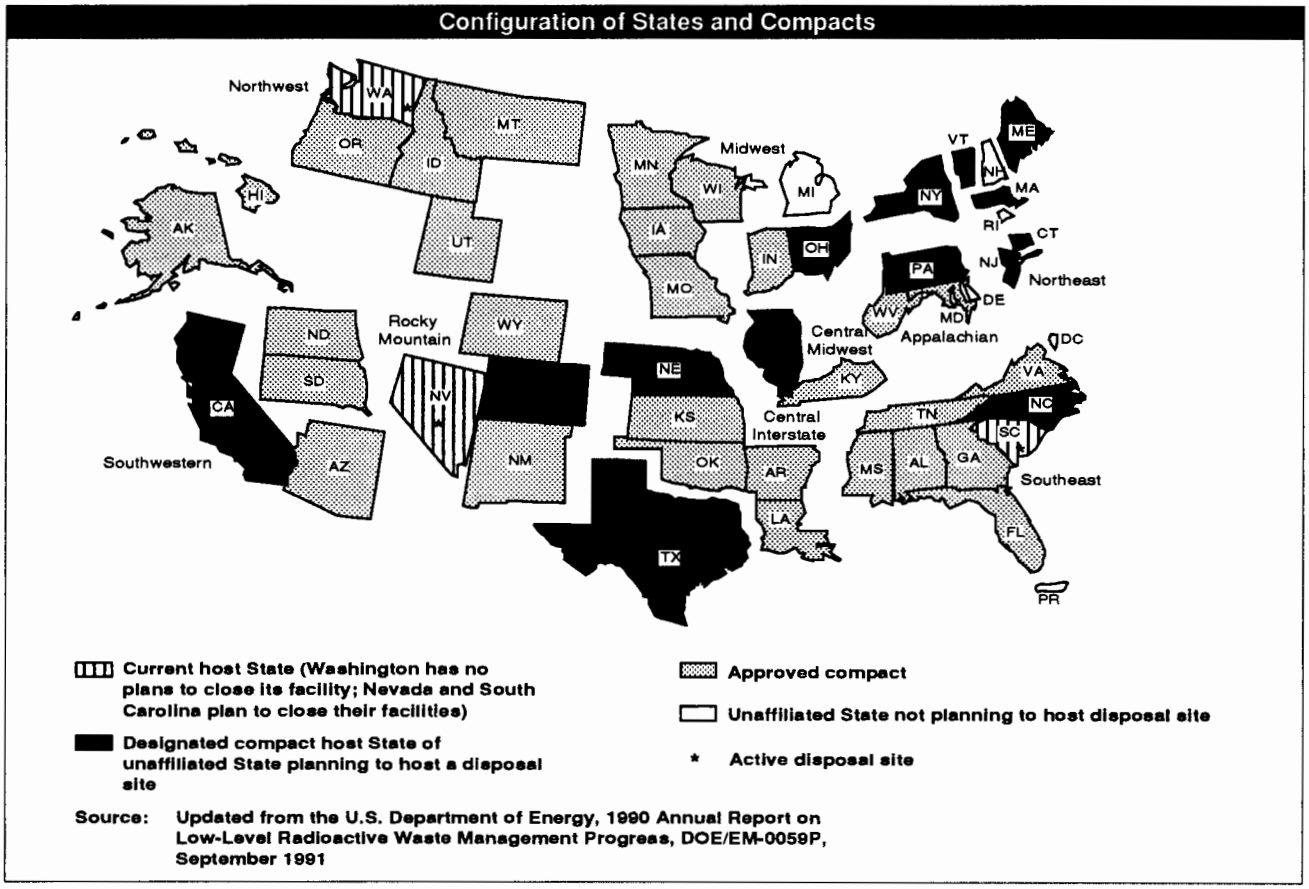


Figure 2.1.6a. Current configuration of States and low-level waste compacts.

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, maintaining program liaisons with key organizations, and providing direct technical support to States or compact regions regarding their individual needs. DOE maintains an extensive data base of information on low-level waste, including volume, radioactivity, State of origin, and disposal site. As required by P.L. 99-240, DOE administers the surcharge escrow account from which States, compact regions, or low-level waste generators may receive surcharge rebates if they successfully meet milestones established in the Act. In 1991, DOE completed draft procedures for returning rebates to the appropriate entity following the January 1, 1993, deadline specified in P.L. 99-240. DOE prepares annual reports, including the Surcharge Rebate Expenditure Report, the State-by-State Assessment of Low-Level Waste Received at Commercial Disposal Sites, and the Annual Report to Congress on Low-Level Waste Management Progress.

On January 10, 1992, the U.S. Supreme Court accepted for review New York's challenge to the constitutionality of the 1985 Act regarding the "take title" provision. The Act requires that States, "upon request of the generator or owner of the waste, shall take title to the waste, be obligated to take possession of the waste, and shall be liable for all damages directly or indirectly incurred by the generator . . ." as of January 1, 1996. New York alleged the Tenth Amendment provisions of State sovereignty were abridged. The Court heard oral arguments on March 30, 1992, and decided on June 19, 1992, that the "take title" provision was unconstitutional and was severable from the remainder of the legislation. The rest of the Act remains intact. States continue to be responsible for disposal of commercial low-level waste generated within their borders.

In response to the legislative requirement for DOE to dispose of low-level waste that is Greater-Than-Class C, DOE has developed a three-phase strategy (Figure 2.1.6b) to provide for

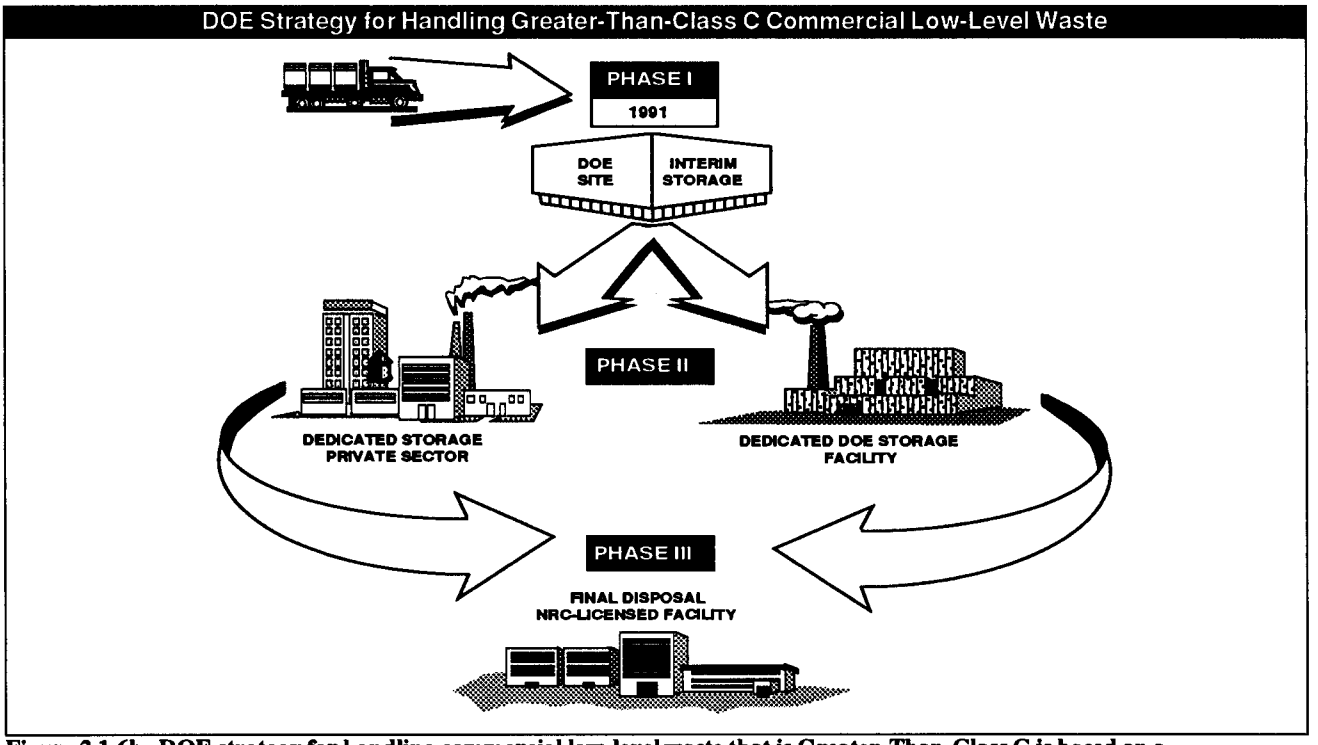


Figure 2.1.6b. DOE strategy for handling commercial low-level waste that is Greater-Than-Class C is based on a three-phased approach.

safe and effective management of commercially generated low-level waste exceeding the limits for Class C.

The first phase of the program strategy is to provide for interim storage of limited amounts of low-level waste classified as Greater-Than-Class C that pose a potential threat to public health or safety. In 1990, existing DOE facilities were reviewed to determine interim storage capability. In FY 1992, environmental documentation began in order to complete the selection of a specific DOE facility for interim storage of Greater-Than-Class C sealed sources.

The second phase of the program provides for a centralized, dedicated storage facility for all such commercial low-level waste until a Nuclear Regulatory Commission-licensed disposal facility becomes available. During this phase, DOE will consider privatization 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 Greater-Than-Class C waste, either in conjunction with a high-level waste repository or in a separate disposal facility for this type of waste. During 1993, an initial analysis of disposal options will be completed, although final disposal is not expected for many years.

2.1.7 MIXED LOW-LEVEL WASTE

Increased capacity and improved technologies are needed so that mixed wastes may be treated and disposed of in accordance with EPA regulations and DOE requirements.

Mixed wastes are radioactive wastes that are also contaminated with hazardous wastes regulated under RCRA. A significant portion of DOE mixed waste, including hazardous and radioactive soil in the DOE inventory, is mixed low-level waste. Compliance with the requirements for managing mixed wastes is one of the most significant issues facing DOE today.

In accordance with RCRA, EPA promulgates regulations for hazardous wastes. Implementation of hazardous waste regulations is the responsibility of EPA and authorized States. All mixed wastes are subject to RCRA hazardous waste regulations, which include requirements for treatment of waste before land disposal. Specifically, the RCRA Land Disposal Restriction regulations (40 CFR 268) require that wastes be treated to meet specific standards before they are placed in a land disposal unit that complies with the standard technical requirements for land disposal. If migration from a land disposal unit can be demonstrated not to occur for as long as the waste remains hazardous, then wastes can be disposed of without prior treatment. DOE plans to comply with RCRA standards before disposing of mixed low-level waste.

In 1990, DOE generated about 22,000 cubic meters of mixed wastes. In addition, DOE also has an inventory of 107,000 cubic meters of mixed wastes from past operations. These wastes will need to meet Land Disposal Restriction standards. DOE is currently operating and will continue to operate facilities providing for treatment of certain mixed wastes. These facilities include dilute effluent treatment plants, the grout treatment facility for solidifying low-level tank wastes at Hanford, and the Toxic Substances Control Act Incinerator at the Oak Ridge K-25 Site. Another incinerator at the Idaho National Engineering Laboratory is planned to restart in first quarter of the 1993 calendar year.

DOE is evaluating future capabilities needed for treating mixed waste. To fully meet treatment needs, technologies must be developed for some waste streams, and in other cases, the capacity of proven technologies will have to be increased (Figure 2.1.7). Facilities that will add to the current treatment capabilities, such as the Consolidated Incinerator Facility at the Savannah River Site, are currently in stages of design and 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 on-site versus off-site 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 wastes are generated. The use of commercial facilities will also be evaluated. These concept studies, cost-benefit analyses, and the outcome of the EM Programmatic Environmental Impact Statement will assist in determining the location and design of future treatment facilities.

Planning is under way for a prototype treatment facility for mixed low-level waste. Process and treatment technologies will be evaluated with respect to regulatory and waste management requirements. DOE will also begin to apply for RCRA permits for mixed low-level waste disposal facilities at Savannah River, Richland, Nevada, and Idaho.

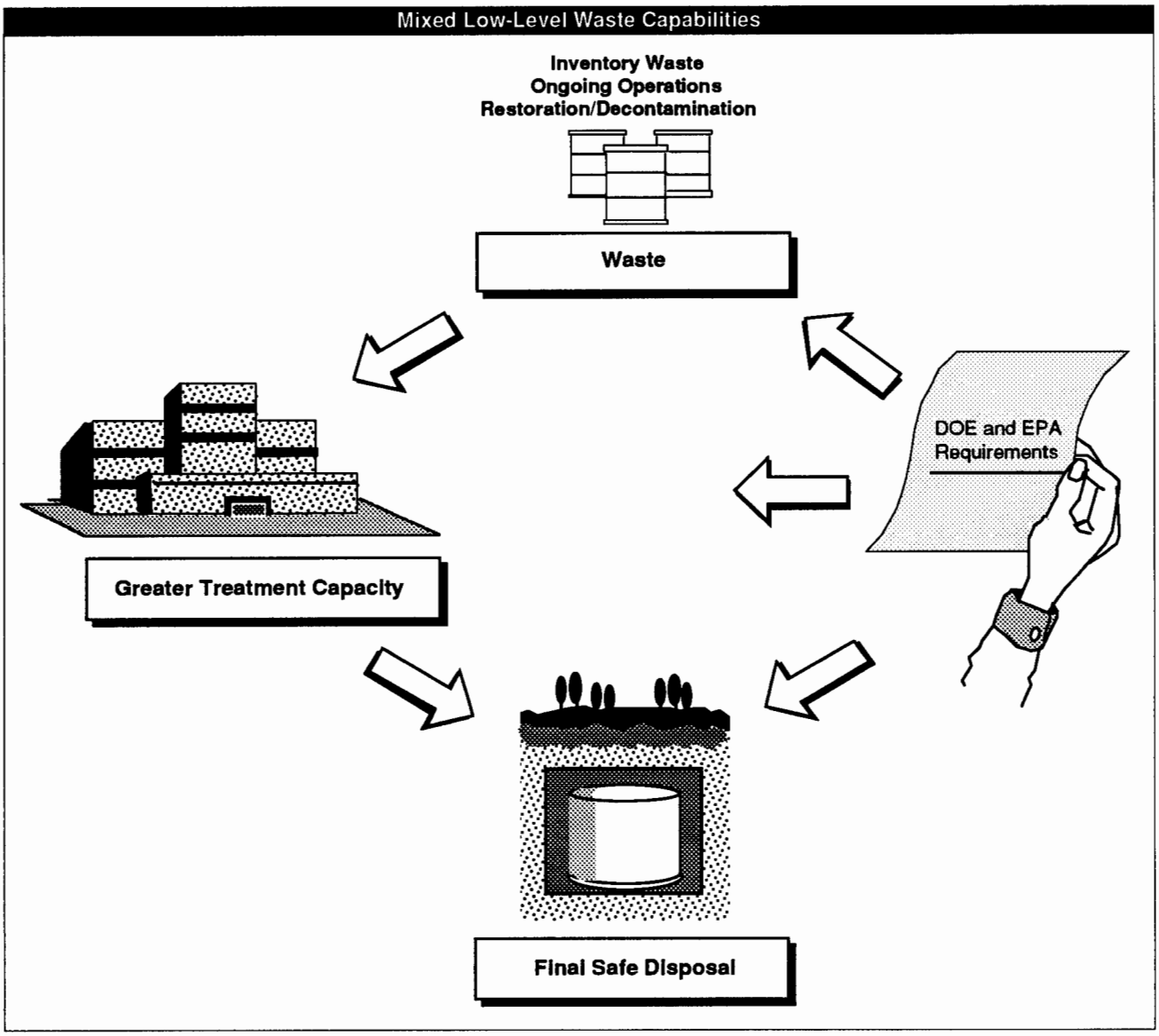
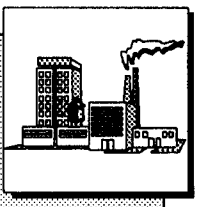


Figure 2.1.7. Enhanced capabilities will allow DOE to meet its growing mixed waste treatment needs.

2.1.8 HAZARDOUS WASTE



The Hazardous Waste Program emphasizes improving DOE's capability to minimize, characterize, package, and dispose of hazardous waste.

The Hazardous Waste Program addresses materials identified as hazardous or requiring regulatory control as stipulated by RCRA and the Toxic Substances Control Act. For example, materials such as trichloromethane, polychlorinated biphenyls, mercury, and cadmium are classified as hazardous waste. As stated in Section 2.1.7, the Land Disposal Restriction regulation (40 CFR 268) under RCRA requires treatment of the hazardous constituent of wastes to specific concentration levels before disposal. These regulations are implemented by the States or EPA regions and are applied to local DOE operations. The number of waste types banned from land disposal without appropriate treatment has steadily increased over the past five years. Similarly, waste management facilities must meet stringent waste acceptance criteria. The Hazardous Waste Program is designed to comply with these regulatory requirements, reduce risk to human health and the environment, and minimize waste generation. A long-range plan for managing hazardous waste is being prepared during the next year.

Minimize or Avoid Hazardous Waste Generation

The best waste management approach is to minimize and/or eliminate hazardous waste generation. EM's ongoing activities, discussed in Section 2.1.1, have minimization/elimination of hazardous wastes as their goal.

Proper Characterization of Waste

Waste characterization is crucial to the day-to-day operation of any waste management facility. Proper characterization of waste to determine hazardous constituents is needed to ensure that proper treatment and disposal methods can be applied to manage the waste.

DOE uses commercial hazardous waste management vendors to manage DOE-generated hazardous wastes. These vendors are not licensed by the Nuclear Regulatory Commission and, thus, can only accept hazardous wastes. A Federally established de minimis level of radioactivity has not been established and has resulted in the use of inconsistent methods for release decisions by DOE sites. As a result, a moratorium imposed by DOE prohibits shipping hazardous wastes to commercial waste management facilities until the procedures for determination of the potential radioactive component of that waste are approved by DOE. The moratorium is imposed to ensure that hazardous wastes shipped off-site from DOE sites are not mixed with radioactive constituents (or so-called mixed waste). DOE is in process of reviewing off-site release procedures for all DOE sites. Current policy only allows hazardous waste to be shipped to commercial hazardous waste management facilities if "no added" radioactivity as a result of DOE operations can be demonstrated (Figure 2.1.8).

Proper Treatment and Disposal of Hazardous Waste

A near-term DOE objective is to properly characterize, treat, and dispose of hazardous waste as it is generated, thus avoiding the need for additional storage capacity. This arrangement involves the use of permitted commercial waste management facilities for treatment and disposal of DOE-generated hazardous wastes. Between 1984 and 1991, DOE shipped an estimated average of 13 million kilograms per year of hazardous waste to off-site commercial waste management facilities.

As treatment and waste minimization efforts increase, the volume of waste disposed of should steadily diminish. The need for storage, however, will continue to rise to a peak, then diminish steadily as advanced programs are implemented for minimization and treatment. Currently, the Hazardous Waste Program has limited capability to quantitatively measure the results of its waste minimization efforts. However, the current effort to establish a waste management data base will enable accomplishments to be measured.

In the past year, DOE made progress on a wide range of hazardous waste issues. Several sites report upgrades and new construction of hazardous storage facilities to meet RCRA requirements.

The Hazardous Waste Program will also continue to improve DOE's capability to properly characterize, package, and minimize hazardous waste generation.

Specific activities that will improve hazardous waste management include

- improving off-site waste release procedures to ensure that only wastes properly determined as hazardous are shipped off-site to waste management facilities,
- investigating establishing DOE-wide uniform waste characterization procedures to ensure that consistent and proper waste characterization is being performed, and
- investigating the feasibility of establishing a DOE-wide Hazardous Materials Exchange Program. Once established, this program will reduce the amount of hazardous waste to be managed by donating reusable materials to potential users. This exchange program may also reduce the need for additional storage areas as well as treatment and disposal costs. This Feasibility Study will be completed by FY 1993.

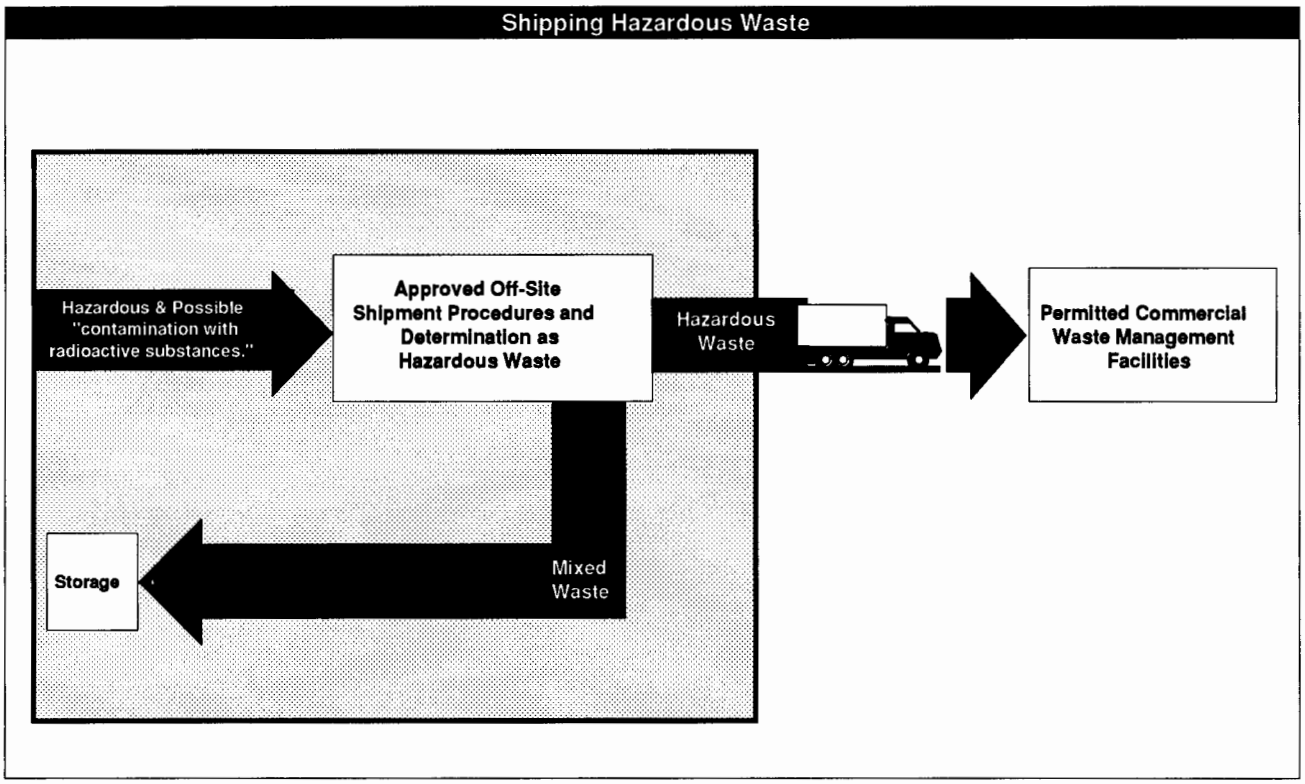


Figure 2.1.8. Currently, a moratorium imposed by DOE prohibits shipping hazardous wastes to commercial waste management facilities until the procedures for determination of the potential radioactive components are approved by EM. The current DOE policy only allows hazardous waste to be shipped to commercial hazardous waste managment facilities if "no added" radioactivity from DOE operations can be demonstrated.

2.1.9 SANITARY WASTE

Many existing DOE sanitary waste management facilities are aging and require upgrading to continue effective management of sanitary waste.

There are essentially two types of sanitary wastes: (1) solid sanitary waste and (2) liquid sanitary waste. The sanitary waste category includes materials that are not hazardous or radioactive.

Solid sanitary waste is routinely generated by normal housekeeping or construction activities (i.e., garbage or rubble usually disposed of in sanitary landfills). The operation and management of solid sanitary waste are regulated under the provisions of RCRA, Subtitle D (Figure 2.1.9). Solid sanitary waste is disposed of in on-site sanitary landfills that are owned and operated by DOE or shipped off-site to municipal landfills for disposal. EM is responsible for the operation of DOE-owned landfills.

Liquid sanitary waste includes sewage wastewater and industrial wastewater. Liquid sanitary waste may undergo a wastewater treatment process before discharge to a publicly owned treatment works or surface waters. Wastewater treatment processes may include a neutralization of acidic or basic wastewater or flocculation/clarification. The management of liquid sanitary waste is regulated by the Clean Water Act and the National Pollutant Discharge Elimination System.

Treatment of industrial and sewage wastewater is usually accomplished at on-site treatment facilities or by agreement at municipally owned facilities. Industrial wastewater undergoes pretreatment and treatment processes before being discharged.

Recent progress and plans for the future include the following:

- Idaho National Engineering Laboratory will begin construction of a Sanitary Waste Transfer Station that will permit the disposal of Idaho National Engineering Laboratory sanitary waste in a local municipal landfill. This activity will provide the interface between the Idaho National Engineering Laboratory and the local county for the disposal of sanitary solid waste and will be in compliance with RCRA, Subtitle D.
- Argonne National Laboratory–East completed preliminary design on a laboratory wastewater treatment plant. Also, Argonne National Laboratory–East completed the final design for laboratory and sanitary sewer collection system rehabilitation.
- The Oak Ridge K-25 Site has begun upgrading site sanitary and other wastewater collection systems to eliminate National Pollutant Discharge Elimination System noncompliance.
- The Nevada Test Site has completed the upgrade of several sewage lagoons to meet State and Federal clean water regulations.
- Los Alamos National Laboratory is continuing construction on Sanitary Wastewater System Consolidation.

Currently, the management of liquid sanitary waste is the responsibility of the DOE Program Office that is assigned landlord responsibility at each particular site. EM is responsible for monitoring DOE liquid sanitary waste management activities to ensure that such operations meet regulatory requirements. EM is currently working with the landlord Program Offices to evaluate benefits of assuming the responsibility for the construction and operation of all sanitary sewage systems at locations where it does not already bear that responsibility as landlord. EM is also developing a strategic plan for managing DOE sanitary waste. Once developed, the plan will provide EM with goals, objectives, and a comprehensive strategy for improved management of sanitary waste.

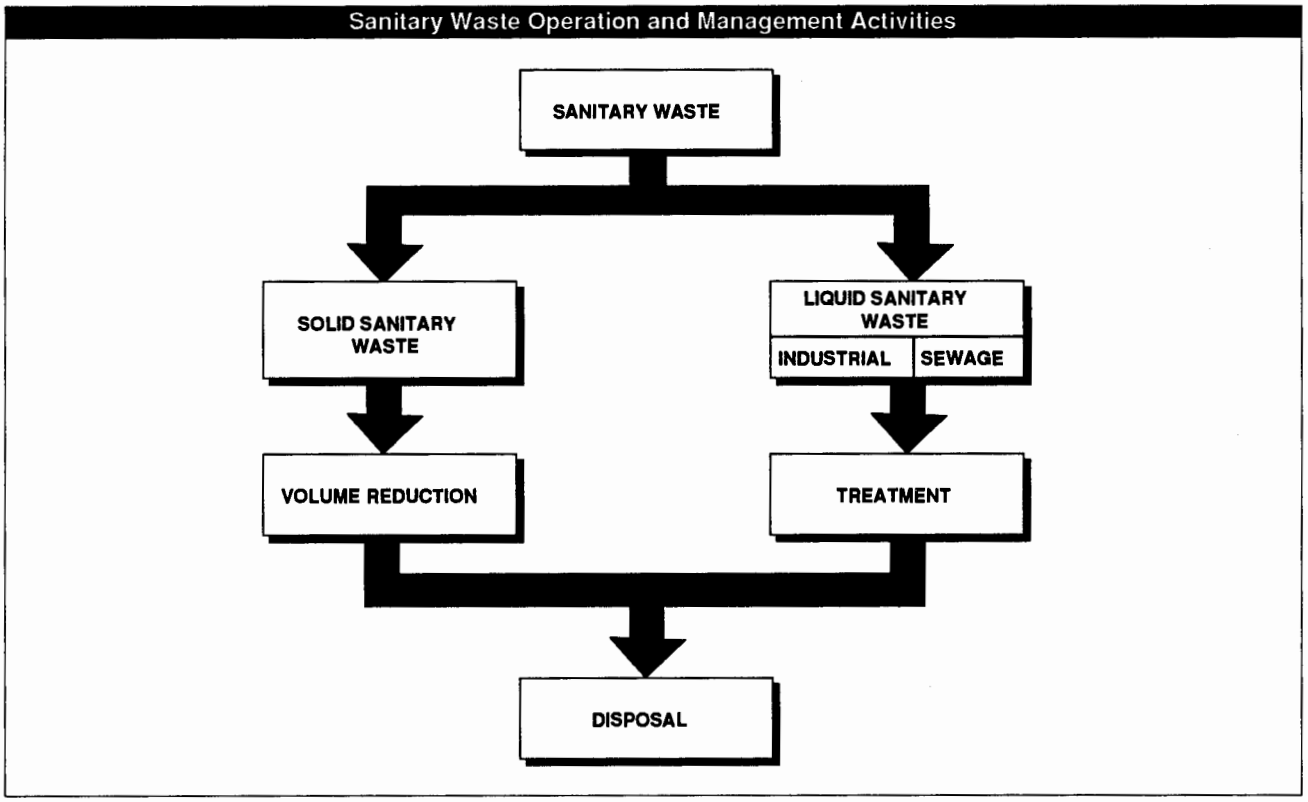


Figure 2.1.9. Sanitary waste in DOE is handled much like waste from any municipality and under the same regulations. EM will ensure that DOE sanitary waste operation and management activities will be performed to comply with regulatory requirements.

2.1.10 PROGRAM MANAGEMENT: SYSTEMS AND TOOLS

Program and project management systems and tools will enhance the management of the Waste Management Program.

DOE must develop and implement management systems and tools that will enable managers to effectively control the Waste Management Program. The rapid growth of Waste Management Program activities and funding has made these tools particularly important. The tools include refined cost-estimating guidelines; scope, schedule, and cost baselines; baseline change control; computerized progress tracking and performance measurement; and development of a resource allocation support system.

Baseline Development

As a result of lessons learned from the independent cost reviews of FY 1993–1997 Activity Data Sheets, cost and schedule estimating guidance for waste management baselines has been prepared for use in developing baselines for all Waste Management Program activities. Traceable and defensible cost estimates are a prerequisite to overall program success. Cost estimates and schedules, when prepared in accordance with the guidance, will provide the needed documentation to permit independent cost and schedule validation, facilitate program management change control activities, and provide for traceability and accountability.

Currently, complete baselines that include scope, schedule, and cost components exist for construction projects, including Major System Acquisitions and Major Projects. The goal is to have all waste management activities, including operations, baselined with scope, schedule, and cost elements for FY 1993. These baselines will provide the approved yardsticks against which progress and performance are measured.

Once baselines are developed, changes to the baselines must be controlled to ensure the integrity of the yardsticks. A formal change control process has been developed for projects to ensure that proposed changes to individual baselines are (1) approved by all cognizant managers and (2) reflected in other baselined activities that might depend on the modified activity. The process will be extended to other activities in the future.

Progress Tracking System and Work Breakdown Structure

The establishment of controlled baselines will enable progress and performance to be measured and reported for all activities. A computerized Progress Tracking System has been developed that will provide monthly information on (1) planned expenditures and milestones and (2) actual expenditures and milestone completion dates. This information will aid the program in identifying cost overruns/underruns and schedule slippages and initiating corrective actions in a timely manner. The Progress Tracking System will operate throughout EM to provide the detailed reports described above for program managers, generate summary reports for senior EM and DOE management, and respond to inquiries from external parties (Figure 2.1.10).

An important prerequisite to the development of baselines and reporting tools is the development of a work breakdown structure for the Waste Management Program. The new work breakdown structure, when implemented (scheduled for FY 1993), will provide a systematic structure for the flowdown of managerial direction and upflow of required reporting throughout the Waste Management Program. This work breakdown structure will aid in simplifying and clarifying the flow of information between Headquarters and field activities and result in more effective management control.

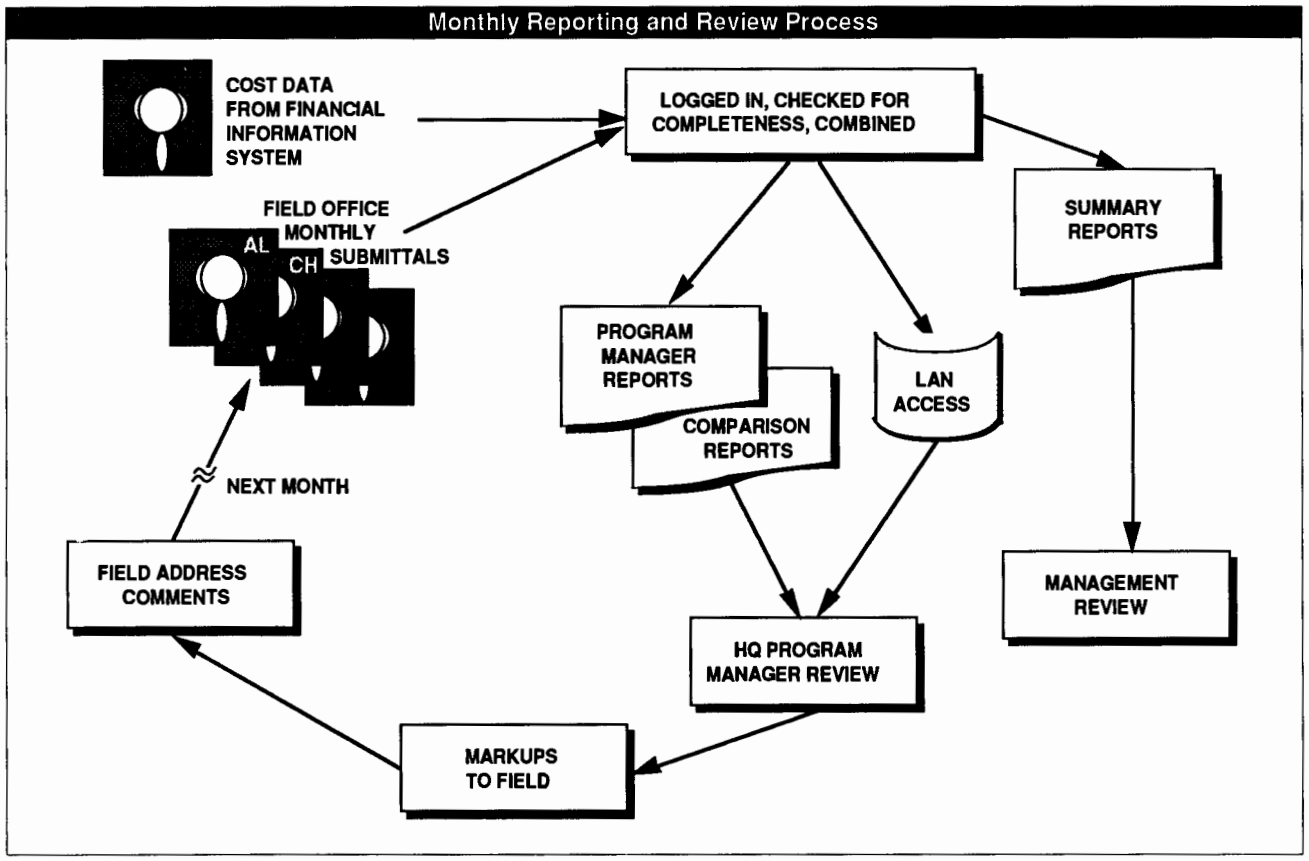


Figure 2.1.10. The Progress Tracking System will provide managers with monthly reporting of project status and expenditures.

Other Initiatives

Resource Allocation Support System

In addition to the tools mentioned above, the Waste Management Program is developing a Resource Allocation Support System to aid in the budget decision-making process. This system will provide managers insight on how well proposed work activities accomplish Waste Management Program objectives.

This system, still in the conceptual stages, was the subject of a pilot study in the summer of 1992. The results are being analyzed and should provide useful data concerning the utility and feasibility of the Resource Allocation Support System as a budget analysis tool.

Value Engineering in Risk Management

Waste Management has established a value engineering program in accordance with DOE Order 4010.1. Value engineering is an organized effort to use trained engineering personnel to analyze functions of systems, equipment, facilities, services and supplies to achieve the essential functions at the lowest life cycle cost consistent with required performance, reliability, quality and safety. Value engineering is accomplished with organized interdisciplinary teams employing approved problem-solving techniques to provide quality product or service at the lowest possible cost.

Waste-Type Planning

The Waste Management Program is enhancing its planning process by adding Site and Waste-Type Strategic Long-Range Plans and roadmaps to the hierarchy of planning documents to ensure that a comprehensive, integrated planning process exists. These planning tools will provide a clearer picture on the progress of high-level, transuranic, low-level, mixed, hazardous, and sanitary waste management across the DOE nuclear facilities on a program-wide basis. They will also aid in identifying issues and obstacles to achieving program objectives. Finally, it is expected that these plans will identify potential resource savings associated with more efficient use of individual facilities across the DOE complex and elimination of potential duplicative efforts.

All of the improvements in existing management systems are being developed in accordance with the new management policies and requirements to be completed for the Waste Management Program. These policies and requirements, further defined through management plans and standard operating practices and procedures, provide the basic framework into which specific management initiatives and tools must fit. This approach will ensure that the individual tools work together effectively.

2.1.11 ISSUES AND STRATEGIES

The Waste Management Program faces significant obstacles to its success, and strategies are being pursued to eliminate or mitigate their impacts.

The Waste Management Program is taking a systems approach to identifying issues and developing strategies to overcome those issues. This systems approach involves the collection of information regarding the characteristics of each waste type that influence treatment, storage, and disposal. It also involves development of a series of analyses that will generate documents in support of the strategic decisions of the Waste Management Program. These documents include the Strategic Plan for Environmental Restoration and Waste Management (Appendix C); the EM site roadmaps; and the EM Programmatic Environmental Impact Statement (PEIS), which includes the EM Configuration Study and reflects the Defense Programs Reconfiguration Study.

Data Needs

The FY 1994–1998 Five-Year Plan discusses the variety of waste types for which the Waste Management Program is responsible. A major challenge for effective management of these wastes is the need for detailed information on the quantities and characteristics of wastes currently being managed or projected to be generated during the next several decades. These data are required for developing a facilities siting strategy, assessing the availability of acceptable technologies, and identifying capacity requirements, scope, and schedules for future treatment, storage, and disposal facilities. Estimates of future wastes resulting from environmental remediation, weapons complex reconfiguration, and weapons dismantlement are needed.

To address this need, the Waste Management Program is involved in continuing efforts to obtain this information and to develop long-range plans for each waste type in the DOE complex. Supporting analyses include identification of waste management options. This will help identify the unique requirements of different waste at different phases of the waste management process and shared characteristics that may be addressed by similar solutions.

Complex Reconfiguration

Reconfiguration of the nuclear weapons complex creates enormous uncertainties for the Waste Management Program. Recent dramatic changes in East-West relations and increased concern regarding the Federal deficit have prompted both defense budget cuts and the redirection of defense establishment resources. These changes will have a significant impact on both the scope and the nature of Waste Management Program activities. As the DOE complex changes in response to the defense program's reconfiguration, the responsibilities of the Waste Management Program are expected to increase. Consequently, the Waste Management Program will work closely with the Office of Defense Programs during this transition. This coordination will ensure that adequate resources will be made available to address the waste-related impacts of downsizing the weapons complex. Coordination will also be required to identify options and research and development needs for managing spent fuel and weapons materials that are surplus to defense requirements.

Because the exact nature of the weapons complex reconfiguration is still uncertain, pending the Record

of Decision on the Defense Programs Complex 21 Reconfiguration Study Programmatic Environmental Impact Statement, increased emphasis is placed on strategic planning and the development of contingency plans to provide the flexibility needed to address the uncertainties produced by future changes.

The siting of treatment, storage, and disposal facilities for radioactive and mixed waste is highly controversial. In many cases, competing objectives exist and an approach for making appropriate tradeoffs that are acceptable to the relevant stakeholders must be developed. Examples of such tradeoffs include the sharing of risk among generations and geographic areas; transportation versus land use impacts; and benefits in the use of new technologies. EM believes that the optimum siting strategy would result in minimizing overall risk from waste management activities across the complex.

A range of options for configuration of the waste management complex is being assessed using the limited data currently available. As the data becomes more complete, more sophisticated system analyses will be performed to optimize facility capacity and siting for each major DOE waste type (Figure 2.1.11a).

Programmatic Environmental Impact Statement

The EM Programmatic Environmental Impact Statement is being developed in part to compare the risks and environmental impacts of facilities siting alternatives. The main impacts currently planned to be analyzed in the Programmatic Environmental Impact Statement are those resulting from waste generation, siting, and transportation. The alternatives are therefore defined in terms of siting treatment, storage, and disposal facilities for the waste management complex.

EM has established and is committed to a policy of open and frequent information exchange with the public. In addition to the 1992 interactive pubic workshops conducted for the Programmatic Environmental Impact Statement Draft Implementation Plan, DOE has established a Federal Advisory Committee in response to public comments received at the Public Scoping Meetings. The Federal Advisory Committee will consider the scope, planning, and process of the Programmatic Environmental Impact Statement as well as the difficult problem of public resistance to facility siting. With external participation in these efforts, DOE will improve its capability to address public concerns with facility siting and waste shipments.

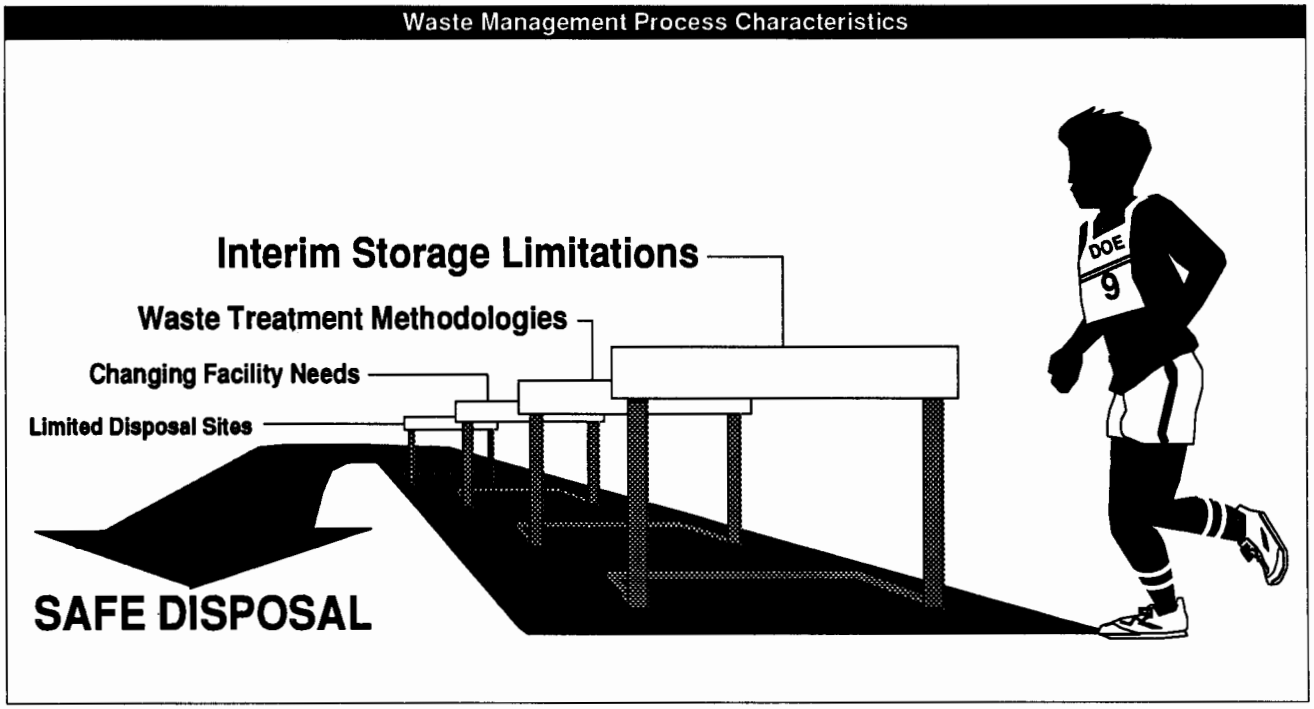


Figure 2.1.11a.

Other Issues

The Waste Management Program can learn many lessons from the experiences of DOE and others in dealing with siting and public acceptance issues. Expanded efforts are being made in education, public outreach, and open decision making related to waste management and disposal. In addition, alternative approaches such as use of the private sector to site, permit, and operate facilities and the solicitation of volunteer hosts for siting certain facilities are being considered. Anticipatory planning and improving DOE credibility should also help surmount siting obstacles.

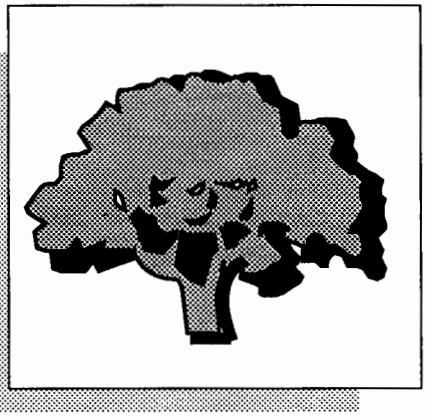
The environmental regulations that now apply to a significant portion of DOE's waste streams, which contain radioactive as well as hazardous constituents, were not specifically designed for the types of mixed wastes that DOE must manage. Consequently, these requirements have the potential to greatly increase overall program costs without any reductions in risk or improvements in safety. The existence of regulatory uncertainty and conflict in this area presents an added burden.

The Waste Management Program is expanding its efforts to identify the hazards associated with the wide range of waste streams to identify management requirements based on health risk analysis. The program is working closely with Federal and State regulators to incorporate this risk-based approach as a means of reducing conflicting requirements and maximizing the availability of sufficient resources to ensure public health, worker safety, and protection of the environment. Finally, the Waste Management Program supports a greatly expanded DOE-wide effort to incorporate waste minimization goals in all future activities. Figure 2.1.11b lists major issues and strategies for addressing them.

Waste Management Issues and Strategies

Issues	Strategies
Complex and changing nature of waste types being managed by DOE	• Continuing efforts of the Office of Technical Support to obtain data and develop long-range plans for each waste type
Uncertainties created by nuclear weapons reconfiguration	• Close coordination to ensure adequate resources and safe management of waste and spent fuel
Public resistance to siting of waste management facilities	• Use of strategic and contingency planning and systems analyses
Regulatory uncertainty and conflict	• Improved education and public outreach
	• Health-based risk analysis for waste management operations
Minimization of future waste requiring costly management	• Initiation of DOE Waste Minimization Program

Figure 2.1.11b.



Environmental Restoration

2.2.0 PROGRAM OVERVIEW: ENVIRONMENTAL RESTORATION VISION AND STRATEGIC PLAN

The Environmental Restoration Program envisions a future in which the risks to human health and the environment have been minimized through successful remediation of contaminated sites and the decontamination and decommissioning of hundreds of buildings.

Vision

The Environmental Restoration Program directs the assessment and cleanup of inactive facilities and sites contaminated by waste generated from past nuclear operations.

The Environmental Restoration Program vision reflects the fundamental goal of environmental restoration: to ensure that risks to the environment and to human health and safety posed by contaminated inactive waste sites and surplus facilities either be eliminated or reduced to prescribed, safe levels by 2019.

The Environmental Restoration Program espouses the following values and beliefs as the guiding philosophy behind its vision:

- The Environmental Restoration Program is responsible to the public, its employees, and the communities it serves to ensure that its actions reflect high standards.
- Because the Environmental Restoration Program's future rests squarely on the knowledge, imagination, skills, teamwork, and integrity of its employees, these qualities are highly valued.
- Public confidence is the Environmental Restoration Program's most important product.
- All commitments are to be fulfilled.
- All work performed is to be of high quality.
- The Environmental Restoration Program is dedicated to control program costs as a responsibility to the American taxpayer.

Environmental Restoration Strategic Plan

The Environmental Restoration Strategic Plan summarizes the key planning assumptions that guide or constrain the effort, defines the specific objectives of the Environmental Restoration Program, and identifies the barriers that could potentially limit the program's success. The Strategic Plan addresses the Environmental Restoration Program mission, planning assumptions, objectives, targets and performance indicators, and potential obstacles.

Mission

The Environmental Restoration Program mission 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, acceptable levels.

In accomplishing this mission, the program will

- comply with all applicable regulations, agreements, and DOE Orders;
- establish cooperative cleanup approaches that involve the public, States, government agencies, industry, and other stakeholders;
- attain environmental cleanup using the most technically efficient and cost-effective means possible;
- ensure that the public interest, both environmental and economic, is served;
- establish long-term means for monitoring and maintaining sites; and
- contribute to the development of national capabilities to address environmental problems.

Planning Assumptions

The Environmental Restoration Program operates under specific conditions that determine how the program is planned, executed, and ultimately controlled. The Environmental Restoration Program's key planning assumptions are as follows:

- Resources will always be constrained. The sheer size and scope of the Environmental Restoration Program mission is such that demand for funding, personnel, and equipment will often exceed what is available. Accordingly, all planning should consider this constraint a key contingency.
- The Environmental Restoration Program expects regulations to become more stringent and is planning for tougher standards rather than more lenient ones.
- The Environmental Restoration Program will plan for all reasonable contingencies, including any difficulty the Waste Management and/or the Technology Development Programs experience in attaining their respective mission.
- For the duration of the program, adequate technical solutions to environmental restoration cleanup problems will be developed.

Objectives, Targets, and Performance Indicators

The Environmental Restoration Strategic Plan identifies seven distinct objectives (Figure 2.2.0). These objectives are then provided implementation actions or targets that are deemed necessary to implement each objective. Finally, performance indicators are established to measure the success of objective accomplishment to determine whether corrective actions or changes are necessary to ensure successful accomplishment of the stated objectives.

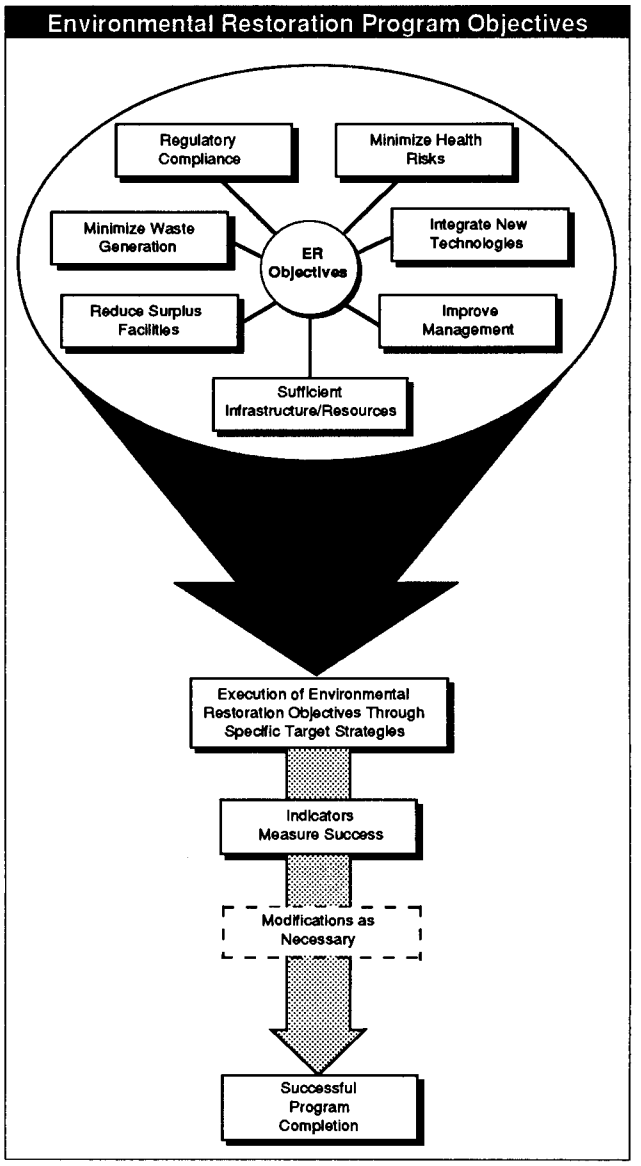


Figure 2.2.0. Environmental Restoration Program objectives are executed through target strategies and evaluated by indicators of performance.

Potential Obstacles

The Environmental Restoration Program anticipates obstacles to accomplishing its mission and fulfilling its objectives. Following is a list of these perceived and anticipated obstacles:

- Regulatory environment – The current regulatory environment includes potentially conflicting and unclear regulations. The current environment offers little, if any, incentive for the adoption of new and innovative technologies for cleanup or allowance for their development and testing as part of the cleanup process.
- Program overload – The Environmental Restoration Program needs to move from an environment of addressing day-to-day emergencies to one of long-term planning and progress to minimize program inconsistencies.
- Lack of infrastructure – Beyond funding issues, EM is faced with laboratory, personnel, and technology resource constraints.
- The public – Occasionally public misunderstanding of the nature of the waste and environmental management disposal techniques can delay environmental restoration progress.
- Environmental Restoration Program/EM Interdependence – Communication and cooperation among the Environmental Restoration Program, Technology Development Program, and Waste Management Program are essential. The Environmental Restoration Program must also prepare for delays and/or funding constraints in both the Technology Development and Waste Management Programs.
- Technological shortfalls – The Environmental Restoration Program must work closely with the Technology Development Program to develop the appropriate characterization and treatment technologies. Technology transfer must be expedited to prevent delays. Delays must also be prevented in the regulatory approval process for new technologies.
- Uncertainties (contingency planning) – The Environmental Restoration Program may face unexpected outcomes from site assessments and technology development, changing regulatory environment, and moving public priorities. Contingency planning to understand the impacts of these uncertainties must be performed.

Major Environmental Restoration Program Activities

The Environmental Restoration Program assessment and cleanup activities include remedial actions and decontamination and decommissioning. Remedial actions are concerned with all aspects of the assessment and cleanup of inactive release sites. The tasks associated with remedial actions 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. Most remedial actions activities are concerned with contaminated soil and groundwater.

Decontamination and decommissioning is primarily concerned with the safe caretaking of surplus nuclear facilities following safe shutdown and either their decontamination for reuse or their complete removal. Decontamination and decommissioning tasks encompass (1) surveillance and maintenance, (2) assessment and characterization, (3) environmental review, (4) engineering, (5) decontamination and decommissioning operations, and (6) closeout. Most decontamination and decommissioning activities are concerned with facilities such as reactors, hot cells, processing plants, storage tanks, and other structures from which no releases have been observed.

The Environmental Restoration Program is managed through three offices: the Office of Northwestern Area Programs, the Office of Southwestern Area Programs, and the Office of Eastern Area Programs. The Northwestern Area Programs include sites and

facilities located in California, Idaho, and Washington. Sites and facilities in ten States from Florida to California are within the Southwestern Area Programs, including the Uranium Mill Tailings Remedial Action (UMTRA) Project. The Eastern Area Programs include sites and facilities in 12 eastern and midwestern States. These area programs are discussed in more detail in Sections 2.2.4–2.2.6.

Environmental Restoration Program remedial actions are either under way or planned at more than 40 sites located in 19 States. An additional 33 sites come under the Formerly Utilized Sites Remedial Actions Program (FUSRAP) and 23 sites under the UMTRA Project. Cleanup has been completed at ten FUSRAP sites.

Regarding decontamination and decommissioning, approximately 500 contaminated facilities/buildings are in the current decontamination and decommissioning inventory at DOE installations. Contaminant release has occurred only at a relatively small number of these facilities. For most of the facilities, no release has occurred of any radioactive, hazardous, or mixed substances. Principal decontamination and decommissioning concerns pertain to safe caretaking and the ultimate collection, control, and disposal of contaminating substances and debris.

The programmatic alternatives for the Environmental Restoration Program's analysis in the EM Programmatic Environmental Impact Statement, in terms of risk to human health and the environment, have an overall goal of remediation of contaminated sites and decontamination and decommissioning of the existing inventory of inactive and surplus facilities by 2019. The alternatives involving removal and/or treatment of contaminants will be closely integrated with waste management alternatives. In recognition of the need for adequate and often new technical solutions to implement restoration decisions, a significant portion of EM's budgeted resources is devoted to technology development.

Key Environmental Laws and Regulations

CERCLA Cleanup Standards

For the inactive facilities and sites connected with environmental restoration, technical cleanup standards are derived primarily from the provisions of CERCLA, Section 121, "Cleanup Standards," codified by EPA in 40 CFR Part 300, Subpart F. Such provisions establish general criteria for selecting remedial actions and require compliance with standards from other environmental statutes (e.g., RCRA, Toxic Substances Control Act, Safe Drinking Water Act Clean Air Act, Clean Water Act, and State laws) to the extent that 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.

RCRA Standards

For facilities and sites cleaned up under RCRA, the standards applied are derived in a manner similar to that used under CERCLA (i.e., standards from other environmental statutes are used, and risk assessment techniques are employed). RCRA requirements are codified by EPA, principally in 40 CFR Parts 261–265. 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 Federal standards.

UMTRA Standards

For sites being cleaned up under the UMTRA Project, cleanup standards are codified by EPA in 40 CFR Part 192.

2.2.1 ENVIRONMENTAL RESTORATION: PROGRESS IN ESTABLISHING AN EFFECTIVE MANAGEMENT SYSTEM

DOE has made considerable progress putting into place the formal structure for managing its Environmental Restoration Program. This structure provides for planning, budgeting, funding allocation, performance measurement and assessment, and change control of environmental restoration activities within a framework of approved technical, schedule, and cost baselines.

The Environmental Restoration Program was established on November 1, 1989, to deal with the environmental cleanup of the sites and facilities connected with the DOE nuclear complex. The intent was, and remains, to provide the structure, documentation, and formal procedures to plan, track, and manage activities related to program formulation, budgeting, execution, and evaluation. The underlying concept that forms the basis for the Environmental Restoration Management System conforms in broad measure to the requirements of Secretary of Energy Notice 25A-91, "Strategic Planning Initiative," and DOE Order 4700.1, "Project Management System."

The outline of this concept is carried out within DOE's planning and budgeting framework and is characterized by (1) strategic planning to meet Secretarial policies and strategies, (2) identification of program issues requiring resolution, (3) establishment of baselines and formal DOE management approval of such baselines, (4) specification of allowed variances from the approved baseline, (5) regulatory reporting and assessment of status against the approved baseline, and (6) corrective management action if a variance exceeds a prescribed threshold. The process and the applicability of DOE Order 4700.1 was subsequently reaffirmed by Secretary of Energy Notice 27-90, "Strengthening the Department of Energy Project Management System."

Approach to Establishing Management Systems

The management approach that has been developed is shown schematically in Figure 2.2.1a. The management system is structured to comply with the requirements set forth in Secretary of Energy Notice 25A-91, DOE Order 4700.1, and Secretary of Energy Notice 27-90 and at the same time meet the special nature and needs of the Environmental Restoration Program. Considerable progress in putting this management system into operation has been made; the operational concept has been formulated, and many of the actual components are in place. This structure provides for planning, budgeting, funds allocation, performance measurement and assessment, and change control. To illustrate this progress by comparison, Figure 2.2.1b shows that few of these management system elements were in place 18 months ago.

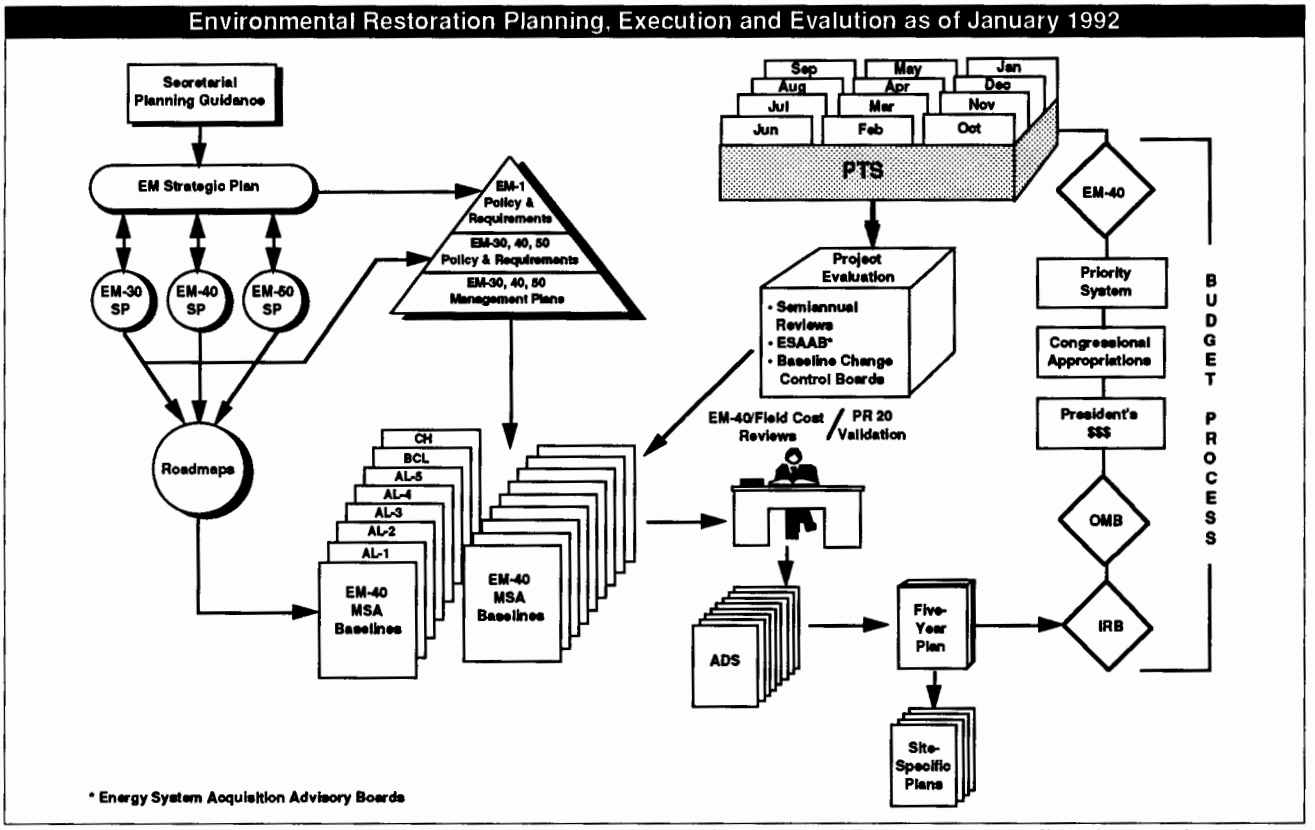


Figure 2.2.1a. The Environmental Restoration Management System in place as of January 1992 has filled in the voids of a year ago as shown in Figure 2.2.1b.

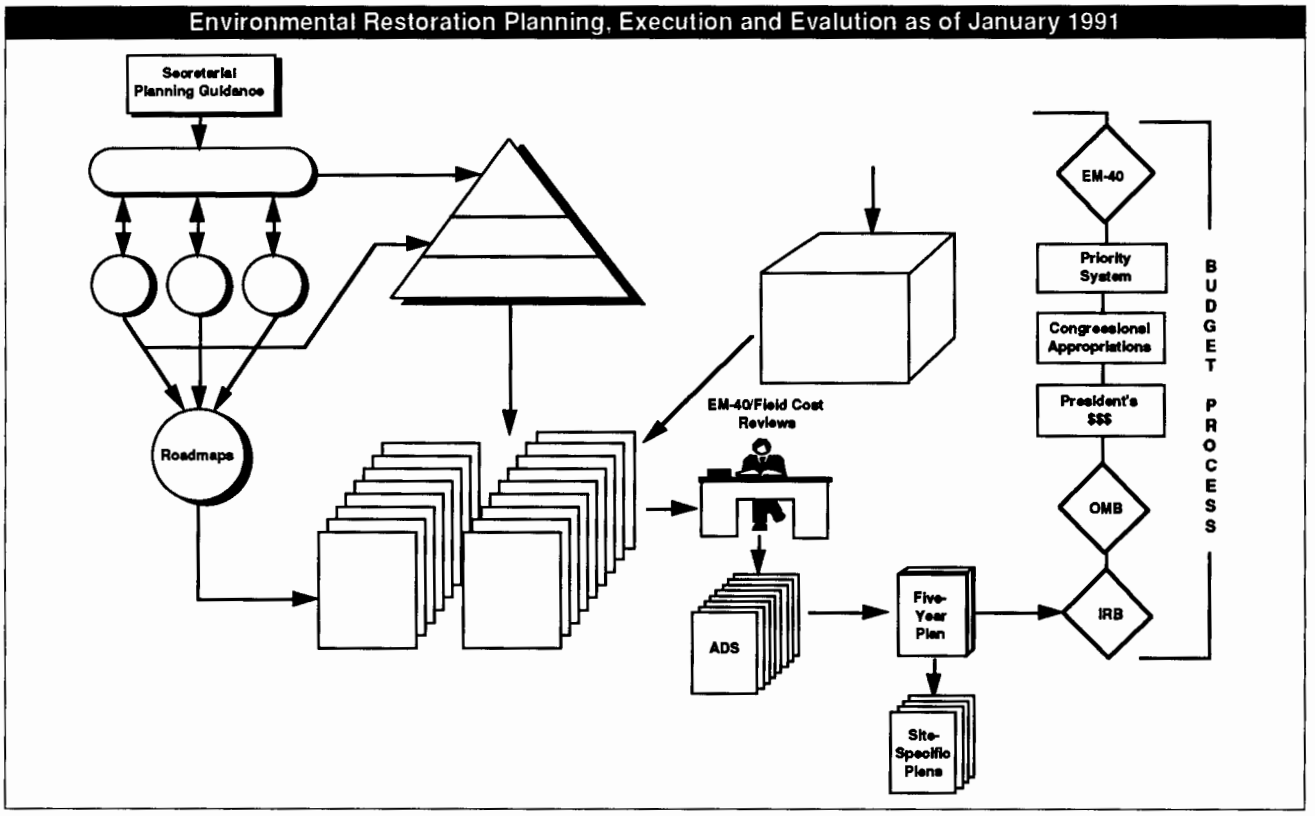


Figure 2.2.1b. The Environmental Restoration Management System as of January 1991.

Following are significant improvements made during the past year.

Environmental Restoration Strategic Plan

The Environmental Restoration Strategic Plan is derived from the overall guidance set forth in the Strategic Plan for Environmental Restoration and Waste Management (Appendix C). The Strategic Plan describes the overall planning framework, including the vision mission, assumptions, and potential obstacles upon which the formulation of the Environmental Restoration Program is based.

Environmental Restoration Policy and Requirements Document

The Environmental Restoration Policy and Requirements Statement is derived from requirements prescribed by the EM Management Policy and Requirements Document, which sets forth the management approach to be used in carrying out the mission of the Environmental Restoration Program. It provides the framework and guidance for developing, executing, and managing the Environmental Restoration Management System.

Environmental Restoration Program Management Plan

The Environmental Restoration Program Management Plan is intended to translate policies and requirements into a specific environmental restoration approach to managing work required to accomplish the program mission. This Environmental Restoration Program Management Plan sets forth the formal procedures for formulation, execution, and evaluation of program activities.

Baselines

EM has aggregated Environmental Restoration Program activities into project groupings at the various DOE installations to serve as an approved technical, schedule, and cost standard against which accomplishments, progress, and expenditures can be measured and the project controlled. Baselines are discussed in detail in Section 2.2.2.

Cost Reviews and Validation

The cost, schedule, and technical scope for each project are thoroughly reviewed. This review includes an independent validation by the Office of Program/Project Management and Control.

Progress Tracking System

The Progress Tracking System is a computerized reporting data base designed to provide a consistent format for DOE Field Offices to provide Headquarters with planned versus actual project data, compliance milestone status, and a progress narrative—all on a monthly basis.

Project Evaluation and Baseline Change Control

The status and progress of Environmental Restoration Program projects are to be evaluated through a process of regular reporting against an approved baseline. Corrective management action is taken if a variance from the technical, schedule, or cost baseline exceeds a prescribed threshold. If a baseline revision is indicated, any such change is subject to formal procedures for securing approval of the change. (See Section 2.2.2 for more detail.)

2.2.2 SUCCESS IN DEVELOPING ENVIRONMENTAL RESTORATION PROGRAM BASELINES AND ASSOCIATED MANAGEMENT SYSTEMS

Environmental Restoration Program activities are managed through definition and control of technical scope, schedules, and costs using a project management structure based on DOE Order 4700.1 requirements.

A major initiative, described in the FY 1993–1997 Five-Year Plan (Section 2.3.1.2.1) and undertaken in FY 1992, institutionalizes the basic project management principles of DOE Order 4700.1, "Project Management Systems." This initiative bridges the gap between activity-based management and project-oriented management. The key to implementing the new project-oriented structure is the development of technical, schedule, and cost baselines. The *technical baseline* documents the technical requirements needed to achieve a stated mission. The *schedule baseline* identifies activity durations and milestones signifying status and completion of that mission. The *cost baseline* is the total cost to complete the technical baseline according to the schedule. These baselines, when established, serve as the primary tool for project managers to successfully guide their projects through the planning, execution and control cycle common to all projects.

Activities versus Projects

Until this year, the Environmental Restoration Program managed its activities in an organization that was defined by Field Offices and installations. As a result of implementing a new project-oriented management approach, a new organizational alignment has been developed. Seventeen major environmental restoration projects have been identified (Figure 2.2.2a) by aggregating all environmental restoration activities in a logical manner that recognizes both historical and new management philosophies. This arrangement is formalized in DOE Order 4240.1K. These projects include multiple and existing subprojects with

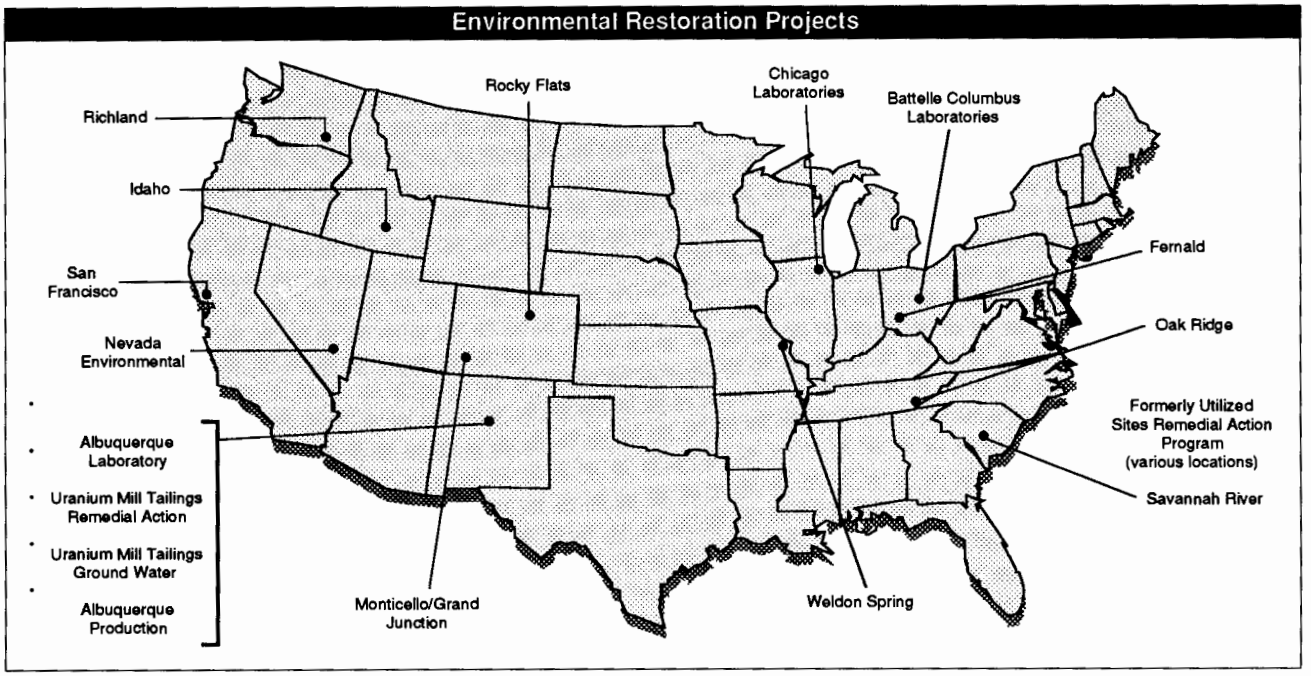


Figure 2.2.2a. Environmental Restoration Program's 17 major projects are spread across the United States.

diverse cleanup strategies and varying levels of technical definition, established milestones, and estimated costs. The subprojects include all activities needed to assess and clean up a site and are identified by Activity Data Sheets on a one-for-one basis.

Evolution of the Environmental Restoration Baseline System

Evolution of environmental restoration baselines has followed a path marked by a well planned and coordinated effort. The process reflects a "building up" nature where each step depends on the successful completion of the preceding step. This process is described in Figure 2.2.2b.

The first significant milestone was the development and communication of a Programwide Work Breakdown Structure. The Programwide Work Breakdown Structure presents the program and its stakeholders with a map identifying all the elements required to support the program's mission. The Programwide Work Breakdown Structure provides a solid structure to support the new management approach.

Baseline guidance was issued that reflects the findings from the 1991 program cost review and accommodates the unique nature of environmental restoration projects. The guidance provides specific procedures for developing technical, schedule, and cost baselines. Four baseline workshops were held in October and November 1991 to train program managers on the use of the guidance and to respond to questions or concerns.

The Field Offices prepared the baseline information and submitted it to Headquarters for review in early 1992. A procedure was established to ensure consistency of review and to provide guidance for validating the projects. The procedure for validating the projects was coordinated with Procurement and the Comptroller. Project validations for FY 1994 activities in the baseline were conducted in January through May 1992. This validation process ensures that the project baselines are consistent and reasonable.

The validated baselines, in addition to supporting input to the FY 1994–1998 Five-Year Plan, will be used extensively in preparing the first rounds of project plans for all environmental restoration projects. The project plans should be completed during 1993.

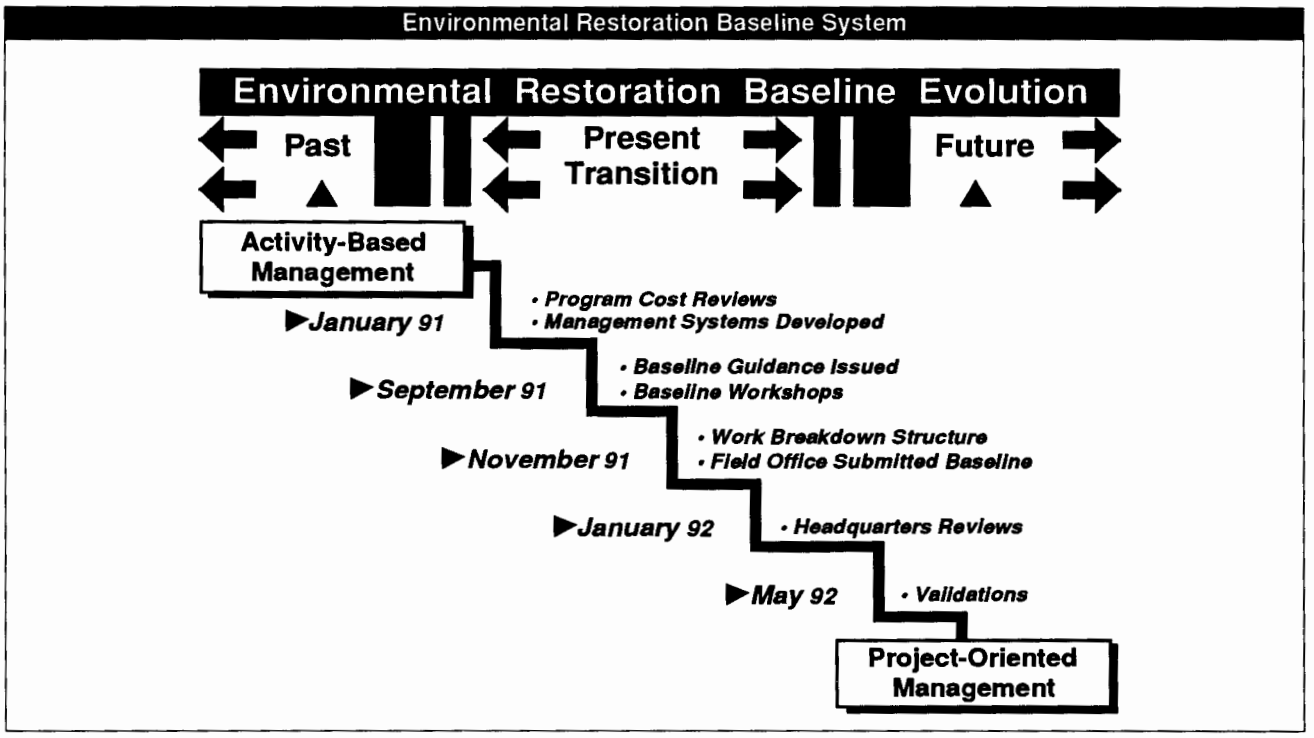


Figure 2.2.2b. The Baseline System provides a comprehensive process for the development and analysis of Environmental Restoration Program projects.

2.2.3 INITIATIVES THAT SUPPORT THE ENVIRONMENTAL RESTORATION MANAGEMENT SYSTEM

The Environmental Restoration Program staff continues to introduce new initiatives designed to support the current management system to ensure a more streamlined, cost-effective operation.

The Environmental Restoration Program staff has introduced several new initiatives that support the current management system described in Section 2.2.1. These initiatives, which include studies, automated systems, and operational programs, can be effectively used as management tools at Headquarters and by Field Offices in the conduct of their programs.

These new initiatives and programs can be employed either independently or in conjunction with other management systems and tools. They enable Headquarters and Field Offices to operate more efficiently and effectively, especially with constrained budgets and limited staff personnel.

Self-Assessment Program

The Environmental Restoration Program has structured its self-assessment program to comply with the Secretary of Energy's guidance requiring senior DOE officials to ensure that their contractors conduct operations in a manner that complies with operational, environmental, safety, health, and security standards established by law or regulation. EM-wide self-assessment efforts are also discussed in Section 1.6.

The operative concept of the Environmental Restoration Program's self-assessment program is that it can be used as a diagnostic tool to evaluate line management performance and optimize the quality and excellence of operations. The general philosophy of self-assessment is that line organizations should continually and critically examine their effectiveness. They should identify strengths and weaknesses, determine root causes for weaknesses, and design, implement, and evaluate the effectiveness of corrective actions.

The self-assessment process consists primarily of (1) a variety of evaluation activities that generate a stream of performance and compliance data and (2) a formal system for analyzing the data and communicating status and lessons learned information to management for managing corrective actions. The program is intended to avoid duplication of effort by relying on the existing hierarchy of currently available evaluations conducted by Headquarters, Field Offices, and contractors.

Information System and Integrated Data Base

The Information System and Integrated Data Base are being developed as a new management initiative to facilitate the increased exchange of data between Headquarters and the Field Offices. This system is intended to be compatible with Field Office data bases, eliminate obsolete and redundant systems, and enhance opportunities for shared software. In time, individual systems will be consolidated into the Information System and Integrated Data Base.

The new Information System and Integrated Data Base will greatly facilitate the transfer of information between the Field Offices and Headquarters to ensure that all parties have access to the same, current data. This new management tool will support program managers and provide them with the necessary data to make better, informed decisions.

Quality Assurance Program

DOE Order 5700.6(c) mandates the establishment of the Environmental Restoration Program's Quality Assurance Program and the EM Quality Assurance Requirements Document. The Quality Assurance Program and its requirements apply to all items, activities, and processes managed by the Environmental Restoration Program. The criteria to be evaluated are organized under three main categories: management, performance, and assessment. The Environmental Restoration Program's Quality Assurance Program functions to verify the quality of work done at Headquarters, to ensure that personnel are qualified to do the work they are assigned to perform, and to ensure that documents that authorize the work are properly maintained.

The Quality Assurance Program is intended to foster senior management involvement at all program levels including DOE and contractor management. Line and senior management is responsible for identifying and investigating conditions of adverse quality that may require corrective action or work stoppage. Quality assurance of performance criteria is delegated to the Field Offices and EM-managed contractors. However, Environmental Restoration Program line managers are responsible for assessing the status of work associated with identification and control of items; handling, storage, and shipping; and control of measuring and test equipment.

The assessment category includes both management and independent assessment. In the management classification, senior and line managers are to annually evaluate the scope, adequacy, status, and effectiveness of their programs. Under the independent assessment quality assurance program, audits and appraisals are conducted by the quality assurance manager and/or other managers not related to the program.

Priority System

As discussed in Section 1.5, EM budgets are developed to ensure that all legal requirements for environmental restoration are fully met, including provisions of Federal Facilities Agreements negotiated with EPA and the States. The Environmental Restoration Program has developed a priority system specifically for environmental restoration activities to be used by DOE management to evaluate alternative funding allocations when congressional funding is above or below that funding level required to meet legal requirements. The priority system helps ensure that DOE allocates cleanup funds so that both local priorities and national restoration objectives are considered fairly.

Activities requiring funding are placed into one of the following three categories:

1. Emergency activities (Class 1),
2. Time-critical activities (Class 2), and
3. Other high-benefit and time-sensitive activities (Class 3).

Emergency activities (Class 1) are funded immediately without going through the priority

system, and time-critical activities (Class 2) are ensured funding in the annual budget. Other activities (Class 3) are subjected to the risk-based priority system. These activities are rank ordered by Field Office program management, reviewed by Headquarters program managers, and then aggregated to determine the best combinations for the finite resources available.

Agency for Toxic Substances and Disease Registry Baseline Studies

Under CERCLA, the Agency for Toxic Substances and Disease Registry (an agency of the U.S. Public Health Service within the Department of Health and Human Services) is responsible for conducting health assessments at all sites on or proposed for the National Priorities List (NPL). Accordingly, the Agency will play a significant role at DOE sites undergoing environmental restoration associated with hazardous waste sites. The Agency accomplishes this mission by conducting health assessments that evaluate data and information on release of hazardous substances into the environment. In this way, the Agency can assess any current or future impacts on public health, develop health advisories, recommend additional activities, and identify studies or actions needed to evaluate and mitigate or prevent human health effects.

On August 19, 1991, an Interagency Agreement was signed between DOE and the Agency for Toxic Substances and Disease Registry to cover the Agency's work at all NPL sites and other high-priority DOE facilities through FY 1992. The Agency's activities will continue under a new Memorandum of Understanding and Interagency Agreement now being developed.

During site visits, a team of health physicists, engineers, physicians, and geologists from the Agency for Toxic Substances and Disease Registry collects information about a site through entrance and exit briefings, site tours, and meetings with environmental restoration and waste management officials, natural resources representatives, and environmental representatives. Agency representatives also meet with State and local health officials during the site visit. After a site visit, the Agency immediately conducts follow-up exercises; these follow-up exercises include requesting and receiving additional documentation from DOE, including consultations regarding environmental sampling and analysis data, meteorological data, health records, and chemical release information. The data are then analyzed along with the information gathered during the site visits.

The Agency completed its preliminary site visits to NPL and high-priority DOE sites in FY 1992. These sites included: Lawrence Livermore National Laboratory, Weldon Spring Site, Los Alamos National Laboratory, Mound Plant, Fernald Environmental Management Project, Brookhaven National Laboratory, Monticello Site, Hanford Site, Rocky Flats Plant, Oak Ridge Reservation, Savannah River Site, Maywood Site, Pantex Plant, Portsmouth Gaseous Diffusion Plant and Idaho National Engineering Laborary.

The Agency will conduct an independent evaluation of its findings, prepare a health assessment that describes current or future effects on public health, and recommend further actions and studies. The Agency's activities required under CERCLA and the additional health consultations will improve DOE's ability to accomplish its mission of identifying and addressing risks to human health and safety posed by inactive and surplus facilities.

Streamlining Regulatory Compliance

The Observational Method Approach to Remediation

The observational method approach, commonly used in geotechnical engineering, is directly applicable to hazardous waste site remediation. This approach uses a relatively small, validated set of data on site conditions (contaminants, soil properties, etc.) to develop a conceptual model of the site. This model of the most probable site conditions includes identification of reasonable deviations from those conditions based on variations in existing data and scientific knowledge of natural processes (e.g., groundwater flow and chemical interactions). The conceptual model is then used to develop the remedial design and to prepare contingency plans for each potential deviation from the expected site conditions. As a result, the final remediation approach includes flexibility to deal with unexpected conditions that may be encountered during remediation. The observational approach also includes identification of specific parameters to be monitored during remedial action to detect deviations from the expected conditions. New data discovered at any phase can be used to update the conceptual model of the site and to revise the contingency plans where necessary.

The principal feature of the observational method is its explicit recognition of uncertainty. The approach has been shown to be cost-effective in mining, oil exploration, and underground excavation. It balances the high cost of extensive site characterization, which can reduce uncertainty, against the technical ability to effectively deal with uncertainty and variations in site conditions. Because site characterization is the first phase of any remediation project, streamlining this process not only saves cost but can dramatically shorten the time it takes to start actual remediation of a site.

Although this approach cannot be used on all sites, the Environmental Restoration Program believes that the observational method holds particular promise for a significant number of CERCLA and other hazardous waste site remediation activities. The elements of the method are applicable to every phase of the investigatory process. By specifically focusing remediation planning on the potential for unexpected conditions and the development of contingency plans, the observational method also can reduce remediation risks.

CERCLA/National Environmental Policy Act Integration

The Deputy Assistant Secretaries for Oversight and Self-Assessment and Environmental Restoration established a CERCLA/National Environmental Policy Act working group in January 1992. The working group includes members from the Office of Environment, Safety and Health and the Office of General Counsel. The purpose of this working group is to develop and issue implementing guidance for EM Headquarters and Field Offices to use in planning and conducting CERCLA response actions. The guidance will specifically address the preparation of various CERCLA documents such that National Environmental Policy Act values are embodied within the CERCLA framework. The working group will also evaluate the document review and approval cycles within Headquarters, with the overall goal of improving accountability as well as the efficiency and timeliness of Headquarters review and approval.

Value Engineering

The Environmental Restoration Program has established a value engineering initiative in accordance with DOE Order 4010.1, "Value Engineering." Value engineering is an effort to use trained engineering personnel to analyze functions of systems, equipment, facilities, services, and supplies

for the purpose of achieving the essential functions at the lowest life cycle cost consistent with required performance, reliability, quality, and safety.

Value engineering is accomplished with organized interdisciplinary teams employing approved problem-solving techniques to provide a quality product or service at the lowest possible cost. Value engineering will help the Environmental Restoration Program to ensure that, in times of budget constraints, the essential and necessary job of cleaning up the environment is conducted as expeditiously and efficiently as possible.

Cost/Schedule

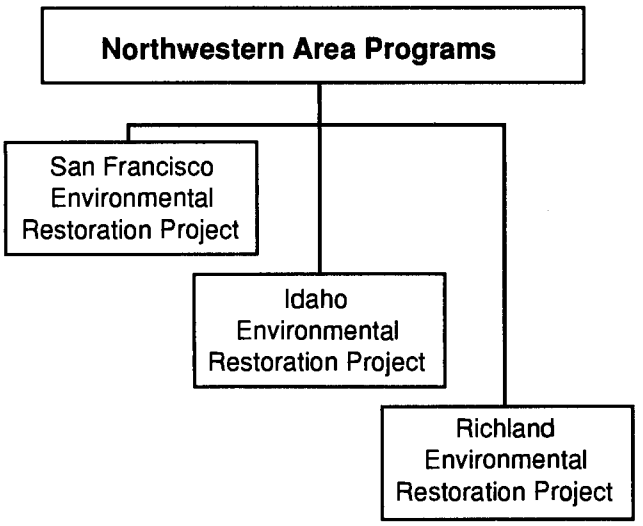
The Environmental Restoration Program has become proactive in its efforts to improve the realism and accuracy of current cost and schedule estimates for assessments and cleanup. In addition to issuing baseline guidance (Section 2.2.2) containing comprehensive cost and schedule guidance, the following initiatives were completed:

- The Environmental Restoration Code of Accounts will collect estimated or actual costs. It will also provide a mechanism of exchanging cost data with other members of the Interagency Cost-Estimating Group. The draft Environmental Restoration Code of Accounts has been completed.
- The Regulatory Impact Study will identify and document circumstances that cause DOE environmental restoration costs to exceed those experienced by other Federal agencies and private sector companies conducting similar projects. The final draft report has been completed.
- HAZRISK is a computer-based set of models/tools that will enable cost estimators to quickly develop order-of-magnitude cost estimates and contingency requirements. The cost-driver report has been completed, and a peer review of the tools has been conducted.
- The Cost- and Schedule-Estimating Team is composed of Headquarters staff and Field Office representatives. The team mission is to develop/expand cost- and schedule-estimating guidelines; provide peer review and comment on Headquarters initiatives, cost/schedule tools, and Five-Year Plan input; develop a research agenda for cost/schedule issues; and provide a mechanism for transferring cost/schedule information across the complex. The Cost- and Schedule-Estimating Team has been convened.
- The purpose of the Interagency Cost-Estimating Group is to establish a network of Federal agencies to collect and share hazardous, toxic, and radiologic and waste remediation cost information and related data. DOE has been an active participant in this organization.

2.2.4 NORTHWESTERN AREA PROGRAMS

The goal of the Environmental Restoration Program at the following sites—the Hanford Site at DOE Richland Field Office, Idaho National Engineering Laboratory under DOE Idaho Field Office, and the seven installations under DOE San Francisco Field Office—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 Northwestern Area Programs include both DOE and contractor-owned sites and facilities located in California, Idaho, and Washington. The environmental restoration efforts at the sites and facilities have been designed as three separate projects. Additional information on the activities within the Northwestern Area Programs can be found in Volume II, Installation Summaries, of this Five-Year Plan.



Idaho National Engineering Laboratory

Idaho National Engineering Laboratory (INEL) covers nearly 890 square miles in southeastern Idaho. There are 368 inactive hazardous waste and hazardous substance release sites that are divided into ten areas known as Waste Area Groups. The ten Waste Area Groups are divided into 98 operable units, based on geographic proximity, similarity of the waste characteristics and site types, and the possibilities for economy of scale. Testing has identified some organic and low-level radionuclide contamination in the Snake River aquifer.

Hanford Site

The Environmental Restoration Program at Hanford includes approximately 1100 inactive hazardous waste and hazardous substance release sites, varying in size from very small to 1800 acres in size, which have been grouped into 78 operable units that have characteristics amenable to combined characterization and/or remediation. These 78 operable units have been organized into four distinct aggregate areas (i.e., 100 Area, 200 Area, 300 Area, and the 1100 Area) and have been included by EPA on the National Priorities List.

DOE San Francisco Field Office

The Environmental Restoration Program at the DOE San Francisco Field Office includes activities that are associated with the management, cleanup, and disposal of radioactive, hazardous, and mixed waste resulting from DOE's past operations at various facilities in California. These facilities include the Lawrence Livermore National Laboratory, General Atomics facility, DOE portion of the Santa Susana Field Laboratory, General Electric Vallecitos Nuclear Center, Lawrence Berkeley Laboratory, Stanford Linear Accelerator Center, and Laboratory for Energy-Related Health Research.

Accomplishments

Idaho National Engineering Laboratory

A Federal Facility Agreement and Consent Order was signed by DOE, EPA, and the State of Idaho on December 9, 1991, and supersedes the existing RCRA 3008(h) Consent Order and Compliance Agreement of 1987. Overall objectives of the Federal Facility Agreement and Consent Order are to characterize and clean up the INEL, based on the following "bias for action": (1) interim actions will be used to proceed quickly with cleanup, (2) site characterization will be planned on the basis of optimizing field sampling and maximizing use of available data, and (3) treatability studies will proceed promptly to establish technologies that are appropriate for restoration of complex units. Milestones have been developed for each Waste Area Group at INEL and were incorporated into the Federal Facility Agreement and Consent Order. Specific accomplishments since the FY 1993–1997 Five-Year Plan include receiving proposals for a contract with the private sector to demonstrate existing technologies for remediation of buried waste at Pit 9 in the Radioactive Waste Management Complex; Records of Decision (RODs) for remediation of the Warm Waste Pond at the Test Reactor Area, unexploded ordnance, and an operable unit at the Power Burst Facility; draft Interim Action Proposed Plans for two operable units; and closure plans for 14 land disposal units.

Hanford Site

Accomplishments since the FY 1993–1997 Five-Year Plan include completion of the draft Environmental Impact Statement for the Surplus Production Reactors, approval of the Agreement-in-Principle to perform Expedited Response Actions, completion of cleanups at two Expedited Response Actions sites (one additional Expedited Response Action is under way), renegotiation of the scope of work on the first ten operable units to streamline the site characterization process, continued characterization and assessment of 11 operable units, and removal of solid waste from the 183-H Solar Basins.

DOE San Francisco Field Office

Significant accomplishments have been made at San Francisco sites since the FY 1993–1997 Five-Year Plan. Lawrence Livermore National Laboratory completed the final Proposed Remedial Action Plan and draft RODs for the Main Site Groundwater Project. Three preliminary Remedial Investigation Reports on areas at Site 300 were completed at Lawrence Livermore National Laboratory and will be included in the sitewide Remedial Investigation. Treatment of contaminated groundwater off-site continued at both the Main Site and Site 300. In addition, negotiations were completed for the Site 300 Federal Facilities Agreement, which was signed in June 1992. Santa Susana Field Laboratory continued decontamination and decommissioning at two buildings and initiated decontamination and decommissioning at three others, bringing radioactivity removal to 90 percent completion in FY 1992. Groundwater investigations continue both on- and off-site at the Santa Susana Field Laboratory. Closure of the Sodium Disposal Facility at Santa Susana Field Laboratory will be completed in FY 1993. Laboratory for Energy-Related Health Research completed disposal of Imhoff tank sludge and the cobalt-60 irradiator source in FY 1992 and initiated decontamination and decommissioning of the animal hospitals. At Lawrence Berkeley Laboratory, RCRA Facility Assessment information was collected and provided to the Federal and California EPA. At Stanford Linear Accelerator Center, soil and groundwater investigations were initiated. Decontamination and decommissioning planning activities were initiated at the General Atomics facility and the General Electric Vallecitos Nuclear Center.

Milestones

Idaho National Engineering Laboratory

The Federal Facility Agreement and Consent Order was signed on December 9, 1991, in accordance with CERCLA, Section 120. The Federal Facility Agreement and Consent Order integrates INEL responsibilities under CERCLA, RCRA, and all other applicable State and Federal regulations with respect to remedial activities. The Federal Facilities Agreement and Consent Order defines a ten-year program for obtaining RODs for all INEL Waste Area Groups. Significant FY 1992, FY 1993, and outyear milestones include the following:

- Signed Interim Action ROD for Test Reactor Area Warm Waste Pond, Dec. 1991.
- Submitted RI/FS Work Plan for the TAN Injection Well, Dec. 1991.
- Submitted draft Interim Action ROD for Pit 9, Dec. 1992.
- Signed Interim Action ROD for cleanup of unexploded ordnance for all of INEL, June 1992.
- Submitted draft Interim Action ROD for Test Area North Injection Well, June 1992.
- Submitted Perched Water draft ROD, Oct. 1992.
- Submitted draft ROD for Motor Pool Pond, Oct. 1992.
- Signed Interim Action ROD for Power Burst Facility Chemical Pond, Sept. 1992.
- Signed draft Interim Action ROD for ARA Evaporation Pond, Dec. 1992.
- Completed decommissioning of Boiling Water Reactor-Experimental V Turbine Building, Sept. 1992.
- Completed decommissioning of Special Power Excursion Reactor Test-IV Waste Piping, Sept. 1992.
- Completed chloride removal system decontamination and decommissioning, Sept. 1992.
- Signed Interim Action ROD for Test Area North Injection Well, Sept. 1992.
- Submitted Statement of work for the CFA Landfill RI/FS, Aug. 1992.
- Complete D&D of SLI heavy equipment at Auxiliary Reactor II, Feb. 1993.
- Complete decommissioning of Central Facilities Area-669 Hot Laundry, June 1993.
- Submit draft ROD for transuranic pits and trenches, July 1998.
- Submit draft comprehensive final RODs for three of ten Waste Area Groups, Aug. 1998.

Hanford Site

Significant FY 1993 and outyear milestones include the following:

- Submit six Remedial Investigation/Feasibility Study or RCRA Facility Investigation/Corrective Measures Study (RFI/CMS) work plans per year, beginning CY 1993.
- Complete integrated general investigations and studies for 100 Area, Sept. 1993.
- Submitted 1100-EM-1 Feasibility Study Phase III Report to regulators for review, Dec. 1992.
- Submit 200-BP-1 Feasibility Study Phase III Report to regulators for review, Mar. 1995.
- Submit 300-FF-1 Feasibility Study Phase III Report to regulators for review, Aug. 1994.

DOE San Francisco Field Office

The completion of environmental restoration baselines and the ongoing effort to complete roadmaps for the DOE San Francisco Field Office subprojects identified a realistic schedule for cleanup. Major FY 1992, FY 1993, and outyear milestones follow:

Lawrence Livermore National Laboratory Main Site

- Submitted Draft Final ROD to regulators, June 1992.
- Submitted Draft Final Remedial Action Implementation Plan to regulators, Nov. 1992.
- Submit Draft Final Remedial Design (RD) Reports to regulators:

  RD#1, Feb. 1993
  RD#2, Aug. 1993
  RD#3, Feb. 1994
  RD#4, July 1994
  RD#5, June 1994

Lawrence Livermore National Laboratory Site 300 FFA

- Begin Central General Services Area Removal Activities, Oct. 1992.
- Submit Final Sitewide Remedial Investigation to regulators, Jan. 1993.
- Submit Draft Final ROD for:

  OU1, FY 1995
  OU2, FY 1995
  OU3, FY 1995
  OU4, FY 1995
  OU5, FY 1996
  OU6, FY 1996

Lawrence Berkeley Laboratory

- Submit RFI Report to regulators, Feb. 1997.

Stanford Linear Accelerator Center

- Complete groundwater Remedial Investigation, June 1994.
- Complete soil Remedial Investigation, March 1995.

Santa Susana Field Laboratory

- Complete decontamination and decommissioning of Building 059 for unrestricted use, March 1993.
- Complete decontamination and decommissioning of Radioactive Waste Material Disposal Facility, Sept. 1996.
- Completed decontamination and decommissioning of Building 064, Nov. 1992.
- Complete decontamination and decommissioning of Building 005, Jan. 1993.
- Complete decontamination and decommissioning of Building 023, Sept. 1993.
- Complete decontamination and decommissioning and demolish Building 020, Aug. 1995.
- Complete clean closure of Sodium Disposal Facility for unrestricted use, FY 1993.

Laboratory for Energy-Related Health Research

- Complete decontamination and decommissioning and release of animal hospitals, Mar. 1993.
- Complete decontamination and decommissioning of Imhoff facility and dog pens, Sept. 1995.
- Complete decontamination and decommissioning and release of Tank Trailer and Cobalt-60 Facility, Mar. 1994.

General Atomics Facility

- Complete decontamination and decommissioning, FY 1996.

General Electric Vallecitos Nuclear Center

- Complete decontamination and decommissioning, FY 1998.

Issues and Strategies

Idaho National Engineering Laboratory

Public concern exists over the remediation of soil and potential groundwater contamination by long-lived radionuclides buried as part of past operations at INEL. DOE is interacting on a peer review basis with an independent panel, composed of highly qualified individuals from academia, Government, and industry, convened by the National Research Council's Board on Radioactive Waste to advise and comment on DOE's technical and management activities associated with this

remediation effort. An interim action for Pit 9 of the Radioactive Waste Management Complex at INEL will be undertaken during FY 1993 and FY 1994 to employ existing private sector technologies for the remediation of Pit 9.

Hazardous substances at levels exceeding drinking water standards have been found in the Snake River Plain aquifer beneath INEL. It is believed that this contamination has been caused by land disposal and injection well activities as a part of past operations at INEL. Site investigations are being conducted at INEL to further characterize this contamination and develop alternatives for its remediation. At this time, all such characterization activities are planned to be completed by the end of FY 2000. Interim actions are in progress to address remediation of sites with the highest risk. Most remediation activities are anticipated to be completed by FY 2005, with the possible exception of the buried transuranic waste. Depending on the remedy selected, remediation of this unit may not be completed until 2019.

Hanford Site

Planned future use of the land now occupied by the Hanford Site is a major issue now facing DOE, regulators, and the public. This land use is of particular concern to Native Americans and others of the local populace for the areas adjoining the Columbia River and the City of Richland. Important questions dealing with a possible on-site, permanent waste disposal site; soil and groundwater cleanup levels; and land-use scenarios remain unanswered.

Expedited Response Actions were initiated in FY 1991 and continued in FY 1992. The Expedited Response Actions process allows DOE to achieve accelerated cleanup at sites where an immediate threat to public health or to the environment exists. As mentioned in the FY 1993–1997 Five-Year Plan, "Past Practice Investigation Strategy" was developed and incorporated into the Tri-Party Agreement in 1991. This strategy includes the Aggregate Area Management concept, where efficiencies of scale will be realized by dealing with larger blocks of the site during characterization and assessment than would normally be done with an operable unit approach. A Hanford Site roadmap for the entire Environmental Restoration Program was completed in June 1992 in draft form. The roadmap identifies program issues and problems and provides a logical base for subsequent project planning.

DOE San Francisco Field Office

Environmental restoration will be conducted at San Francisco sites in compliance with all applicable Federal and State laws and DOE Orders with the goal of meeting the Secretary of Energy's commitment to clean up DOE sites by 2019. The Lawrence Livermore National Laboratory Main Site and Site 300 will follow a cleanup strategy as outlined in CERCLA and signed Federal Facilities Agreements. Negotiations for the Federal Facilities Agreements for Site 300 were completed in FY 1992.

Lawrence Berkeley Laboratory will follow a RCRA corrective actions strategy for assessment and cleanup. Cleanup at the Stanford Linear Accelerator Center will continue in accordance with the Toxic Substances Control Act and CERCLA. The General Atomics facility and General Electric Vallecitos Nuclear Center decontamination and decommissioning will be performed to release these facilities for future use by their owners.

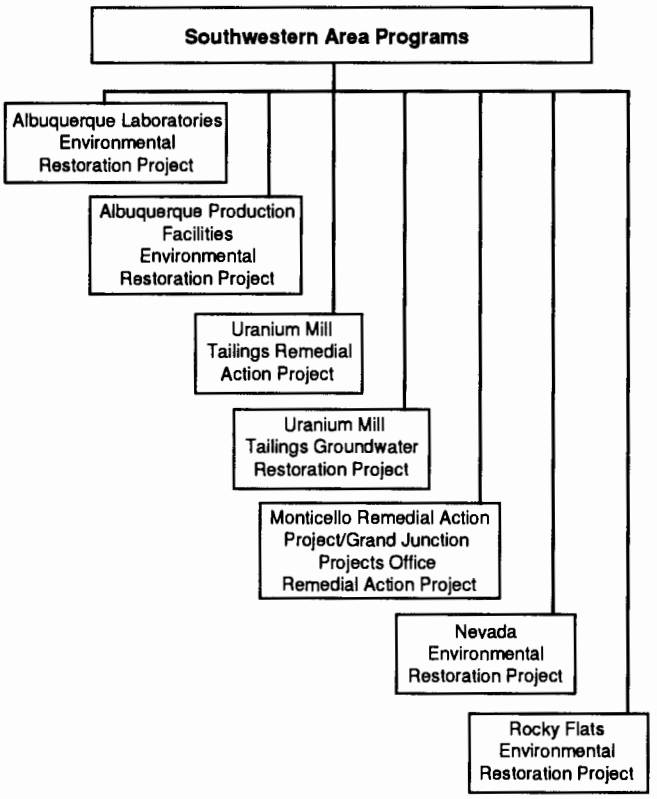
At Santa Susana Field Laboratory, a comprehensive sitewide approach will be used to assess and clean up groundwater in accordance with CERCLA guidelines. This approach will combine information from Rockwell and DOE portions of the site. Groundwater treatment from DOE portions will be accomplished using existing Rockwell treatment facilities.

DOE and the University of California, Davis, entered into a Memorandum of Agreement on March 30, 1990, for cleanup of DOE contamination at the site and return of the remediated facilities to the University for reuse. DOE is awaiting further information from EPA on the site's status with regard to inclusion on the CERCLA National Priorities List. The University of California is expected to be the lead agency for groundwater cleanup at the Laboratory for Energy-Related Health Research.

2.2.5 SOUTHWESTERN AREA PROGRAMS

The Southwestern Area Programs is fully committed to assessing and restoring inactive waste sites and facilities within the DOE Albuquerque Field Office, the DOE Nevada Field Office, and the Rocky Flats Office.

The Southwestern Area Programs include DOE, contractor-owned, and privately owned sites and facilities located in ten States from Florida to California. Environmental Restoration Program efforts at the sites and facilities have been designated as seven separate projects as shown below.



DOE Albuquerque Field Office

Currently, Environmental Restoration Program activities at the DOE Albuquerque Field Office consist of the Environmental Restoration Remedial Action Program, the Decontamination and Decommissioning Program, the Uranium Mill Tailings Remedial Action (UMTRA) Surface Water and Groundwater Projects, the Grand Junction Projects Office Remedial Action Project, and the Monticello Remedial Action and Vicinity Properties Project.

The primary objective of the DOE Albuquerque Field Office Environmental Restoration Program is to identify and restore inactive release sites at its installations, which consist of four weapons production plants and four laboratory facilities. The production plants are the Kansas City Plant, the Mound Plant, the Pantex Plant, and the Pinellas Plant. Sandia National Laboratories–Albuquerque, Sandia National Laboratories–Livermore, Los Alamos National Laboratory, and the Inhalation Toxicology Research Institute are the laboratories. In addition, DOE is a potentially responsible party at the South Valley Site, which is on the EPA National Priorities List for cleanup. To date, more than 2000 potential release sites across the DOE Albuquerque Field Office complex have been identified as needing further assessment and/or cleanup. In addition, 22 surplus facilities are included in the decontamination and decommissioning program for surveillance and maintenance or final decommissioning.

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 5000 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. Similarly, the purpose of the UMTRA Groundwater Project is to restore, as necessary, the groundwater at the 24 designated UMTRA Project processing sites to ensure compliance with EPA groundwater protection standards. The Grand Junction Projects Office Remedial Action Project involves the cleanup of 311,000 tons of uranium-mill-tailing-contaminated soils and structures within its complex. The Monticello Remedial Action and Vicinity Properties Project entails the remediation of 1.5 million cubic yards of contaminated soil from

adjacent peripheral properties and 0.1 million cubic yards of contaminated material from vicinity properties in the town of Monticello, Utah. The Monticello Remedial Action and Vicinity Properties Project is subject to CERCLA regulatory requirements and has been included on EPA's National Priorities List for site cleanup.

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 uranium mill tailings constitute a recognized source of environmental harm and risk to human health and safety 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 possible toxic and cancer-causing agents.

DOE Nevada Field Office

The DOE Nevada Field Office operates the Nevada Test Site (including historical test areas on the Tonopah Test Range and Nellis Air Force Range) and eight off-site areas in Nevada and four other States. Each of these sites was used primarily for testing nuclear explosive devices or their effects. Since 1973, all testing has been limited to the Nevada Test Site, which has been used for approximately 720 nuclear tests consisting of aboveground (until 1963) and underground tests. In addition to the radioactivity produced during a nuclear test, operation of decontamination equipment and test facilities has generated hazardous, radioactive, and mixed wastes. A total of approximately 1100 individual release sites will be addressed as part of the DOE Nevada Field Office Environmental Restoration Program.

The eight off-site test areas are the Central Nevada Test Site and Project Shoal Site in Nevada; Amchitka Island, Alaska; the Rio Blanco and Rulison gas reservoir test sites in Colorado and the Gasbuggy site in New Mexico; the Gnome-Coach experiment sites in New Mexico; and the Tatum Dome Test Site in Mississippi.

No off-site risks to public health or the environment are believed to be present as a result of the activities being conducted at the Nevada Test Site. The remoteness of the site and the rigidly controlled access prevent inadvertent public exposure. The DOE Nevada Field Office has taken special precautions to reduce risks to worker populations, and the potential for off-site migration of contamination, although considered negligible, will be thoroughly evaluated as part of the Environmental Restoration Program.

Rocky Flats Office

The Rocky Flats Office is a nuclear weapons manufacturing facility that covers approximately 7000 acres, of which 350 acres are used for actual operations. Both radioactive and nonradioactive wastes have been generated at the Rocky Flats Office in the nuclear weapons production process. Past production activities have included component fabrication from plutonium, uranium, and nonradioactive metals, as well as recovering nuclear components from obsolete weapons. The Rocky Flats Office was placed on the National Priorities List in October 1989. Preliminary assessments under the Rocky Flats Office Environmental Restoration Program have identified 178 individual hazardous substance sites as possibly requiring cleanup. The Interagency Agreement among DOE, EPA, and the Colorado Department of Health has grouped the 178 individual hazardous substance sites into 16 operable units. DOE has agreed to fund a variety of on-site and off-site projects designed to protect the water supplies of municipalities near the Rocky Flats Office from potentially contaminated runoff originating at the facility.

No immediate health risks have been identified based on information available to date. However, health risks are not fully quantified and are pending data analysis from ongoing background characterization programs and site-specific risk assessments.

Present concerns center on the migration of groundwater contaminated with volatile organic compounds. At present, this contamination has not breached the Rocky Flats Plant boundary, and three interim remedial actions are under way to capture and minimize groundwater and surface-water migration from contaminated areas.

FY 1992 Major Accomplishments

DOE Albuquerque Field Office

FY 1992 major accomplishments for the DOE Albuquerque Field Office are as follows:

- initiated remediation of the Abandoned Indian Creek Outfall at the Kansas City Plant;
- completed decontamination and decommissioning of the plutonium processing building at the Mound Plant;
- completed sludge holding tank RCRA closure at the Pinellas Plant;
- planned to continue work on the fuel oil spill bioremediation field studies at the Sandia National Laboratories–Livermore as noted in the FY 1993–1997 Five-Year Plan;
- initiated UMTRA surface remediation at Ambrosia Lake, New Mexico; Falls City, Texas; and Gunnison and Rifle, Colorado; and resumed remediation at Monument Valley, Arizona;
- completed surface remediation at the Lowman, Idaho, UMTRA site;
- completed 60 vicinity property remediations and the mill site preparation and preexcavation designs for the Monticello Remedial Action and Vicinity Properties Project; and
- continued hauling of tailings and other contaminated materials from the Grand Junction Projects Office property as part of the Grand Junction Projects Office Remedial Action Project.

DOE Nevada Field Office

FY 1992 major accomplishments for the DOE Nevada Field Office are as follows:

- completed first groundwater characterization project groundwater well primarily for purposes of technological evaluation;
- remediated underground storage tanks;
- began closure of one RCRA site and submitted closure plans for several other sites to State, with monitoring stations installed at several active RCRA sites;
- completed selection of environmental support services contractor for the Environmental Restoration Program;
- completed rescoring of the Nevada Test Site using revised Hazard Ranking System and submitted documentation to EPA;
- revised Tatum Dome Remedial Investigation/ Feasibility Study Work Plan and submitted plan to State of Mississippi for comment.

Rocky Flats Office

FY 1992 major accomplishments for the Rocky Flats Office areas are as follows:

- contaminated-groundwater interceptor system and the treatment system for the Interim Remedial Action at 881 Hillside (Operable Unit 1);
- completed field treatability system installation and began treatability testing at 903 Pad, Mound, and East Trenches (Operable Unit 2); continued Secretary of Energy initiative for further safeguard of drinking water supplies for communities in the vicinity of Rocky Flats, including the diversion of plant runoff around a public water supply reservoir and funding a replacement water source;
- finalized RCRA Facility Investigation work plans for Woman Creek (Operable Unit 5), Walnut Creek (Operable Unit 6), and the Present Landfill (Operable Unit 7); developed work plans for all remaining operable units;
- began pond sludge removal and solidification from the Solar Evaporation Ponds (Operable Unit 4); and
- began fieldwork activities on Operable Unit 3 (off-site areas).

FY 1993 and Outyear Major Milestones

DOE Albuquerque Field Office

The DOE Albuquerque Field Office is continuing its commitment to the assessment and cleanup of inactive waste management units and facilities and has established many outyear cleanup milestones.

These milestones include implementation of several interim corrective measures and completion of the Remedial Action Plan for the 4.5-acre site at the Pinellas Plant. Similarly, the Pinellas Plant will complete all assessment activities by FY 1994, and remedial actions for sources of contamination will continue through FY 1998.

In FY 1993, activities at the Pantex Plant will focus on assessment fieldwork, with interim or final cleanups scheduled to begin in FY 1994–1998.

At the Mound Plant, three facilities are planned for decommissioning in FY 1993, with two additional areas scheduled for completion by FY 1996. By FY 1998, the Mound Plant projects that assessments for five operable units will be completed. Current projections show that 56 percent of the known radioactive soils will be remediated, and 78 percent of the surplus buildings will be decommissioned by FY 1998.

The Kansas City Plant expects to complete assessments in two areas in FY 1994, with five additional areas scheduled for completion in FY 1995 and FY 1996. Cleanup of the Abandoned Indian Creek Outfall is scheduled for completion in FY 1994, and three additional cleanups are expected to be completed in FY 1997 at the Kansas City Plant.

Both Sandia National Laboratories–Albuquerque and Sandia National Laboratories–Livermore will have Hazardous and Solid Waste Amendments Permits in place by FY 1998. The Los Alamos National Laboratory will have all Environmental Restoration Program work plans in place by FY 1998.

All restoration activities associated with the Grand Junction Projects Office Remedial Action Project will be completed in FY 1993.

With regard to the Monticello project, 120 vicinity property remediations will be completed in FY 1993. The mill site preparation and preexcavation work will be completed, and the repository design for the Monticello project will be completed. From FY 1994 to FY 1998, tailings disposal for the Monticello mill site and vicinity properties will be

completed, and downstream surface water and groundwater contamination remedial investigation activities will commence for the final phase of cleanup.

As stated in the FY 1993–1997 Five-Year Plan, the Programmatic Environmental Impact Statement will be completed in FY 1993 for the UMTRA Groundwater Project. Two groundwater assessments will be initiated at priority sites identified under the UMTRA Groundwater Project in FY 1994. Six additional site assessments will begin in FY 1998.

DOE Nevada Field Office

The DOE Nevada Field Office expects to complete eight new wells for the Nevada Test Site Groundwater Characterization Project in FY 1993. Work plans for the Nevada Test Site Sumps and Injection Well Remedial Investigation/Feasibility Study, Contaminated Wastes Sites Remedial Investigation/Feasibility Study, and Inactive Muckpile and Tunnel Ponds Remedial Investigation/ Feasibility Study will be completed. Similarly, the Remedial Investigation field investigations for inactive tanks will be completed.

RCRA closure activities will be completed for the Nevada Test Site Area 6 Steam Cleaning Effluent Ponds Facility and the Area 2 Shop and Well Closure. Data analysis activities and required reports will be developed for the Contaminated Sumps and Pits, and investigations associated with the Abandoned Septic Tanks will be completed.

The DOE Nevada Field Office outyear activities include negotiation of an Interagency Agreement with the State of Nevada and EPA Region IX. Other Nevada Test Site activities include completion of all RCRA closure plans by FY 1995, completion of RCRA closure plan implementation by FY 1997, and installation of 66 groundwater characterization wells and completion of CERCLA assessments for four site restoration categories in FY 1998.

Outyear activities for off-site (non-Nevada Test Site) locations include completion of the Tatum Dome Site Assessment in FY 1995; completion of the Rulison Site Assessment in FY 1997; completion on the Gnome-Coach Site Assessment in FY 1997; completion of the Central Nevada Test Site Assessment in FY 1998; and completion of the Amchitka Island Site Assessment in FY 1998. The remedial activities at the Tatum Dome Site are scheduled for completion in FY 1998.

DOE Rocky Flats Office

Remedial activities associated with the Solar Evaporation Ponds (Operable Unit 4) will be completed in FY 1993. These activities include removal, solidification, and packaging of material for off-site disposal.

Final cleanup actions for Operable Units 1 and 2 are scheduled to begin in FY 1996 and FY 1997, respectively. Interim Remedial Actions will continue at Operable Units 1 and 2 as Remedial Investigation/Feasibility Study assessment fieldwork activities were completed in FY 1992.

The DOE Rocky Flats Office will continue to support the surface water management projects necessary to protect downstream drinking water supplies.

Issues and Strategies

DOE Albuquerque Field Office

- The Los Alamos National Laboratory Hazardous and Solid Waste Amendments Permit will require modification to include all of the 2350 known or potential release sites.
- EPA has proposed that the Pantex Plant be added to the National Priorities List based on Hazard Ranking System scoring performed by EPA. Currently, the Pantex Plant is not listed on the National Priorities List. EPA is reviewing the

results of an independent Hazard Ranking System scoring analysis provided by the Pantex Plant.

- The heavily populated area around the Pinellas Plant makes potential release of contaminants to the groundwater of utmost concern.
- The Sandia National Laboratories–Albuquerque has identified 192 potential release sites that may require remedial action.
- Bioremediation, an innovative technology, is being implemented at the Fuel Oil Spill Site at the Sandia National Laboratories–Livermore.
- A total of 41 disputed properties involving contamination, which may not have originated at the Monticello mill site, are under consideration for inclusion and eventual remediation.
- Removal of contaminated materials by the Grand Junction Projects Office Remedial Action Project must be completed before closure of the Cheney Repository in June 1993.
- A class action lawsuit alleging damages from wind-borne and waterborne contamination from Mound Plant has been filed against the subcontractor and Monsanto Research Corporation by 33 people residing in Montgomery County, Ohio.

DOE Nevada Field Office

- An agreement between DOE and the U.S. Air Force will need to be negotiated regarding DOE access to sensitive areas on Nellis Air Force Range to clean up plutonium-contaminated soil.
- The application of conventional remedial actions that are widely used at contaminated waste disposal sites may not be feasible at the Nevada Test Site because of the unique nature of the waste and releases and the depth of contamination from underground nuclear testing.

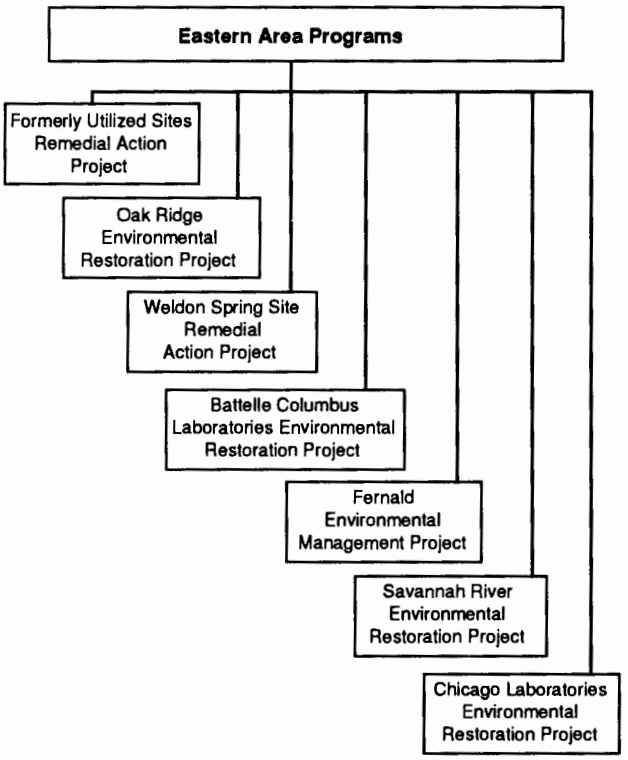
DOE Rocky Flats Office

- The State of Nevada has expressed objection to additional shipment of wastes to the Nevada Test Site until issues identified by the State have been resolved. This situation could delay pondcrete shipments and affect Interagency Agreement milestones.
- Levels of radionuclides and metals to be achieved through final cleanup actions have not been defined, resulting in considerable technical and financial uncertainty.

2.2.6 EASTERN AREA PROGRAMS

This year's accomplishments within the Eastern Area Programs demonstrate significant progress toward the overall mission of planning, investigating, and executing the remediation of inactive sites.

The Eastern Area Programs include DOE, contractor-owned, and privately owned sites and facilities located in 12 States. The environmental restoration efforts at the sites and facilities have been designated as seven separate projects as shown below.



DOE Oak Ridge Field Office

Remedial actions and decontamination and decommissioning are conducted at six DOE-owned installations located in four States. These installations include the Oak Ridge Reservation, composed of the Oak Ridge K-25 Site, the Oak Ridge Y-12 Plant, and the Oak Ridge National Laboratory, in Tennessee; the Paducah Gaseous Diffusion Plant in Kentucky; the Portsmouth Gaseous Diffusion Plant in Ohio; and the Weldon Spring Site in Missouri. All of these installations, except Paducah and Portsmouth, are on EPA's National Priorities List.

Weldon Spring Site

The Weldon Spring Site, a 229-acre site located about 30 miles west of St. Louis, Missouri, was used by the Army as an ordnance works in the 1940s, and then in the 1950s and 1960s the Atomic Energy Commission used Weldon Spring for processing uranium and thorium. DOE is conducting a comprehensive remedial action program, including long-term management of radiological waste.

Areas to be remediated include the following:

- Quarry–Nine-acre site containing 126,630 cubic yards of radiologically contaminated soil and rubble and three million gallons of radiologically or chemically contaminated water.
- Raffinate Pits–Four waste lagoons, containing 407,930 cubic yards of raffinate sludges/soil and 57 million gallons of radiologically or chemically contaminated water.
- Chemical Plant–44 buildings and other structures and 347,996 cubic yards of contaminated soil and building material.
- Vicinity Properties–approximately 125,250 cubic yards of contaminated soil.
- Groundwater–nitroaromatic and radiologically contaminated groundwater at the Quarry and Chemical Plant.

Fernald Environmental Management Project

The Fernald Environmental Management Project (FEMP) is located near Fernald, Ohio, approximately 17 miles northwest of Cincinnati. Its mission has shifted from the production of uranium metal to environmental restoration. Cleanup of the 1050-acre site and the support of waste management and base services now constitute the major site activities. FEMP was placed on the National Priorities List in November 1989, and site cleanup is being conducted under CERCLA. Several regulatory agreements are in effect at the site, including the Amended Consent Agreement between DOE and EPA, the Consent Decree and proposed amendments between DOE and the State of Ohio, and the Federal Facilities Agreement for Radon Emissions between DOE and EPA. Cleanup at the Reactive Metals Incorporated extrusion plant in Ashtabula, Ohio, is also being performed under FEMP management oversight.

Formerly Utilized Sites Remedial Action Program

The Formerly Utilized Sites Remedial Action Program (FUSRAP) presently includes 33 sites in 13 States. Of these, 28 are Manhattan Engineer District or Atomic Energy Commission 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 EPA's National Priorities List.

The objectives of FUSRAP are to identify and assess all sites formerly used to support early Manhattan Engineer District/Atomic Energy Commission nuclear work to determine whether further decontamination or control is needed; decontaminate or apply controls to these and other program sites to permit conformance with current applicable guidelines; and dispose of or stabilize all generated residues in a radiologically and environmentally acceptable manner.

DOE Savannah River Field Office

The Savannah River Site (SRS), managed by the DOE Savannah River Field Office, is located on 192,000 acres along the Savannah River near Aiken, South Carolina. Production of nuclear materials at SRS has resulted in the generation of by-products such as high-level liquid waste, solid transuranic waste, and low-level waste, as well as hazardous mixed waste. The migration of contaminants from basins, pits, waste piles, burial grounds, and underground storage tanks has resulted in soil and groundwater contamination in several locations at the site.

SRS has an active Environmental Restoration Program focusing on compliance with environmental regulations and cleanup of contaminated sites through remedial actions and decontamination and decommissioning. The primary regulatory drivers at SRS are RCRA, CERCLA, and Consent Orders and Settlement Agreements. Many waste sites at SRS have undergone RCRA closures, and other sites are undergoing RCRA Facility Investigations. In addition, waste units are being evaluated to determine whether they fall under the purview of CERCLA. The pending CERCLA Interagency Agreement will integrate CERCLA and RCRA requirements.

DOE Chicago Field Office

The DOE Chicago Field Office (CH) provides integrated management of a number of installations and also performs a variety of additional assignments in support of the Environmental Restoration Program. Environmental compliance activities addressed by CH reflect the research and development nature of the work at CH installations. The primary CH environmental activities are related to decontamination and decommissioning of old nuclear facilities; characterization and potential remediation of possible contamination to soil and groundwater; and technical support to CH's Environmental Restoration Programs at Headquarters and at other Field Offices.

Seven component installations report to CH: Ames National Laboratory, Argonne National Laboratory–East, Argonne National Laboratory–West, Battelle Columbus Laboratories, Brookhaven National Laboratory, Fermi National Accelerator Laboratory, and Princeton Plasma Physics Laboratory. Also, CH is responsible for three inactive decommissioned sites: the Piqua Nuclear Power Facility, the Hallam Nuclear Power Facility, and Site A/Plot M. Additionally, CH will be responsible for the Separations Process Research Unit, located at the Knolls Atomic Power Laboratory near Schenectady, New York. This facility will soon be transferred into the decontamination and decommissioning program from the DOE Office of Naval Reactors.

Accomplishments

DOE Oak Ridge Field Office

In addition to the continuing investigations to identify and characterize areas of contamination at the DOE Oak Ridge Field Office installations, there have been significant accomplishments in the Environmental Restoration Program. A Federal Facilities Agreement for the Oak Ridge Reservation has been executed, health-based cleanup levels have been established, and the Groundwater Program Summary Plan has been completed. The RCRA Facility Investigation Report for Waste Area Group 6 at Oak Ridge National Laboratory and the Phase II Site Investigation and Alternative Evaluation Report for Paducah Gaseous Diffusion Plant have been completed, and the Chemical Plant Site Remedial Investigation/Feasibility Study (RI/FS) documents for Portsmouth Gaseous Diffusion Plant have been issued for public review. Interim Remedial Measures have been completed for two sites at Oak Ridge National Laboratory and one site at Portsmouth Gaseous Diffusion Plant. RCRA closures were completed at Portsmouth Gaseous Diffusion Plant and Oak Ridge National Laboratory. Two interim Records of Decision (for the Y-12 plant and K-25 Site) and the final Record of Decision for the United Nuclear Corporation Disposal Site were signed.

Weldon Spring Site

For the Quarry Bulk Waste Removal Operable Unit, the Record of Decision was signed in March 1991 by EPA and DOE, and the Haul Road for Quarry Bulk waste removal was completed. At the Chemical Plant Site, five buildings were dismantled, and Phase I of the Materials Staging Area was completed. In addition, construction started for the water treatment plants at both the Quarry and the Chemical Plant.

Fernald Environmental Management Project

Several recent accomplishments at Fernald represent significant progress toward cleanup of the site. Negotiations were completed for an amended Consent Agreement with EPA under CERCLA, Sections 120 (Federal Facilities) and 106(a) (Abatement Action), in FY 1991. The scope and schedule for completion of RI/FS milestones were revised in the amended Consent Agreement. A total of 27 removal actions have been identified. Seven of these removal actions have been completed, and work is proceeding on or ahead of schedule for the remaining removal actions. In FY 1991, Fernald shipped 43,500 drum equivalents of low-level waste to the Nevada Test Site. This exceeded the Fernald goal of 37,000 drum equivalents. An additional 101,000 drum equivalents of low-level waste were shipped in FY 1992, which exceeded the FY 1992 goal of 100,000 drum equivalents. Fernald completed all Consent Decree milestones on schedule. Fernald completed ten RCRA Proposed Amended Consent Decree milestones on schedule. This included submitting revised RCRA Part A and Part B Permit Applications, submitting three required technical reports and plans, moving stored materials under cover from open storage pads, and completing waste characterization efforts.

Finally, Fernald completed the identified action in the Federal Facilities Agreement for Radon Emissions.

Formerly Utilized Sites Remedial Action Program

Remedial action was completed at the Albany Research Center in March 1991 and in two of three warehouses at Baker and Williams in New York in July 1991. Remedial action was also completed in January 1992 at the Elza Gate Site in Oak Ridge, Tennessee. Three Federal Facilities Agreements were negotiated with EPA for the St. Louis, Missouri; Maywood, New Jersey; and Wayne, New Jersey, sites. RI work for the Maywood and Wayne, New Jersey, sites was completed.

Savannah River Site

During the past year, DOE submitted to EPA 38 work plans and revisions and seven closure plans and revisions on or ahead of schedule. DOE made an effort to streamline the regulatory review process for SRS facilities, which resulted in a savings of $3 million on CERCLA sites.

Some of the specific accomplishments at CERCLA/ RCRA sites include removal of more than 250,000 pounds of organics from more than one billion gallons of treated water at the A/M Area Groundwater site. In addition, DOE performed ground-penetrating radar and soil-gas characterization at 40 CERCLA sites and soil and groundwater sampling at eight RCRA sites. Several major closures were completed, including the Mixed Waste Management Facility, the M-Area Settling Basin, F/H Areas Seepage Basins, and the 105-C Process Tank.

In the decontamination and decommissioning program, SRS completed a decontamination and decommissioning program needs assessment document, initiated a sitewide survey to assess contamination, prepared a site decontamination and decommissioning Program Plan, and submitted five applications for acceptance to initiate decontamination and decommissioning at SRS facilities.

DOE Chicago Field Office

Many of CH accomplishments in FY 1992 were associated with the initiation or completion of site assessments regarding potential environmental releases and their risks. The major CH FY 1992 accomplishments are as follows:

- At Argonne National Laboratory–East, the 800-Area landfill groundwater report and RI/FS work plan were completed; shipment of Phase II decontamination and decommissioning wastes (reactor systems) and preparation for Phase III (reactor vessel internals) for the Experimental Boiling Water Reactor project were completed. Also, procurement for an RI subcontractor to provide preliminary site assessment services for the 317/319/ENE area and the preliminary site assessment fieldwork for the 100 Area continued.
- At Argonne National Laboratory–West, the cleanup of an historical polychlorinated biphenyl spill was completed.
- At Brookhaven National Laboratory, DOE, EPA, and the State of New York signed an Interagency Agreement for cleanup activities, and several documents under this Interagency Agreement have been approved and completed. Brookhaven National Laboratory also completed a pilot study at the Hazardous Waste Management Spray Aeration Site to document and evaluate the performance of a spray aeration system for removal of volatile organic compounds from groundwater in the southeast portion of the site.
- Battelle Columbus Laboratories completed the decontamination and decommissioning of Building (King Avenue–A).
- Princeton Plasma Physics Laboratory developed a baseline for environmental restoration and funded a CERCLA inventory survey.

Milestones

DOE Oak Ridge Field Office

Several significant environmental restoration milestones are scheduled from FY 1993 through FY 1998. The K-25 Site will implement the Environmental Restoration Information System in FY 1994. At Oak Ridge National Laboratory, the Waste Area Group 6 closure will be completed in FY 1997, and Interim Corrective Measures will be completed at three sites, one in FY 1997 and two in FY 1998. The Y-12 Plant will complete the RCRA closures in FY 1993 and will obtain Records of Decision for three sites in FY 1993, FY 1996, and FY 1997. Completion of the Corrective Measures Implementation Program Plan and quadrant-specific work plans for Portsmouth will occur in FY 1994. The RCRA Facility Investigation at Paducah will be completed during FY 1997.

Weldon Spring Site

The Record of Decision for the Chemical Plant operable unit is expected to be signed in June 1993, and the Record of Decision for the Quarry Residuals operable unit is expected to be signed in FY 1998. The Quarry and Site Water Treatment Plants are expected to begin operations in FY 1993. The removal of Quarry Bulk Waste will begin in late FY 1992 and is expected to be completed in FY 1995. The dismantling of 31 chemical plant buildings will be completed in FY 1994, and the remediation of four Raffinate Pits will begin in FY 1995. The remediation of the Army and Busch Vicinity Properties is expected to be completed in FY 1997.

Fernald Environmental Management Project

Fernald will have a number of significant accomplishments from FY 1993 through FY 1998. Specifically, all five operable units will have submitted RI/FS reports to support the five respective Records of Decision issued in FYs 1994, 1995, and 1997. Cleanup work is scheduled to be initiated on four of the operable units in FY 1995, 1996, and 1997. The safe shutdown removal action is scheduled to be completed in FY 1994. RCRA closure actions, initiated in FY 1992, will continue through this period, with actions integrated with the CERCLA cleanup efforts. The Advanced Wastewater Treatment facility is scheduled to be operational in FY 1994.

Formerly Utilized Sites Remedial Action Program

The Records of Decision for Tonawanda and Colonie, New York, sites are expected to be signed in FY 1993. DOE would then complete the remedial actions for these sites. DOE expects to publish Records of Decision for the Maywood and Wayne, New Jersey, sites in FYs 1994 and 1995, respectively. Publication of the Record of Decision for the St. Louis, Missouri, sites, is expected in FY 1995.

Savannah River Site

A key milestone for FY 1992 at SRS is executing the Federal Facilities Agreement for the CERCLA Waste Site Investigation/Remediation, anticipated during the fourth quarter.

In FY 1993, one of the key milestones is submission of a closure plan for the Low-Level Waste Burial Ground. Closure of the New TNX Seepage Basin is anticipated during the first quarter of FY 1994.

Two significant milestones during FY 1995 are the closure of the Savannah River Laboratory Seepage Basins and the initiation of construction for F&H-Area groundwater remediation, both during the third quarter.

In FY 1996, SRS anticipates completion of the Separation Equipment Development decontamination and decommissioning and submission of the closure plan for the currently operated sanitary landfill, both during the first quarter.

DOE Chicago Field Office

While many remedial actions at CH installations will be completed by FY 1998, many of the decontamination and decommissioning activities are not scheduled until well after FY 1998. Major milestones that are anticipated to occur through FY 1998 follow:

At Argonne National Laboratory–West, an Environmental Assessment will be completed in FY 1993.

At Brookhaven National Laboratory, an Engineering Evaluation/Cost Analysis for the Cesspool Removal project will be submitted to regulators, and the "D" Tank Removal will be initiated in FY 1993; the RI/FS Work Plan for Operable Units I and VI will be submitted to regulators in FY 1993.

At Argonne National Laboratory–East, the 317/319 area RI/FS will be completed in FY 1994.

At Argonne National Laboratory–West, decontamination and decommissioning of the Chemical Liquid Processing Area will be completed in FY 1994.

At Ames Laboratory, the Chemical Disposal Site Characterization and the removal of contaminated soil at the underground storage tanks will be completed in FY 1994.

At Battelle Columbus Laboratories, completion is expected for the decontamination and decommissioning of Building KA-3 in FY 1993, Building KA-6 in FY 1994, Building KA-5 in FY 1995, and Buildings KA-4 and KA-1 in FY 1996.

Issues and Strategies

DOE Oak Ridge Field Office

Although the present risks to human health and safety and the environment are generally low at the Oak Ridge sites, the potential for groundwater contamination and extended exposure to hazardous materials must be addressed in a timely manner. Activities must include not only identification and characterization of the existing contaminated areas but also resolution of associated issues, such as long-term storage strategies.

The Oak Ridge sites will expeditiously pursue the evaluation and characterization of both known and suspected areas of contamination at the various sites in accordance with RCRA, CERCLA, Federal Facilities Agreements, and other existing or future agreements and orders. Interim Corrective Measures will be implemented when the need to take immediate action is identified. The Oak Ridge sites will develop and implement the most cost-effective remedial actions practicable, which will eliminate or reduce to acceptable levels the risk to human health, safety, and the environment.

Fernald Environmental Management Project

Two major issues affect the ability of FEMP to perform cleanup activities:

- Completion of the RI/FS and meeting all regulatory milestones will require increased staffing. FEMP procured an Environmental Restoration Management Contractor with expertise to effectively manage the site cleanup and execute a smooth transition from current to new contractors.
- Integration of CERCLA and RCRA requirements and National Environmental Policy Act values is essential to cleanup progress. FEMP is preparing required CERCLA documentation that meets the requirements of RCRA and the National Environmental Policy Act.

Formerly Utilized Sites Remedial Action Program

Several major issues affect FUSRAP:

- FUSRAP is working toward development of waste management alternatives through the RI/FS process for those wastes in New York, New Jersey and Missouri. Among the alternatives is the identification of permanent disposal sites for low-level radioactive and mixed wastes.
- Local political resistance has stopped plans for interim remedial action activities at selected residential and commercial properties in New Jersey and Missouri. A community relations program has been implemented to educate the public on the benefits of mutual cooperation between municipalities and the Federal Government. The cleanup process must not be politically controlled but must be a joint effort between municipalities and the Government for the benefit of the public.
- Federal Facilities Agreements require aggressive compliance schedules for conducting the RI/FS environmental review. Continuous management attention is necessary to meet the tight schedules established by Federal Facilities Agreements.

Savannah River Site

DOE is working at SRS to develop cost effective, technically suitable institutional controls/strategies that will be accepted by regulatory agencies. SRS has proposed a phased multi-technology approach to groundwater remediation at the F/H Areas as part of an integrated RCRA/CERCLA comprehensive strategy for the entire General Separations Area.

One of the greatest concerns at SRS this year is that further delays in signing and finalizing the SRS Federal Facilities Agreement will impact regulatory document review, particularly in meeting negotiated schedules.

Weldon Spring Site

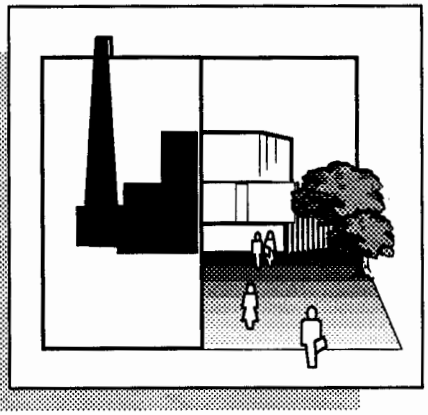
The Weldon Spring Site Remedial Action Program (WSSRAP) could be delayed because of litigation regarding final waste treatment and/or disposal decisions. In addition, there is some concern that the Programmatic Environmental Impact Statement could impact the schedule for the WSSRAP site-specific remedial action decisions. Significant concern exists regarding the ability of DOE, EPA, and the State of Missouri to review and approve the Site Feasibility Study/Preliminary Environmental Impact Statement by May 1993.

DOE Chicago Field Office

Many complex and diverse Federal, State, and local laws and regulations affect CH and its installations in performing business through the Environmental Restoration Program.

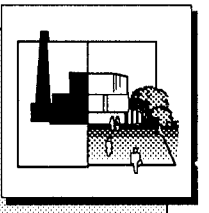
Many of the CH issues and strategies are common throughout the Environmental Restoration Program. Two key CH issues are as follows:

- At the Princeton Plasma Physics Laboratory, the potential exists for further migration of chlorinated solvents in the groundwater.
- At Battelle Columbus Laboratories, the inability to ship transuranic waste off-site is causing schedule delays in the initiation of hot cell decontamination and the completion of this project. The Nuclear Regulatory Commission may take action if the baseline schedule for decontamination and decommissioning activities is significantly delayed.



Facility Transition and Management

2.3.0 PROGRAM OVERVIEW: FACILITY TRANSITION AND MANAGEMENT



EM has established a comprehensive program to plan and implement the transfer of facilities that are surplus to the other DOE operating programs for final disposition.

DOE has numerous facilities at sites across the country that support active operating programs within the Offices of Nuclear Energy, Defense Programs, and Energy Research. When these programs complete or terminate their missions, the associated facilities are identified as surplus and shut down. Since many of these facilities are contaminated with hazardous and/or radioactive materials resulting from previous operations, special controls and monitoring requirements are necessary during and following facility shutdown to ensure public health and safety and to protect the environment.

One of EM's primary goals is to ensure that the risks to human health and safety and to the environment posed by inactive and surplus facilities are either eliminated or reduced to prescribed, acceptable levels. To help achieve this goal, EM is responsible for ensuring that facilities are brought to a deactivated state, are properly maintained, and are eventually decontaminated and/or decommissioned, or released for other uses. DOE offices can transfer surplus facilities to EM for final disposition using a formalized transfer protocol.

DOE has proposed a significant restructuring of the nuclear weapons complex over the next 20 to 30 years with the goal of achieving a smaller, more efficient and cost-effective production capability. As a result, a number of DOE sites may be shut down or "downsized" as previous nuclear and nonnuclear operations are terminated or consolidated at other sites.

Identification of Near-Term Facility Shutdowns

In late 1991, the President announced a significant reduction in the Nation's nuclear weapons stockpile, largely as a result of the changes in the former Soviet Union and the subsequent end to the Cold War. The President's initiative provided a window of opportunity to accelerate the consolidation of the nonnuclear component manufacturing activities during a period of low production without impacting national security, to more quickly achieve a smaller, more cost-effective nuclear weapons production complex. The Secretary of Energy, as a result, proposed acceleration of plans to consolidate most nonnuclear work and identified the Kansas City Plant as the preferred consolidation site. Under this proposal, Defense Programs activities at the Mound and Pinellas Plants would cease. Defense Programs is currently preparing an Environmental Assessment to analyze the environmental impacts associated with this proposal. This analysis is expected to be completed in early 1993.

The Department is also preparing the Nuclear Weapons Complex Reconfiguration Programmatic Environmental Impact Statement to assist in the DOE decision-making process regarding long-range planning. This analysis may support further consolidation of defense program activities and thereby place additional responsibilities on EM for transition and deactivation.

Need for Effective Facility Transition

Production missions at several DOE sites have been canceled. The affected production facilities were shut down and subsequently transferred to EM for final disposition. Specific examples include the Fernald Environmental Management Project and the Hanford Site. The relatively short transition planning period prior to the transfer of the facilities contributed to later problems for EM. EM needed to reallocate and reprogram large amounts of funding to

support unplanned and unbudgeted facility deactivation actions to correct deficiencies found in the transferred facilities. The Oak Ridge K-25 Site (formerly known as the Oak Ridge Gaseous Diffusion Plant) was also recently transferred to EM prior to completion of facility shutdown actions. The EM organization had to assume the unplanned resource burden associated with facility deactivation activities before beginning planned decontamination and dismantlement work.

Establishment of the Office of Facility Transition and Management

In view of the past problems associated with facility transfers and the fact that a large number of similar facilities are expected to come to EM for final disposition in the future, the Office of Facility Transition and Management was established within EM to develop and institutionalize a Departmental process for the timely and effective transfer of surplus facilities and to implement that process in transitioning surplus facilities to EM for final disposition (Figure 2.3.0). Three site-specific working groups have been established within the transition office to develop and implement site-specific plans for transitioning the respective sites to EM. These groups were established in light of the downsizing activities anticipated at the Rocky Flats Plant, and possibly other Defense sites, such as the Mound and Pinellas Plants, in the near-term, and their change in site missions from a once production-dominated mode to a cleanup-dominated mode.

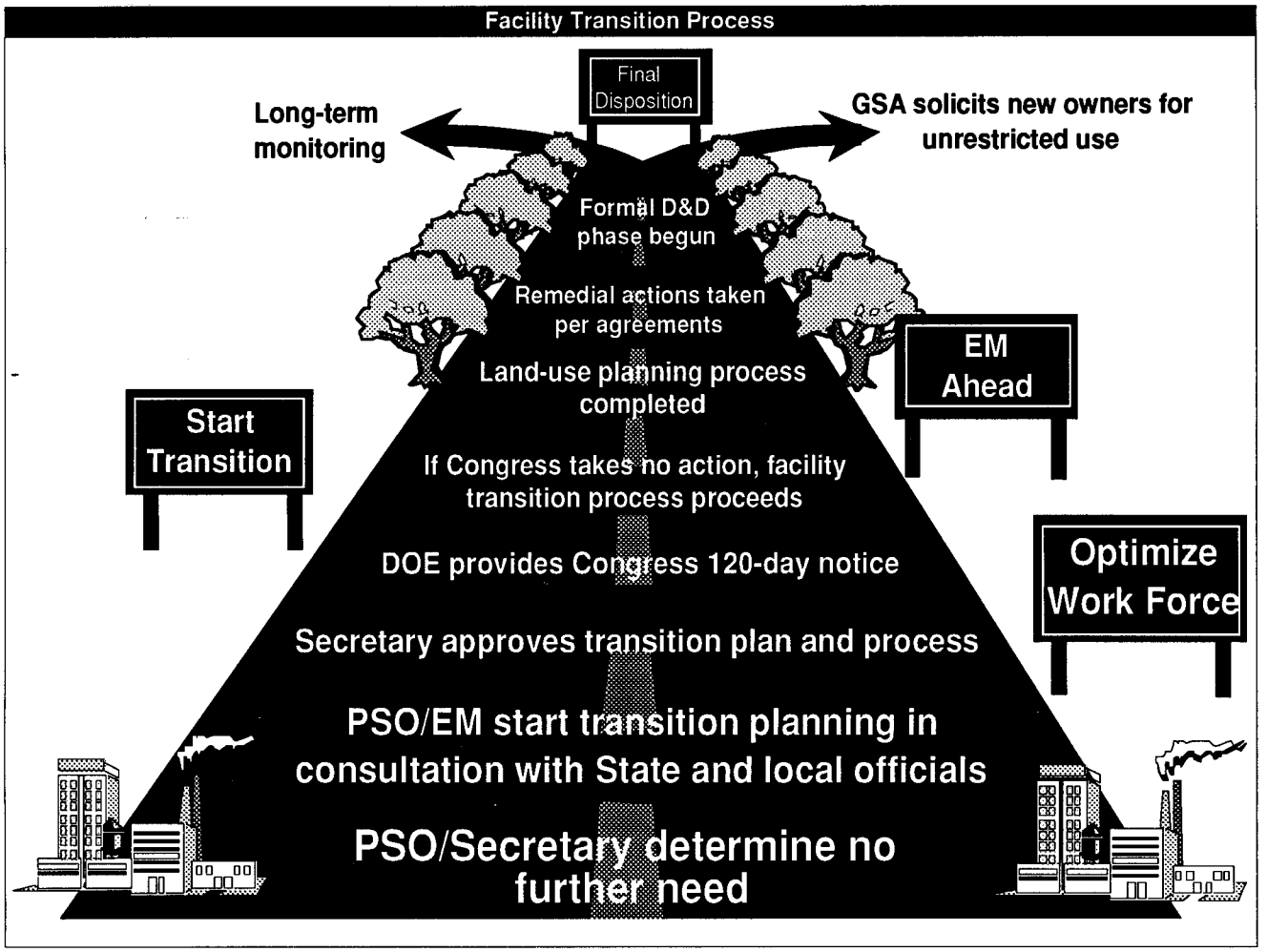
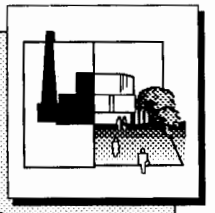


Figure 2.3.0.

2.3.1 SYSTEMS INTEGRATION APPROACH TO FACILITY TRANSITION AND MANAGEMENT



A systems approach will be used to ensure the timely and cost-effective transition of surplus facilities from DOE operating programs to EM for final disposition.

In developing a systems approach for surplus facility transition, the newly established Office of Facility Transition and Management will focus on the following objectives: (1) establishing a list of candidate DOE facilities expected to be assigned to EM in the future, (2) assessing the condition of the candidate facilities to determine the priority and extent of required transition actions, (3) developing an accepted transfer protocol, (4) developing formalized plans for transitioning affected facilities/ sites to EM, and (5) developing site-specific mission plans for all DOE sites supporting EM missions.

These near-term planning actions will aid in reducing the time and cost associated with facility transition activities. Additionally, as a separate EM program element, the facility transition activities are a visible part of the EM budget and can be tracked to provide a measure of DOE's future legacy as obsolete facilities are shut down.

The Transition Process

DOE has defined the transition process as "the range of activities associated with the transfer of responsibility for a DOE surplus contaminated facility from the operating Program Secretarial Officer to EM. The transition process involves the development of a transition plan, the deactivation and preliminary characterization of the facility, evaluation of the facility against the turnover requirements, preparation of the initial EM budget requests, and other necessary planning and information exchange activities. Transition begins when an operating facility is formally declared surplus and ends when responsibility for the facility is formally turned over to EM."

The transition process includes the following:

- Identification and declaration by the operating program that a facility is surplus to their operating mission. To be declared surplus, the facility must no longer be needed for the operating program's mission.
- Development of a thorough transition planning process that outlines the steps of phaseout and addresses technical, institutional, and socioeconomic issues associated with transition before any other action is taken.

Some categories and examples of the level of detail from the Rocky Flats Plant Transition Plan are:

Description of Facility Modification Task Elements – production contingency, nonproduction facilities, waste and environmental facilities;

Description of technical, safety and security considerations affecting sequence and control of modifications elements – standards, codes, and other technical requirements, facilities safety and environmental protection, health and safety/ emergency preparedness/radiation protection, environment and waste, safeguards and security;

Description of human resource considerations and stakeholder communications elements – human resources and administrative, stakeholder communications;

Description of practices to be used to ensure the quality of technical and operational changes resulting from transition elements – quality assurance, Rocky Flats Transition Program Quality Assurance; and

Description of budgets, schedules, and approaches for control elements – work breakdown structure, detailed schedule, detailed budget and cost.

Each transition plan will incorporate details that are site-specific (e.g., consolidation and transportation of classified material from Rocky Flats), but each will thoroughly explore all considerations for transition:

- Formal acceptance of the facility from the operating programs into EM after acceptance criteria are met. EM and the operating programs are currently developing the acceptance criteria. Among the criteria being considered are a completed transition plan, assurance that all landlord duties will continue to be accomplished by the operating program until transfer of the facility to EM, and verification and determination of the current status of the facility.
- Deactivation of the facility, pursuant to the approved transition plan, which includes the removal of reusable equipment, material, classified documents and parts of other activities that will reduce the long-term surveillance and maintenance costs.
- Turn over facility to EM. Ideally, deactivation will be completed before turnover to EM. This transfer of ownership ensures the operating program will remain responsible for the funding and control of the deactivation activities. Realistically, turnover to EM may occur at any time between formal acceptance and completion of deactivation activities, including the possibility of turnover occurring at the time of acceptance. In this case, EM would be entirely responsible for deactivation activities. The timing of the acceptance, deactivation and turnover to EM is controlled by funding, political and departmental workload considerations.
- Delivery to the end user for future use or to the Environmental Restoration Program for decontamination and disposition.

Transition planning and deactivation activities will, in many cases (e.g., Rocky Flats, Idaho Chemical Processing Plant) be a multiyear process, depending on the scope of the work to be done. Major time-intensive activities are to build characterizations and to deactivate the facility.

As recently as a year ago, few could have predicted the events that have occurred in the former Soviet Union. These dramatic changes, in concert with DOE's ongoing reconfiguration and nonnuclear consolidation efforts and the President's September 27, 1991, and January 28, 1992, speeches calling for massive cuts in the nuclear weapons stockpile, have directly affected one of the major missions of DOE: nuclear weapons production and dismantlement. Based on their reduced production work load, the Office of Defense Programs has hastened the reconfiguration of the weapons complex.

The result of all these events and actions is a sharp increase in the number of facilities being transitioned from a production mode to a cleanup mode. In anticipation of these facilities being turned over to EM for cleanup, the Office of Facility Transition and Management was established within six months of the President's September 27, 1991, speech. This program was formed to ensure that the proper steps toward transition are planned and executed. Because of this rapid shift and because no such initiative existed before, a small portion of the funds to support these activities were provided by other EM organizations, namely the Waste Management Program and the Environmental Restoration Program. Most of the funds, however, were provided by the Defense Programs. In the future, EM expects to gain facilities from their operating programs as well as from the Defense Programs and expects these line organizations to support transition activities.

Contaminated Facilities Inventory and Data Base

As previously mentioned, a significant number of contaminated facilities expected to be assigned to EM are for final disposition. An active listing of these facilities would allow for early interface with the operating program to better plan for future

transition activities. Additionally, by maintaining the listing on a data base, EM can readily access and/or update facility-specific information. The facilities listing is currently under development using information received from DOE Field Offices. The data base, also under development, is expected to include such information as a physical description of each facility, the nature and extent of contamination, the operating program currently responsible for the facility, the project date of facility shutdown and the estimated cost for facility decontamination and disposition.

Facility Condition Assessments

Condition assessments are expected to be performed on candidate facilities early in the transition process. In this way, any major discrepancies that could affect future transfer of the facility can be identified and corrective actions appropriately planned and budgeted. The condition assessment process will involve a team of technical people from Headquarters and the affected site touring the candidate facilities to evaluate the physical condition of the facilities and the nature and extent of contamination. From this evaluation, required transition actions are then developed and prioritized against other planned facility transition work.

The specific methodology for conducting facility condition assessments is still being developed and should be finalized later this calendar year.

EM Facility Acceptance Criteria

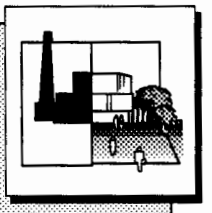
EM currently has draft criteria established for acceptance of surplus inactive facilities into the Environmental Restoration Program and is currently being revised to reflect all facility transfers into EM, both for environmental restoration (decontamination and dismantlement) and possible interim waste management technology development applications, or other reuse activities. These criteria are under review by the other operating programs. Defense Programs wants to transfer the facilities with minimal impact to their budget and mission, thereby placing the funding and program responsibility for meeting the acceptance criteria with the Office of Facility Transition and Management. Funding of transition activities is one of several issues currently being negotiated within the Department.

Transition Plans

Transition plans are required for all facility transfers into EM. The plans define the actions necessary to bring the identified facilities into a condition acceptable for transfer to EM. Additionally, the plans are used to identify and mitigate any impacts to the site work force and the surrounding community resulting from the change in facility mission. Transition plans may be developed on a sitewide basis if the entire site is involved in changing from a production mission to an environmental restoration and waste management mission. All plans are developed in coordination with the responsible operating program and are jointly approved by the respective Program Secretarial Officers.

Site-wide transition plans for the Rocky Flats Plant and preliminary plans for the Mound and Pinellas Plants are currently under development through their respective site transition working groups. Implementation is expected to begin later this calendar year, following completion of required National Environmental Policy Act Environmental Assessment activities currently under way for the nonnuclear consolidation of the nuclear weapons complex.

2.3.2 TRANSITION PLANNING CONSIDERATIONS

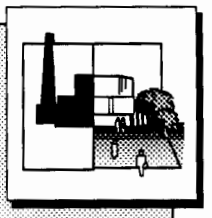


Key technical, management, and institutional issues will be analyzed during development and implementation of facility/site transition plans.

The following considerations were developed as national guidance for planning the transition of facilities/sites from their current production mission to an environmental restoration mission:

- Laws, regulations, formal agreements, and DOE Orders will form the basis for transition planning and execution.
- Transition planning will be coordinated with the appropriate regulatory agencies, host State, and other affected stakeholders.
- All vital safety and utility systems within the affected facilities, particularly ventilation and alarm systems necessary for maintaining the transferred facility in safe shutdown or standby condition, will be fully functional upon transfer to EM.
- Facilities undergoing transition will have a current safety analysis report and other technical safety requirements that address the change in facility mission and condition of the facility at the time of turnover to EM. The safety analysis process will be consistent with recommendations from the Defense Nuclear Facilities Safety Board.
- Transition activities will require appropriate National Environmental Policy Act evaluation and will proceed consistent with ongoing Programmatic Environmental Impact Statements within EM and Defense Programs.
- Facilities used in waste management operations or other support functions will remain operational as required to support future environmental restoration activities, including facility decontamination and dismantlement.
- Management of waste streams during the transition period will be in accordance with existing regulations; hazardous wastes will be managed in compliance with RCRA; low-level radioactive wastes will be managed in compliance with applicable DOE Orders; mixed hazardous and radioactive wastes will be managed consistent with both RCRA and DOE Orders; and transuranic wastes will be managed in compliance with DOE Orders and the waste acceptance criteria for the Waste Isolation Pilot Plant.
- All shippable/storable products will be removed from buildings to be transferred and then consolidated to the maximum extent possible.
- Affected site workers will be offered skill enhancement training to broaden their career opportunities in the rapidly growing field of environmental cleanup. Those who have successfully completed this training will be given priority for retention at the transitioning site.
- A coordinated effort among internal DOE organizations will be made to ensure that adequate funding is available to complete required transition activities.
- A systems engineering risk assessment approach will be used to determine future site and facility uses and possible directions for achieving them.

2.3.3 INTERNAL/EXTERNAL INTERFACES



EM, in conjunction with the responsible operating program, will involve the public to the maximum extent possible in planning and implementing the deactivation, transfer, and final disposition of identified surplus facilities.

An integral part of facility transition activities is effective communication, both internal and external to the DOE community. DOE realizes the importance of public participation in its cleanup activities and invites the input of stakeholders affected by transition activities. Internally, DOE promotes coordination between the operating program and EM in transferring facility cleanup responsibilities from one organization to another. DOE's strategy for maintaining effective internal and external communication during transition activities is described below.

Effective External Communication through Stakeholder Involvement

The transition process will draw together resources from many Federal and State agencies, Indian Tribes, outside organizations, and local communities. Federal agencies that should be included are the Departments of Energy, Labor, and Commerce. State agencies should include those responsible for environment, social services, labor, and local affairs. Other organizations should include employee organizations and labor, chambers of commerce and local business interests, and environmental and local citizen groups. Representatives from the local communities should include elected officials, Tribal representatives, and community leaders from nearby municipalities and counties.

The Rocky Flats Model

DOE recognizes that the changing mission of the Rocky Flats Plant and resultant decline in plant employment will have significant impacts on site workers and the surrounding communities. To help minimize disruptions caused by the transition, DOE is developing a communications plan to

- provide for an orderly transition of the site from the production mission to an environmental restoration and waste management mission and
- provide assistance in minimizing the disruption to workers and local communities as a result of downsizing the weapons complex.

DOE, State and local governments, elected officials, Rocky Flats employees, and other organizations have joined together to form the Rocky Flats Local Impacts Initiative Task Force. The Task Force will be actively involved in the formulation and execution of strategies to ensure future changes at the Rocky Flats Plant are transformed, to the greatest extent possible, into economic, socioeconomic, infrastructure, or educational advantages and to mitigate any negative impacts resulting from changes in the plant's future operations. This organization meets regularly and has the full support (organizational and financial) of DOE.

This Rocky Flats initiative should serve as a model group for other DOE sites facing similar transition activities in the future.

Regulatory Oversight

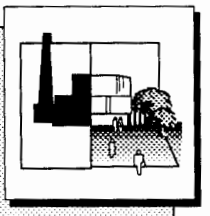
Almost all activities conducted at DOE sites are covered by associated regulations or DOE Orders. Applicable environmental laws include RCRA, CERCLA, the Clean Air Act, Clean Water Act, and the Safe Drinking Water Act. Many of these regulations either require operating permits or regular review by an oversight agency. As the course of site transition activities progresses, renewals or modifications to existing permits or agreements may be necessary as the mission of the facility/site changes. The oversight agencies will play an integral part in reviewing such changes.

Regular meetings are held with these agencies at every DOE site. These meetings are used to keep the oversight agencies "up to speed" on potential changes needed to permits or agreements for programs they administer. Such communication should flow through the existing network in place and operating at these sites. In most cases, DOE and the Management and Operating contractor are part of this network and will continue to meet their respective obligations to the regulatory oversight agencies.

Interdepartmental Cooperation

Any successful plan must have the support of all who follow it. With this philosophy in mind, DOE has developed the Transition Working Group concept to facilitate transition planning activities at production plants undergoing a mission change. The Rocky Flats Transition Working Group is composed of EM and Defense Programs staff from the Headquarters, Field Office, and Area Office level, as well as representatives from the Rocky Flats Management and Operating contractor. This mix allows for crosscutting through the normal and sometimes bureaucratic organizational structures in order to expedite planning, communication, and real action. EM and Defense Programs organizations come together in the Rocky Flats Transition Working Group to produce the required transition planning documents. Technical input is provided by DOE Headquarters oversight groups through their participation in regular Rocky Flats Transition Working Group meetings and document reviews. This structure is proving to be a useful tool in planning a smooth transition for the Rocky Flats Plant. DOE believes that this structure will also be effective in transition planning activities for other DOE sites.

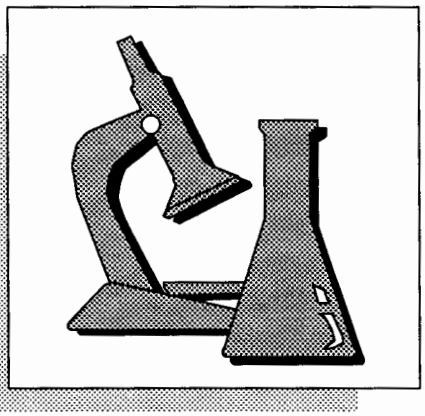
2.3.4 ACCOMPLISHMENTS AND FUTURE ACTIVITIES



Efforts are on schedule to develop and implement comprehensive site transition activities for the Rocky Flats Plant and preliminary site transition activities for the Mound and Pinellas Plants, pending the Nonnuclear Consolidation Environmental Assessment.

DOE is moving forward on transition planning. As previously mentioned, the Office of Facility Transition and Management was formed in February 1992 to coordinate DOE's activities in this area. This office is composed of DOE Headquarters and Field Office staff, as well as contractor representatives, assigned on a temporary basis. The Rocky Flats Transition Working Group was established to develop and deliver a site transition plan for the Rocky Flats Plant to Congress. This plan was completed and delivered to Congress in July 1992. In addition, similar working groups are under development for the possible transition of the Pinellas and Mound Plants. Transition plans for these sites should be completed by mid-1993, pending results of the National Environmental Policy Act Environmental Assessment for nonnuclear consolidation activities currently under way.

In addition to the site-specific transition planning activities in progress, the Office of Facility Transition and Management is also developing national policies and procedures to guide future facility and site transfers to EM.



Technology Development

2.4.0 PROGRAM OVERVIEW: TECHNOLOGY DEVELOPMENT TO IMPROVE WASTE MANAGEMENT AND ENVIRONMENTAL RESTORATION

By developing and improving technologies now, DOE expedites near-term remediation, reduces cleanup risks and uncertainties, lowers overall environmental cleanup costs, and averts the need for future cleanups.

Providing a National Focus

Within EM, the Technology Development Program carries out an aggressive national program of applied research and development to focus, manage, and accelerate the development and implementation of new and existing technologies to meet specific Environmental Restoration and Waste Management Program requirements (Figure 2.4.0). The objective of the Technology Development Program is to respond to Environmental Restoration and Waste Management Program needs by developing and implementing technologies to (1) facilitate compliance with applicable laws, regulations, and agreements; (2) minimize the generation of wastes; (3) clean up DOE sites at less cost than baseline technologies; and (4) ensure that the technical work force is developed and retained to meet EM goals. Already, EM technology development activities have included a broad national program to meet this immense challenge of converting research into application to solve DOE problems.

In June 1989, DOE set a 30-year goal to clean up all of its sites and to bring all sites into compliance with current and future environmental regulations. Three years ago, no coordinated plan existed for identifying or cleaning these contaminated sites; in three years, EM has invested time, money, and personnel to establish a wide range of programs to meet this immense challenge. A keystone of this plan is development of technologies that are better, faster, safer, and cheaper than technologies currently available. For example, at the Fernald Environmental Management Project, a bentonite cap was legally required to reduce radon emissions from wastes in the K-65 silo. To meet this requirement, a structured light source and a robotic retrieval device were used to remotely produce a three-dimensional map of the silo's waste surface. The bentonite was spread by the retrieval arm to a uniform depth and then the depth verified using the same mapping techniques. This technology application allowed the cap to be placed without requiring human exposure to the waste, and it also ensured its uniform coverage. The quantity of bentonite required, and thus the ultimate waste volume, was reduced by 50 percent.

The Technology Development Program should pay for itself by providing alternative technologies for environmental restoration and waste management that save significantly more dollars than it costs to develop them. Several cost savings of this type have been realized, particularly in the removal of volatile organic compounds from saturated soils. At the Savannah River Site, horizontal well drilling and air injection have been successfully demonstrated to be five times more effective than traditional pump-and-treat technologies. Technicians used this technology combination to remove 16,000 pounds of volatile organic compounds in just 16 weeks. In addition, DOE has issued or approved seven nonexclusive licenses to companies of diverse size so that they may employ the horizontal well technologies.

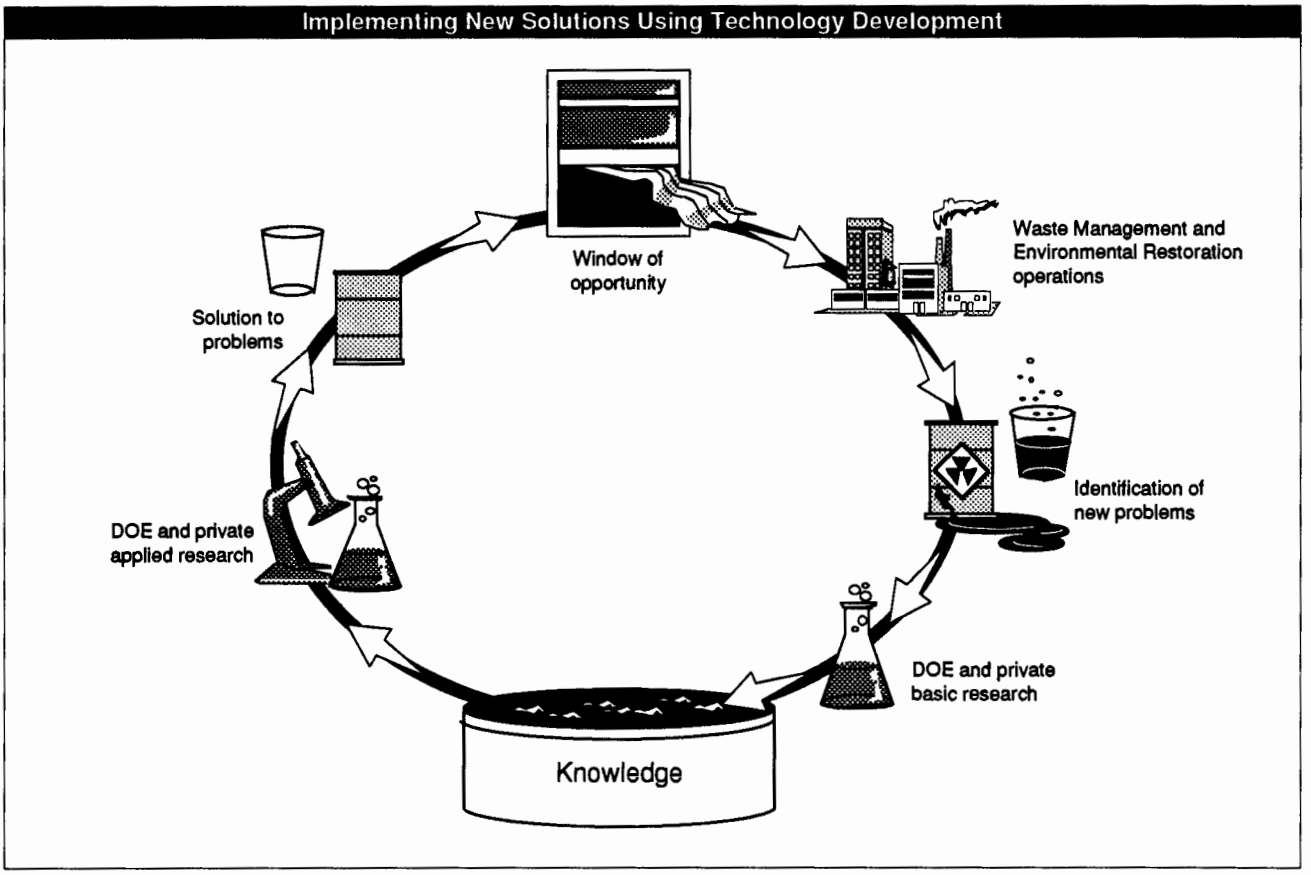


Figure 2.4.0. Technology Development draws from a vast, national reservoir of scientific knowledge to help solve environmental restoration and waste management problems.

A Window of Opportunity

EM has a window of opportunity to identify, develop, and demonstrate solutions to environmental problems. The regulations, the Memoranda of Agreement, the Tri-Party Agreements, and the laws demand that DOE meet its commitment within specified schedules. The quicker EM develops needed solutions, the sooner they can be used to fulfill the 30-year commitment.

If EM does not conduct research now and efficiently and quickly combine its talent and funding to maximum effectiveness, new technology will not be available. Every year that research is delayed, the window of opportunity closes a little more. Time and budget may demand that methods be used for treating waste that are inadequate or unsatisfactory and to provide only interim solutions to site cleanup problems. Meanwhile, requirements continue to evolve that will require more complete site cleanup that can only be done with new technologies.

Ensuring Transferrable Technology

EM must develop transferrable technologies. EM is keenly aware that budget and resource limitations dictate that its research and development program be conducted in a collaborative manner. A program at one site must consider similar technology needs at other sites and integrate these needs with its own. This collaboration will ensure that a related technology developed for one site can be implemented at other sites and that a technology development program at one site meets the needs of multiple sites. Mechanisms to support technology integration and technology development have been established to communicate development needs

within the DOE complex and industry and convey results to other sites with related needs.

To ensure that technologies applicable in one area are transferred to another, integrated demonstrations and programs use the best minds and technology in the private sector, the academic community, and the national laboratories. A new robotic arm and associated tools for use in highly radioactive waste tanks have resulted from such unique partnerships. A cooperative effort by the national laboratories and foreign and domestic firms is modifying space age technology for use within these tanks. Small openings into the underground tanks and eight feet of earth enhance public safety but complicate access to retrieve waste and to clean out the tanks. This new robotic arm is being demonstrated for retrieval purposes and uses computer-generated graphic displays to provide the equipment operator with a clear picture of operations even when direct television viewing is impossible because of debris within the tank.

Major Technology Thrusts

To better respond to its various user groups, the Technology Development Program is organized into six major areas:

- groundwater and soils cleanup,
- waste retrieval and processing,
- waste minimization and avoidance,
- infrastructure,
- technology integration and environmental education development, and
- program management.

Each of these program elements will be discussed in the sections that follow.

Each of the technical program areas described in the FY 1994–1998 Five-Year Plan is important. Each can cut time and costs in accomplishing the cleanup mission at DOE sites. Resulting technologies, if used correctly and rapidly, will (1) increase remediation program effectiveness, (2) reduce overall funding requirements, and (3) provide added assurance that DOE cleanup goals and commitments will be met.

Varied Issues and Solutions

Environmental issues are regulatory, economic, and societal. Some elements of society perceive the risk from DOE's waste as one they did not create or choose. Others feel that DOE activities place their families and the environment in danger. Often, the issues become emotional. The avowed openness on the part of DOE, its support of an environmental education program, and increased emphasis on public and stakeholder involvement serve to address and mitigate societal issues. A similar awareness and response to regulatory and economic issues prevail throughout each of the six technology areas. These programs will be supported not only in financial terms but at all management and staff levels.

EM will take advantage of the existing window of opportunity to allow science and research assistance in finding optimum solutions to DOE's cleanup problems. Such solutions must account for the pertinent technical, economic, regulatory, political, and societal factors and issues that affect the cleanup program. The answer is not just political or emotional; science will have solutions to these problems.

2.4.1 TECHNOLOGIES FOR CLEANING UP CONTAMINATED GROUNDWATER AND SOILS

Groundwater and soils cleanup technologies (1) destroy contaminants in place, (2) remove and isolate contaminants for safekeeping, or (3) safely and permanently neutralize or immobilize the contaminants in place.

Soil and groundwater cleanup projects are designed to demonstrate technologies to remove or reduce potential health and environmental risk resulting from radioactive and/or hazardous materials (including heavy metals and toxic organic compounds) in soil and groundwater. Activities include development of techniques for rapid, accurate, and nonintrusive site characterization and contaminant detection. These activities also include the evaluation of interim measures to retard migration or contain radioactive and hazardous material until effective cleanup or treatment technologies can be developed.

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 discharge to the air and surface waters. In these cases, in situ methods (methods that treat the contaminants in place) for environmental restoration are generally preferable from technical and regulatory standpoints. First, from a technical standpoint, in situ methods avoid the risk and cost that result when large volumes of contaminated soils and widely dispersed contaminants in groundwater must be handled. Second, from a regulatory standpoint, in situ methods are preferable because they minimize (1) destruction to the environment, (2) public exposure, and (3) the volume of waste for disposal. Nevertheless, for those cases for which in situ methods may not be acceptable, other innovative technologies must be explored, including extraction, recovery, and processing alternatives that reduce or eliminate environmental and health risks.

Higher priority must be given to contaminants that exhibit mobility, high toxicity, and long-term persistence in the environment 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 to halt expansion of the contaminant into clean, unspoiled areas.

Accomplishments

Significant advances have been made, particularly in characterization and in situ treatment. New technologies associated with soils and groundwater cleanup have improved capabilities to solve environmental restoration problems. Specific accomplishments achieved by the Technology Development Program include:

- Demonstration of the effectiveness and regulatory acceptability of horizontal well technologies for site remediation. Use of horizontal wells to access a contaminated aquifer provided an in situ air stripping capability five times more effective than conventional pump-and-treat techniques for removal of tetrachloroethylene and trichloroethylene from contaminated aquifers. This contaminant removal technique, combined with permitting of a complementary off-gas treatment technique, provided a complete system solution to a complex problem. Further, the horizontal wells provided the "demonstration bed" for in situ bioremediation through injection of a

methane/air mixture to enhance microbial destruction of the contaminants.

- Demonstration of innovative directional drilling technologies for increased access to contaminated zones. These technologies have been transferred to private industry and other Federal agencies for implementation. These same drilling techniques have provided opportunities for installing monitoring sensors and containment barriers to prevent further migration of contaminants.
- Development of techniques for real-time monitoring of removal of plutonium-contaminated soils, thereby significantly reducing the volume of soil to be excavated, treated, transported, and disposed of.
- Demonstration of the potential of remote-sensing methods using thermal imaging for rapid screening characterization of large areas such as those at Idaho and Hanford Sites. Remote-sensing methods will greatly improve the cost-effectiveness of ground-based characterization methods and reduce overall costs.
- Demonstration of the effectiveness of the cone penetrometer (a sensor on the end of a drilling machine) electromagnetic mapping, and reflection seismology to provide in situ measurements to characterize the soil as well as the contaminants at a contaminated site. These in situ measurements significantly reduce the number of wells required for site and contaminant characterization. Figure 2.4.1a illustrates the use of the cone penetrometer in subsurface characterization activities.
- Completion of a full-scale, clean site, demonstration of dynamic stripping involving a system of thermal remediation and underground imaging techniques. This technique, illustrated in Figure 2.4.1b, is suitable for use in rapid cleanup of localized underground spills of nonaqueous-phase liquids, such as gasoline and other fuels.

Milestones and Indicators of Progress

Technology research and development programs will pursue a multitude of techniques that improve and accelerate site characterization, increase the efficiency of remediating contaminated soil and groundwater, and facilitate regulatory acceptance of new technologies. Emphasis on the development and implementation of in situ treatment technologies with their concomitant technical and regulatory benefits will continue. Planned program milestones for FY 1994–1998 include

- Development of remote, noninvasive, nondestructive, and field deployable characterization systems to provide high-resolution, quantitative information for surface and subsurface characterization, contaminant detection, and monitoring of contaminant migration.
- Development of effective methods for treating and removing hazardous heavy metals from soils and groundwater, including mercury contamination at Oak Ridge.
- Performance of further field tests of in situ remediation technologies (i.e., bioremediation, electrokinetics, soil washing, air stripping of volatile organic compounds, cleaning solvents, vitrification, and mine waste treatment). Included will be cold tests of selected thermal and electrical remediation technologies for mixed waste landfills.
- Pursuance of technologies for remediation of contaminated soils. This milestone will include development and demonstration of real-time sensors to enhance volume reduction goals of soil separation demonstrations, soil treatability testing on soil samples from the Nevada Test Site and other DOE sites, evaluation of revegetation of desert areas, and industrial uranium- and plutonium-contaminated soil separation demonstrations to serve as treatability studies for selecting remedial measures under Federal Facility Compliance Agreements.

- Evaluation and demonstration of off-gas destruction technologies as replacements for current carbon absorption techniques to eliminate wastes subject to land disposal restrictions.
- Complete initial in situ biodegradation methane injection campaign to evaluate the enhancement of indigenous microorganisms and to evaluate cost-effectiveness of biotechnology treatment alternatives. In addition, pursue bioremediation technologies, including demonstration of bioremediation characterization wells for volatile organic compounds in arid soils.
- Initiate thermal enhancement (in situ resistive heating and radiofrequency heating) methods for improving removal of solvents from clay.

Penetrometer Subsurface Characterization

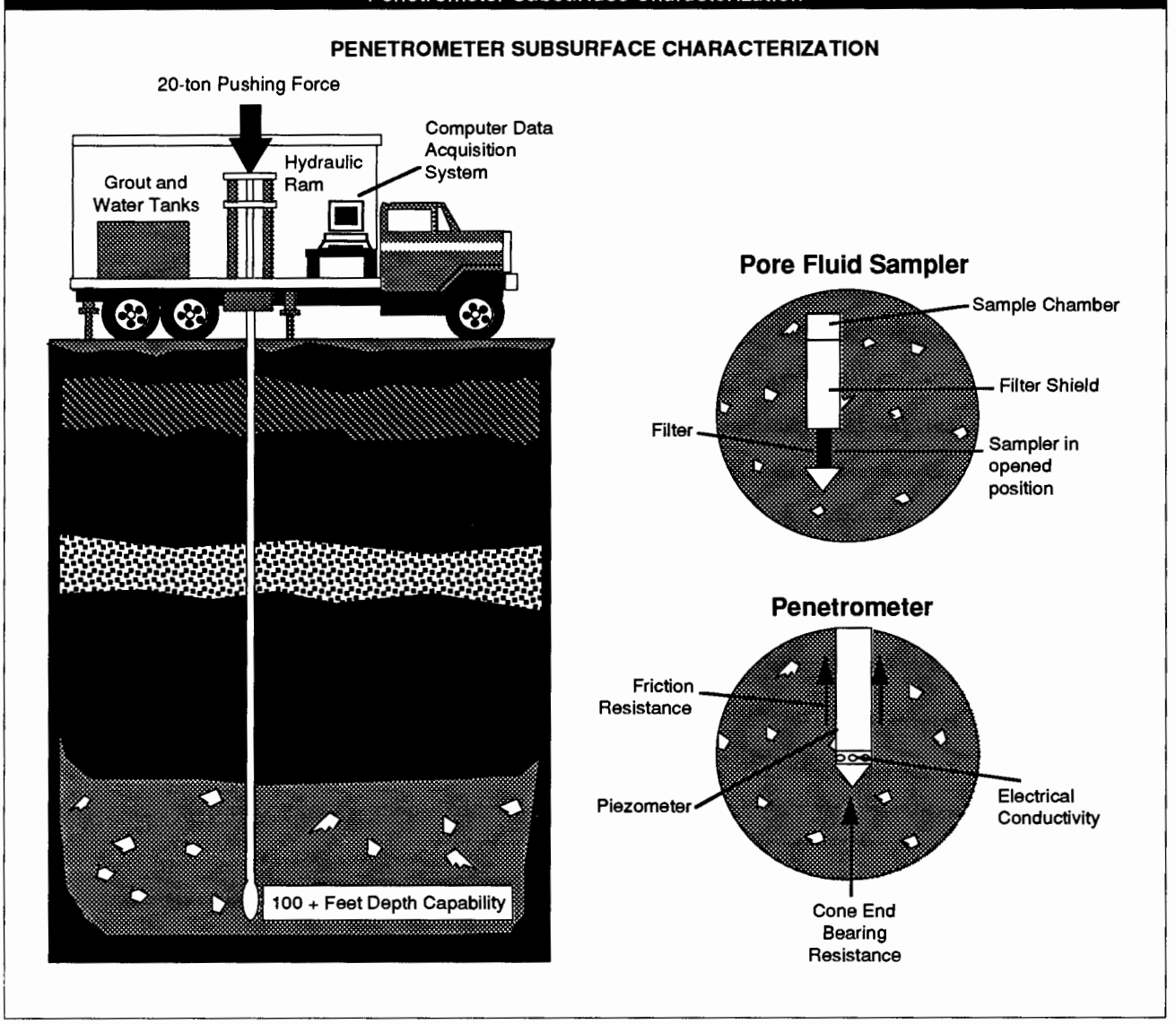


Figure 2.4.1a. Cone penetrometer can be used to collect fluid samples and to take various measurements of subsurface conditions (e.g., electrical conductivity and fluid pressure).

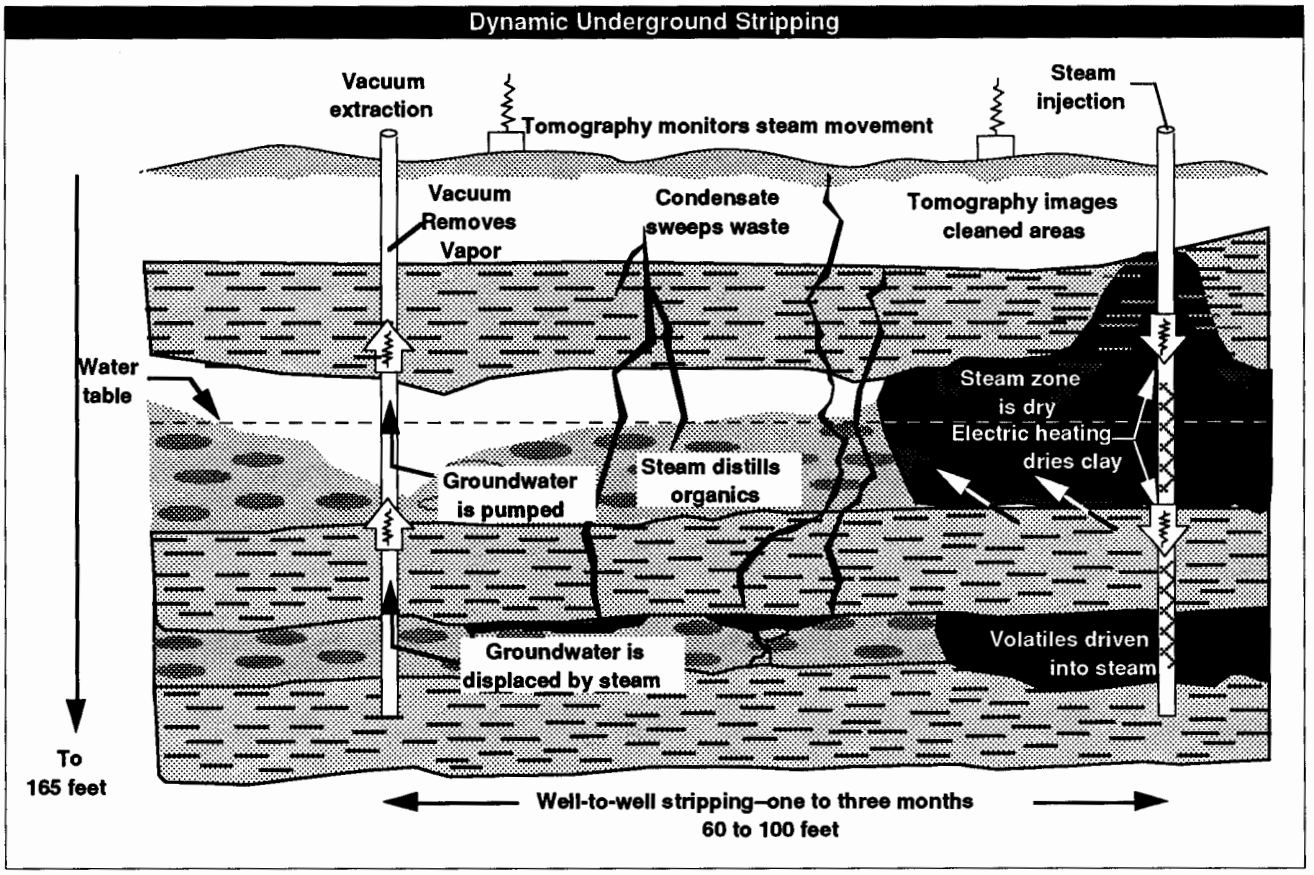
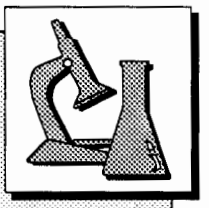


Figure 2.4.1b. Soil and groundwater cleanup technology programs have advanced the state-of-the-art in characterization, monitoring, and treatment technologies.

2.4.2 TECHNOLOGIES FOR RETRIEVING AND PROCESSING WASTE



Where wastes may not be stabilized and disposed of in place, successful waste retrieval and processing to destroy or fix hazardous and radioactive components for secure disposal is the key to avoiding future environmental cleanup demands.

Within the DOE complex, large quantities of high-level waste, low-level waste, and transuranic waste have been buried or stored. Before 1970, low-level and transuranic wastes were buried in common shallow land burial grounds. Over the years, many of the older disposal containers (mainly 55-gallon drums and boxes) have been breached and have contaminated the adjacent soil. Considering TRU solid waste, more than 190,000 cubic meters of waste have been buried, and 60,600 cubic meters have been retrievably stored. High-level waste stored at four DOE sites represent another 381,000 cubic meters of volume. Most high-level waste is currently stored in underground storage tanks as sludge/liquids (77 million gallons) with a small amount as granular calcined solids. Most of these high-level and transuranic wastes are mixed with hazardous and are thus classified as mixed wastes.

In addition, another 107,000 cubic meters of mixed low-level waste is stored within the DOE complex and is awaiting disposal. All mixed low-level and high-level waste must be treated to remove and/or immobilize the hazardous components before final disposal. In the case of mixed transuranic waste destined for deep geologic disposal, the hazardous components must not exceed established waste acceptance criteria. This may require treatment of the waste to modify the hazardous waste component or sorting out the transuranic component. Most of the hazardous components of the mixed wastes have not been characterized. However, they represent the entire gamut of organic and inorganic hazardous wastes.

Effective May 8, 1992, all DOE mixed waste streams fall under EPA's land disposal restrictions. As such, they cannot be stored indefinitely, nor can they be disposed of without prior treatment to destroy, separate, or immobilize the hazardous component. Depending on weapons production activities, as much as 20,000 cubic meters of mixed waste could be generated annually from about 100 separate waste streams. Mixed wastes pose serious legal and technical problems that have not yet been resolved. Means to treat and dispose of these wastes in compliance with applicable Federal and State laws are under investigation within varied technology development programs.

Another form of waste, representing potentially large volumes, is that associated with decontamination and decommissioning of contaminated buildings and equipment. More than 500 separate facilities have been identified. Although materials will be recycled when possible, this activity will result in new waste generation.

Available technology is inadequate to cost-effectively solve the problems at hand. Attempts to characterize high-level waste in the 149 single-shell tanks at Hanford, which contain more than 66 million gallons of semiliquid saltcake and sludge, are in the early stages. Collection of a single core sample and subsequent analysis from one of these tanks can cost about $500,000. All analyses of the samples must be done in shielded facilities (hot cells) because of the high levels of radioactivity. Before treatment, semisolid wastes in the Hanford tanks will need to be mechanically retrieved or dissolved. Techniques to do this are currently not available. The potential presence of explosive gases in the free space within the tanks, coupled with heat-sensitive and potentially reactive inorganic ferrocyanides, poses special technical problems that must be resolved.

Assay procedures to distinguish low-level and transuranic wastes in retrievably stored drums are slow and of low sensitivity; they can only poorly define the quantity of transuranic waste. Currently, solid organics and hazardous waste metals cannot be identified in intact drums, nor can absorbed liquids. EPA has not established Best Demonstrated Available Technologies for mixed wastes except for vitrification of high-level waste, a process that melts waste and converts it to a glass-like substance. The only technology recommended to date by EPA for low-level mixed wastes is incineration. Real-time monitoring and control of incineration effluents to preclude undesirable environmental releases are needed. To date, however, public acceptance of this treatment method has not been broad. At this time, only two DOE incinerators, the Toxic Substances Control Act Incinerator at Oak Ridge and the Waste Experimental Facility Incinerator at the Idaho National Engineering Laboratory, are permitted for handling waste contaminated at very low levels with radionuclides and only for specific materials. This capacity is less than three percent of that required to handle the remaining estimated annual generation rate and could not substantially reduce the already stored wastes.

For mixed transuranic wastes, vitrification is the only method accepted by EPA. However, many other treatment methods suitable for hazardous waste have the potential of being retrofitted to handle radioactive mixed waste. For most of these methods, considerable research, development, demonstration, testing, and evaluation must be done to ensure the needed confidence and margins of safety. A major portion of DOE's technology development program relates to development of these technologies.

Methods are not available to exhume buried transuranic waste without risking the release of airborne plutonium particles. Safer waste evaluation technologies are needed.

Also, because of the extremely high costs associated with long-term storage of high-level waste, methods are urgently needed to reduce their volume. By using various separation techniques, the majority of the original volume of waste ends up as low-level waste, which is relatively inexpensive to dispose of. The technologies needed to convert these low-level streams to an acceptable final form must be developed.

Accomplishments

EM has made an integrated effort to develop and implement technology for treating highly radioactive waste. A strategic plan was drafted for the development of short- and long-term treatment of high-level waste (e.g., waste in underground storage tanks). This plan outlines overall needs and opportunities, levels of effort, and priorities for research and development in this area. EM is working to redefine the Hanford underground storage tank remediation program. The underground storage tank waste is highly heterogeneous, and achieving cost-effective characterization, retrieval, treatment, and waste form processing are major needs and challenges. Research plans for ultrasonic mapping of underground storage tank contents and an integrated sampling/retrieval platform for mounting within the tanks were formulated. Options are being pursued for efficient chemical separations of the tank waste to minimize the volume of waste that must ultimately be disposed of in a geologic repository. It is estimated that billions of dollars can be saved with modest volume reduction.

The transuranic extraction process was applied to relatively homogeneous high-level waste with striking results. The extraction yielded a twentyfold reduction in high-level waste volume, and the remaining low-level waste volume was commensurate with that of the original waste. This work is continuing.

Planning was initiated for subsurface barrier technologies to prevent excessive movement of contaminants from their original location.

Decontamination and decommissioning activities included a successful demonstration of the microwave spalling of concrete as a potential method for removing contaminated surface layers.

Testing of plasma furnace treatment technology for low-level mixed waste has begun. A number of treatment technologies have been initially evaluated for subsequent scaled testing.

Milestones and Indicators of Progress

Technology development activities in waste retrieval and processing are closely tied to ongoing and planned activities by EM. The goals conform with the spirit and the letter of the various EPA/State/DOE Compliance Agreements, including those associated with land disposal restrictions. FY 1992 and FY 1993 milestones for activities at sites such as Hanford and Idaho represent critical subactivities within the overall site remediation work plans.

Some of the key milestones expected to be met by the end of 1993 include:

- Extend advanced separation technologies for removal of transuranic waste, cesium, and strontium to bench- and pilot-scale systems to reduce the high-level waste to be vitrified for disposal by threefold to fivefold.
- Complete initial studies relating to pyrochemical methods for Idaho Chemical Processing Plant high-level waste calcine separations of radionuclides to reduce approximately tenfold the volume of calcined waste.
- Complete initial efforts for development/product improvement of key mixed waste treatment technologies including thermal treatment. Examples of treatments include vitrification, supercritical water oxidation, plasma furnace, and molten salt. These techniques must be developed to treat waste streams effectively and to allow DOE to comply with Federal and State agreements.
- Complete technology transition for in situ vitrification for contaminated soils so that this cost-effective treatment technique can be used throughout the DOE complex and industry.
- Complete prototype surface and subsurface barrier construction to contain contamination from leaking tanks in order to prevent further soil and groundwater contamination and reduce subsequent cleanup costs.
- Complete polyethylene encapsulation demonstration, waste dislodging and conveyance system demonstration, and pretreatment pilot plant design and transuranic extraction centrifugal contractor to enhance retrieval and treatment process.
- Characterize underground storage tank waste with various in situ methods (i.e., integrated instrument platform, robotics mole, ultrasonic mapping) to guide effective retrieval and treatment.
- Complete technical evaluation reports on ice electrodes, biodegradation of nitrates, ultrasonic detoxification, polychlorinated biphenyl screening, cryogenic retrieval, aerial surveillance and analysis, and waste from product quality evaluation. Various technologies must be evaluated to help process waste streams.
- Update of the Comprehensive Treatment and Management Plan for Rocky Flats Plant using a national approach to allow DOE to comply with Federal and State of Colorado agreements.

2.4.3 TECHNOLOGIES THAT AVOID OR MINIMIZE WASTE GENERATION

The best waste management approach is, when possible, to avoid generating waste, and when avoidance is not possible, to employ technologies that minimize the quantity and toxicity of waste produced.

The waste minimization and avoidance program focuses on the elimination of hazardous and radioactive material at the source through material substitution or changes in hazardous-waste-producing processes. The second priority is to recycle within the operating plant by reusing or reclaiming those potential waste materials that cannot be eliminated. Four programs are directed toward waste minimization. Each consists of several research projects designed to test and demonstrate a process or material with the goal of reducing or eliminating hazardous waste.

Environmentally Conscious Manufacturing: This program focuses on all phases of design and manufacturing and transfers technologies developed at national laboratories to the shop floor. Encapsulation, cleaning, joining, coating, metal finishing, process control, packaging, and assembly will all be treated as interdependent processes to minimize the generation of hazardous waste in electronics manufacturing. This work is being done at DOE's Kansas City Plant, since approximately 90 percent of all U.S. electronic manufacturers supply components for processes at that site. The technologies are being rapidly transferred to these manufacturers through this relationship.

EM/U.S. Air Force Memorandum of Understanding: This program establishes an agreement among DOE, the U.S. Air Force and several industrial partners, including Boeing Corporation, to address shared waste minimization problems, including testing nonhazardous solvents and minimizing scrap during metal casting and finishing operations. The primary focus of the program is to eliminate chlorinated solvents in metals preparation, paint stripping, plating, and cleaning operations.

Waste Component Recycle, Treatment and Disposal: This program is developing technology to maximize the recycle of materials from the non-physics portion of nuclear weapons (e.g., electronic circuits, mechanical components, and parachutes). Aluminum, steel, gold, and silver are among the materials to be recovered. A variety of technologies are being considered to improve the segregation of hazards and minimize the volume and toxicity of waste. The baseline goal of the program is to reduce waste mass by 60 percent: 30 percent through recycle and 30 percent through destruction of organics.

Alloy Control for Recycle: The Oak Ridge Y-12 Plant is developing metal uranium and uranium alloy recycle and zero discharge manufacturing technologies. This integrated approach includes near net-shaped and forming processes to reduce scrap, uranium recycling technologies, improved recovery and purification of scrap, and improved cleaning techniques to eliminate the hazardous component of the waste stream.

Accomplishments

Environmentally Conscious Manufacturing: Emissions have been reduced by 80 percent from the 1988 baseline at the Kansas City Plant. Laser ablation of flux residues, in lieu of organic solvents, has been demonstrated in a laboratory-scale experiment. Solvent substitutes have been identified for testing. Test apparatus has been designed and constructed and experiments completed to quantify oxide reduction under controlled atmosphere fluxless soldering and to characterize corrosion. Acoustic wave technology has been selected for volatile organic compounds monitoring, and the first Portable Acoustic Waste Sensor test module has been made. A facility has been prepared for equipment installation, and specifications have been prepared for equipment purchased.

EM/U.S. Air Force Memorandum of Understanding:

- Solvent substitution data have been compiled into the first issue of the Solvent Substitution Handbook (a data base accessed through the DOE computer system).
- Building alterations have been completed and equipment installed for subsequent testing for the spray casting process.
- A furnace for precision die casting of plutonium has been designed, fabricated, and installed at Lawrence Livermore National Laboratory and is being tested.
- Testing of nozzle materials to determine compatibility and nozzle lifetime is ongoing, and several candidate materials have been identified as a result of these tests.
- The component disposal planning group was established.
- A strategic plan was developed, and bench-scale tests for component treatment were established and coordinated.
- Plans were completed for testing vitrification, steam reforming, and acid digesting, with cryofracture as a pretreatment process to homogenize the component waste stream. Pretreatment technologies are in the process of being transferred to the production facilities for full-scale implementation.

Depleted Uranium Waste Minimization: Freon, an ozone-depleting gas, has been completely eliminated from depleted uranium machining processes at the Y-12 Plant. In addition, the nitric acid pickling bath for depleted uranium has been eliminated by using ultrasonic cleaning. Several technologies have been demonstrated for minimizing depleted uranium scrap (Figure 2.4.3), including chemical purification of impure massive scrap for subsequent recycle, depleted uranium chip recycle process, low-level waste monitoring equipment, use of an arc saw to minimize saw fines, and use of nondestructive examination techniques to evaluate mechanical properties of rolled plates.

Milestones and Indicators of Progress

In FY 1992, the technologies developed in FY 1990 and FY 1991 for the environmentally conscious manufacturing project were applied to a specific, nonclassified electronic component in a manufacturing systems environment.

Goals for the DOE/U.S. Air Force Memorandum Of Understanding program include completion of the pilot-scale design of the spray casting equipment by FY 1993 and fabrication of the equipment by FY 1994. The Solvent Substitution Handbook will be completed by FY 1993.

The waste component recycle, treatment and disposal program goal is to identify and demonstrate the end-to-end recycle/treatment/disposal process. The Technology Development Program will work in conjunction with the Waste Management Program and Defense Programs to fully integrate the technology with existing processes.

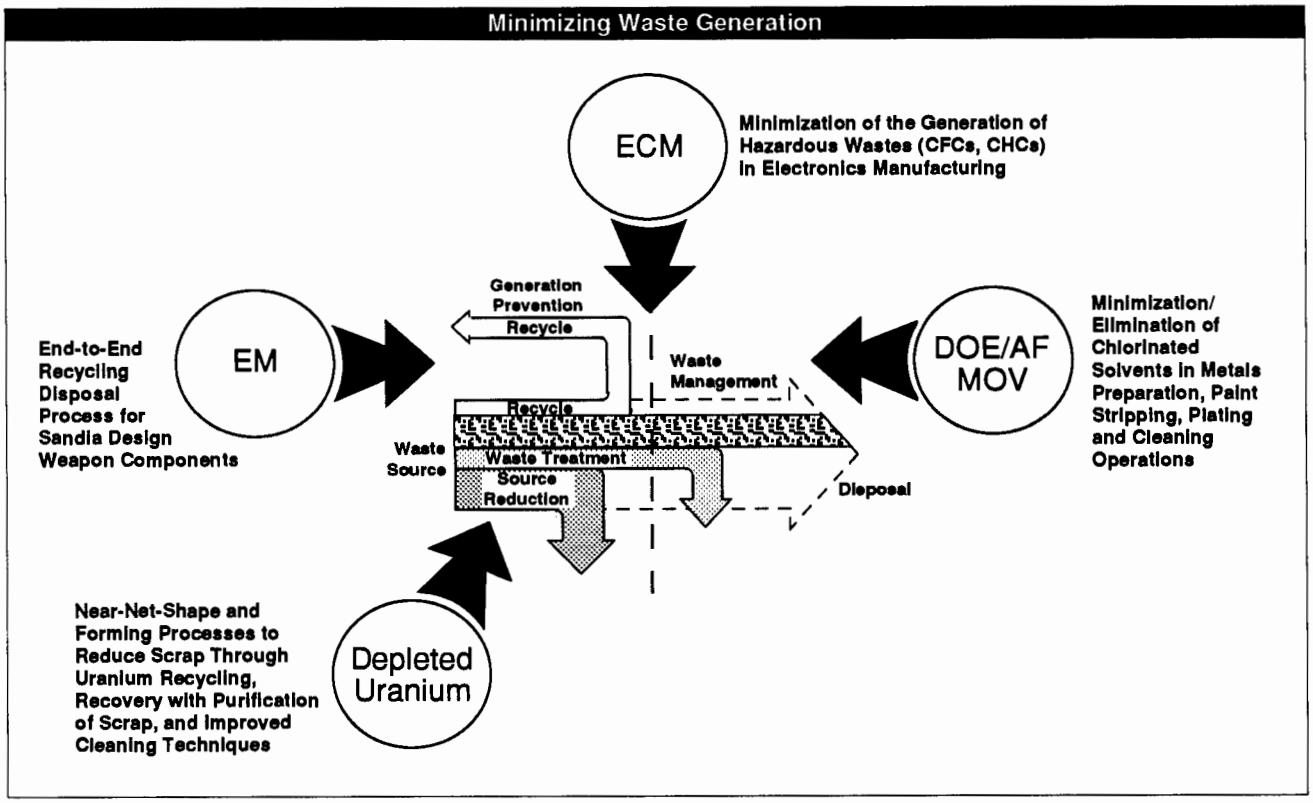


Figure 2.4.3. The waste minimization and avoidance program focuses on eliminating hazardous and radioactive material through material substitution or changes in waste-producing processes. A number of cooperative agreements support the program.

2.4.4 SUPPORTING TECHNOLOGIES AND INFRASTRUCTURE PROGRAMS TO CARRY OUT THE EM MISSION

A sound infrastructure is essential to support the EM mission.

Success in environmental restoration and waste management requires infrastructure development (Figure 2.4.4) to provide better analytical support resources to accurately characterize waste, water, and soil; systematic decision support to guide waste cleanup and treatment; reliable robotics systems to improve safety and reliability and reduce cost; development of laboratory facilities for directed research in environmental restoration and waste management; comprehensive capabilities for responding to radiological and other hazardous materials transportation emergencies; and a program to provide a central point of contact for general public inquiries and requests for information, to explain transportation and emergency management operations, and to solicit public input on EM plans and activities.

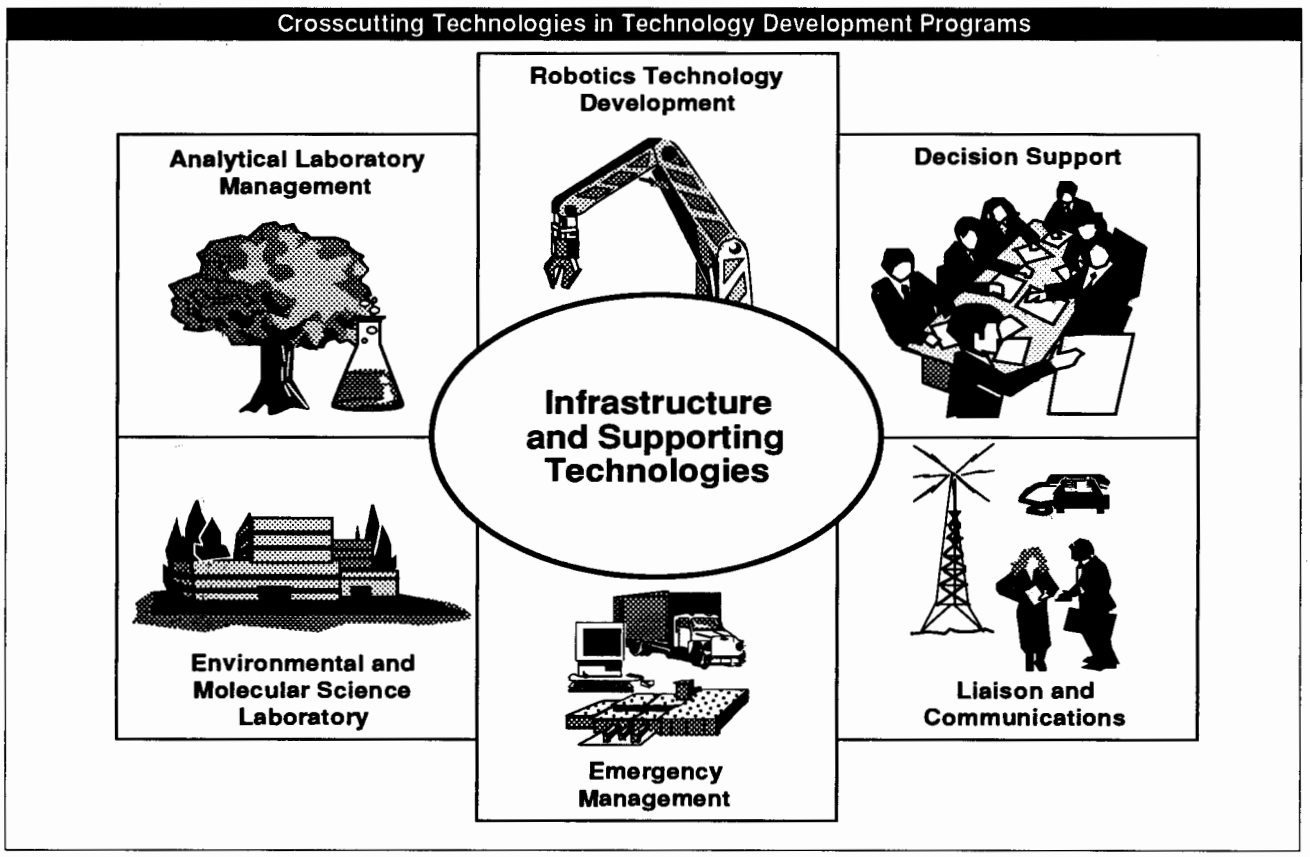


Figure 2.4.4. Supporting technologies and infrastructure activities provide crosscutting technologies and support to Technology Development and other DOE programs.

Liaison and Communications

This program provides a central point of contact for general public inquiries and requests for information pertaining to activities within EM by managing an information center that includes library research capabilities, provides reference documents, and distributes public information materials. This program also provides a coordination point for technology development programs (including transportation and emergency management) and the field for interacting with State, Tribal, and local government officials. It also serves to integrate technical programs by facilitating internal interactions and information sharing across DOE programs. Exhibits, videos, and publications to support program information needs are developed, produced and distributed through the Liaison and Communications Program.

Institutional Support includes developing and maintaining a process that facilitates effective interactions and understanding among DOE decision makers and the affected and interested public.

Institutional Support includes

- internal relations support, which facilitates internal DOE interactions;
- external relations support, which assists external working groups such as Western Governors Association, UETC, and other national/technical organizations with meeting arrangements and program information;
- supporting risk communication and Tribal awareness training; and
- policy reviews to identify and resolve key issues with regard to public input.

Information and Communications provide information tools and activities to support response to inquiries about technology development programs, especially in the areas of transportation and emergency preparedness. Activities include

- planning and evaluation to support outreach plan updates and evaluate program activities;
- developing and maintaining visual materials, including slides, videos, films, and overhead visual materials;
- developing and updating print materials, including fact sheets, brochures, pamphlets, and other information materials; and
- developing, maintaining, and displaying exhibits.

Liaison and Communication accomplishments include the development and distribution of the Transportation Outreach Plan, which describes ongoing activities and future plans for involving the public in addressing transportation-related issues. Other accomplishments include developing a new exhibit explaining DOE's role in responding to transportation emergencies involving radioactive materials; reaching more than 31 million television viewers with a film on radioactive materials transportation; producing and distributing 25 printed information products; maintaining a central source for print and video information on DOE transportation and emergency-related activities; and maintaining a program for direct interaction with local government officials.

Analytical Services

The Analytical Services Program provides complex-wide support for environmental restoration and waste management activities and other DOE elements requiring environmental sampling and analysis.

Credible analytical data are crucial for efficient waste management and environmental cleanups, as well as for demonstrating regulatory compliance. The Analytical Services Program ensures that all EM operations have the environmental sampling and

radiochemical, chemical, and physical analytical support required to provide the environmental data critical to EM's mission.

The Analytical Services Program is divided into three complementary components: (1) Resource Management, which develops and implements strategies for achieving and managing the required laboratory capacity; (2) Analytical Support, which develops, adapts, compiles, validates, and secures regulatory acceptance of methods used for the analysis of environmental samples; and (3) quality assurance/quality control, which develops and oversees the implementation of quality assurance/ quality control requirements for environmental sampling and analysis.

Analytical Services Accomplishments

Accomplishments in the Analytical Services Program have largely been in establishing program objectives and direction and include the following:

- issued EM Analytical Services Program Five-Year Plan;
- issued initial version of the EM Sampling and Analytical Methods Compendium;
- developed EM Quality Assurance Guidance for Environmental Sampling and Analysis;
- developed Performance Evaluation and Assessment Program for environmental analytical laboratories;
- developed policy to increase commercial laboratory support for EM programs;
- developed interim acquisition strategy for obtaining necessary EM laboratory capacity;
- completed assessment of mature field analysis technologies; and
- initiated training of a streamlined approach to planning for EM sampling and analysis.

Analytical Services Milestones

Milestones in the Analytical Services Program include the following:

- issue updates of the DOE Sampling and Analytical Methods Compendium—second and fourth quarters annually;
- implement Performance Evaluation and Assessment Programs for DOE Complex and commercial analytical laboratories—second quarter FY 1993;
- initiate DOE Sample Management System—first quarter FY 1993; and
- prepare acquisition plan for analytical services—second quarter FY 1993.

Decision Support

The Decision Support Program provides tools and methodologies to identify, assess, analyze, and control cost, schedule, and technical decisions associated with the Technology Development Program. Key program elements address the development of risk assessment methodologies and risk-based standards and support review activities using the expertise of panels and committees under the auspices of external organizations such as the National Academy of Sciences and the National Council on Radiation Protection and Measurements.

The Decision Support Program provides technology development activities with improved capability to respond to regulatory drivers that govern EM-wide activities.

Environmental regulations and site compliance agreements drive the development of tools and methodologies needed to implement and document the technology filtering process, which is based on technical and cost factors, compliance milestones, and regulatory and institutional requirements and

acceptance. Risk analysis is conducted to assess the impact of current and proposed standards on cleanup activities. Cost-effectiveness and cost-benefit analysis methodologies are developed to foster improved business management practices mandated by DOE Orders and the Office of Management and Budget regulations.

Decision Support Accomplishments

Accomplishments of the decision support program have focused on developing methods for sound decision making and include the following:

- developed techniques for performing cost-effectiveness and benefit analyses to evaluate technologies, and applied these techniques to demonstrate cost savings relative to existing approaches;
- compiled a Directory of Federal Agencies and University Research Centers supporting research and development in environmental restoration and waste management;
- completed the first phase of a realistic analysis of potential health and environmental risks at DOE sites; and
- conducted workshops on problems in performance assessment and risk analysis and on the application of Best Available Technology to regulatory issues.

Decision Support Milestones and Indicators of Progress

In the near future, the decision support program will focus on developing risk-based decision-making tools and will include the following:

- develop increased understanding and visibility of technical aspects of risk;
- update/enhance the Interagency Directory of Research and Development Technology;
- review risk-based standards for radioactive and mixed waste;
- continue modification and adaptation of tools and capabilities for analyzing technical cost and for scheduling risk;
- continue cost-effectiveness and benefit analysis of research, development, demonstration, testing and evaluation technologies for selected Technology Development Program elements;
- initiate the Interagency Waste Technology Information Center; and
- continue consensus development activities, which are (1) National Laboratory Directors' Steering Group on Environmental and Occupational Health Standards, (2) National Council on Radiation Protection and Measurements reviews of mixed-waste and radiation protection standards, (3) technical basis for best available technologies, and (4) National Academy of Sciences review activities.

Robotics

The Robotics Program provides technology to allow the remote characterization and remediation of DOE sites containing radioactive, hazardous, and mixed waste. Robotics spans a broad range of technology, including master-slave, electromechanical, and servo-manipulators; remotely operated heavy equipment; special remote tooling; industrial-type programmable and autonomous robots; mobile platforms and transporters; and sensing and control systems.

The Robotics Program addresses (1) waste storage tank inspection, waste characterization, and retrieval; (2) buried waste including characterization, downsizing, and remediation; (3) waste facilities operations, remote and automated inspection of interim stored waste and automated opening, repackaging, loading, and unloading systems; (4) contaminant analysis automation to increase throughput, decrease personnel exposure, and enhance quality assurance; (5) decontamination and decommissioning (D&D)—facility surveys, mobile decontamination platforms, and size reduction systems; (6) waste minimization to reduce need for storage and remediation; and (7) crosscutting and advanced technology for enhancing robot/automated systems.

Accomplishments in Robotics

Accomplishments in the Robotics Program have resulted in greater efficiencies in site characterization and reduced worker exposures to hazardous and radioactive wastes. They include the following:

- Waste Storage Tanks—integrated and demonstrated inspection and retrieval technologies, using leveraged $30 million test-bed; provided surface mapping technology integral to CERCLA removal action.
- Buried Waste—demonstrated subsurface mapping of an actual buried waste site.
- Waste Facilities Operations—planned and developed technology for new waste-handling facilities.
- Contaminant Analysis Automation—designed and produced key standard laboratory modules for automating EPA methods.
- D&D—pursued robotics applications for increased productivity, reduced exposure, and minimized secondary waste.
- Waste Minimization—demonstrated automation of plutonium/uranium processing steps.
- Crosscutting and Advanced Technology—applied generic (standardized) controller in all major demonstrations.

Robotics Milestones and Indicators of Progress

In the near future, EM robotic efforts are expected to include:

- Waste Storage Tanks—test remotely operated articulated arm at Hanford Cold Test Facility, procure and test waste retrieval system for Fernald silos, and demonstrate waste tank inspection at Idaho National Engineering Laboratory.
- Buried Waste—demonstrate advanced Remote Characterization System and waste downsizing and retrieval at the Idaho Surface Disposal Area.
- Waste Facilities Operations—demonstrate and test narrow aisle mobile robot Stored Waste Inspection System, install and test drum opening and emptying system, and develop remote TRUPACT handling system.
- Contaminant Analysis Automation—complete EPA validation of Standard Laboratory Modules and continue their development for chemical preparation of radioactive samples.
- D& D—develop robotic asbestos pipe insulation removal system and remote/modular/mobile robots for characterization, with multiple sensor capabilities; decontamination, reconfigurable for metals and concrete decontamination; and dismantling, with multicutting capabilities.
- Waste Minimization—Develop automated/ teleoperated glovebox for handling/processing high-level radioactive wastes.
- Crosscutting and Advanced Technology—developed modular robot arm mechanisms to facilitate maintenance.

Environmental and Molecular Science Laboratory

The Environmental and Molecular Science Laboratory will be a 200,000 square foot laboratory facility to provide directed research capabilities for the Hanford EM mission. The facility will house approximately 210 permanent scientific and support staff and 60 visiting scientists. An initial complement of research equipment, computer hardware, computer networking, and computer interfacing are provided for conducting a broad spectrum of research on environmental phenomena and environmental remediation. The focus of intended research tasks was developed during a four-year process beginning in 1987. The initial research plan was based on decades of environmental restoration and waste management experience that focused on site characterization, environmental monitoring, waste destruction, transport of toxic materials, and acid rain research and modeling. Construction is scheduled to start during the third quarter of FY 1993, with beneficial occupancy in the fourth quarter of FY 1995 and operations startup by the beginning of the second quarter FY 1996.

Emergency Management

DOE's transition from weapons production to environmental restoration and waste management fostered the need for an EM Emergency Management Program. Although fewer than two years old, this program has established a new awareness within EM. The program provides centralized management of emergency planning, preparedness, and response activities. These functions are segregated into three major areas: the Transportation Emergency Preparedness Program, the Facility Emergency Preparedness Program, and the EM Occurrence Notification and Reporting Program.

The Transportation Emergency Preparedness Program ensures a DOE-wide capability for responding to and mitigating incidents involving DOE shipments/cargo, including radioactive and other hazardous materials of a nonweapons nature. The Facility Emergency Preparedness Program provides support for the development, implementation, maintenance and appraisal of emergency plans, systems and capabilities of EM facilities. The Occurrence Notification and Reporting Program provides a notification system through which Headquarters management and staff are informed rapidly of any occurrence at a DOE facility and ensures proper followup action by EM personnel.

Emergency Management Accomplishments

The Transportation Emergency Preparedness Program was the first established emergency management program within EM, and it has had substantial impact. The program is driven by a strategy for management of nonweapons-related transportation emergencies. TRANSAX-90 (a full-field exercise involving a simulated transportation accident involving a TRUPACT-II) was the first opportunity to put the program strategy into practice. The exercise has fostered cooperation with State, Tribal, and local governments. Additional training opportunities are also connected with a program known as WIPPTREX, a series of training sessions and exercises along the Waste Isolation Pilot Plant transportation corridor.

External coordination mechanisms exist through EM participation in the National Response Team, the Federal Radiological Preparedness Coordinating Committee, and the Hazardous Materials Transportation Uniform Safety Act Interagency Coordination Group. EM also works in conjunction with the Office of Civilian Radioactive Waste Management to solve common transportation-related problems with State and local government representatives through the Transportation External Coordination Working Group.

A one-year-old training program continues to grow and now includes First Responder Orientation, a Radiological Emergency Response Operations course, and a Radiological Assistance Program Transportation Incident Response Course.

EM established the Facility Emergency Preparedness Program during 1991 to address the need for expanded emergency planning, training, and exercising.

This area is expected to grow rapidly as procedures for implementing operating requirements become formalized and exercises improve capability. Under this new program, Headquarters has structured response activities if an emergency occurs at an EM site. The Operational Emergency Management Team has been trained, and training exercises have been performed. Publications explaining program implementation, supplying training tools, informing the public, and providing internal guidance continue to add structure and uniformity to the program.

New DOE Orders require complexwide consistency in facility plans and procedures. Most EM facilities have submitted operating documents to Headquarters. Current reviews ensure consistency and uniformity across the DOE complex.

To increase safety and efficiency, these emergency preparedness programs support research focusing on the use of aerial surveys to map facility sites, transportation routes, accident scenes, and the applicability of the Atmospheric Release Advisory Capability to facility and transportation accidents.

The third emergency management area is the Occurrence Notification and Reporting Program, a system for reporting and processing occurrences across the EM complex. With the establishment of a daily, weekly, and monthly reporting system, management awareness and problem mitigation are becoming EM operating criteria. The Emergency Management Program is the central coordination point for their activity. Standard operating procedures have been implemented, and the Duty Officer Program interfaces with all EM management levels to keep managers informed of current field conditions.

All of the abovementioned activities lead toward the recognition of demonstrated capability on the part of DOE to deal with emergencies at sites and in transit, leading to increased public confidence, a major EM long-range goal.

Emergency Management Milestones and Indicators of Progress

Progress in establishment, acceptance, and espousal of an active emergency management system is evident throughout EM. Two Headquarters EM Operational Emergency Management Teams have been established. One was trained extensively for TRANSAX-90 and performed successfully in a simulated exercise. The second team trained and exercised during FY 1992. Additional projected and scheduled exercises, plus annual retraining, will continue to improve proficiency.

Communication links between EM and other Federal agencies, States, and Tribal and local governments continue to improve through exercise planning and participation, as well as through EM involvement in committee and task forces dealing with emergency management interests. With this as a foundation, EM plans to deepen its commitment and involvement with other Federal agencies and levels of government. Additional planning documents, procedures, evaluations, and informational documents will add further structure, form, and function to the basic programs now in place. Many activities, both developmental and maintenance, are still needed to meet DOE Order requirements. As the initial phase of the EM Emergency Management Program comes to a close and implementation procedures are put in place, the need increases for a self-correcting, self-assessment capability.

Emergency Management Issues and Strategies

Several issues affect the Emergency Management Program. For example, new DOE Orders require the establishment of a verification, reporting, and assessment system for several aspects of the emergency management system, but guidance is still being established and both funding and personnel are limited. In addition, the relationship between field locations and Headquarters management necessitates the involvement of more than one program office at all Field Offices. To avoid confusing directions, duplicative efforts, and unclear lines of authority, agreements must be put in place, cementing the relationship between the primary program office and all collateral program offices. Efforts are now under way to establish Memoranda of Agreement, which will clarify roles and responsibilities.

Successful regulatory compliance requires development of an effective strategy for requirements analysis, procedures for corrective actions, and Memoranda of Agreement among the EM Program Secretarial Officer, other Program Secretarial Officers, and EM Field Office Managers. Headquarters review of field plans, an interactive incident reporting system, training classes, and exercising of emergency management teams and personnel are guiding EM toward an improved regulatory compliance posture. Continued expansion of this effort will increase awareness and good practices.

Rapid, accurate reporting of events and incidents is imperative for a responsible program. A centrally managed Occurrence Notification and Reporting Program ensures that EM has met DOE Order requirements and is communicating in a coordinated and consistent manner on emergency preparedness issues. Furthermore, implementation of an objective self-assessment system will provide internal checks and balances required for a comprehensive program.

A controlled, coordinated Transportation Emergency Preparedness Program for DOE is needed to ensure an improved capability to carry out responsibilities. Although many elements of an adequate emergency preparedness program were previously in place, capabilities for responding to transportation emergencies were fragmented and duplicative. This centralization of emergency preparedness activities has combined multiple transportation programs under a unified management team, which eliminated overlapping responsibilities and many uncertainties.

These strategies are designed to build on the initiatives already under way to further improve EM's capability to plan for, respond to, and mitigate any possible emergency that might occur during the completion of any environmental restoration, waste management, or nonweapons transportation operations.

2.4.5 EFFECTIVE TECHNOLOGY INTEGRATION AND ENVIRONMENTAL EDUCATION FOR ADDRESSING EM NEEDS

Efficient technology integration delivers innovative U.S. and foreign technologies to DOE for use and to the private sector for commercialization; environmental education and development ensures that DOE's work force has the skills, knowledge, and training to carry out its mission now and in the future.

Technology Integration and International Technology Exchange Programs provide DOE with information, knowledge, concepts, and technology from domestic and international sources.

Technology integration seeks to achieve three goals: to gain access to appropriate knowledge, processes, and technologies; to distribute those technologies to maximum effect across the DOE complex; and, if successful, to facilitate their use elsewhere, either in the United States or abroad (Figure 2.4.5). Efforts in technology integration foster U.S. industrial competitiveness, secure U.S. leadership in advanced environmental remediation technology, bolster U.S. economic strength, create more professional and technical jobs, and increase the standard of living.

The Environmental Education and Development Program seeks to develop a scientific, technical, and educational system in support of retraining the current work force and ensuring that an appropriately educated work force will be available in the future. This is accomplished through collaboration with education and training communities throughout the country, including teachers and students in environmental science and technology programs from kindergartens through graduate schools. These programs include (1) kindergarten through grade 12 outreach, designed to enhance mathematics and science education activities to attract and encourage students toward environmental career opportunities; (2) interactions with two-year institutions to support certificate and associate degree programs for environmental technicians; (3) national university awards, scholarships and fellowships to attract faculty and graduate/undergraduate students toward environmental management challenges; (4) internship and apprenticeship programs to match qualified students with potential EM employment opportunities; (5) academic partnerships with university consortia to develop environmental curricula; conduct related research; establish student, faculty and scientist exchange programs (international and national); and initiate cooperative efforts between academia, government, industry, and the laboratories on mutual environmental restoration and waste management goals; and (6) additional education initiatives that focus on public environmental literacy to promote EM-wide education and career opportunities and to increase the general public's knowledge of science and environmental issues involved in EM's cleanup efforts.

Training and development activities focus primarily on assessing work force needs throughout the DOE complex, defining the training/retraining needed to transition current DOE employees into EM positions and upgrading the skills of existing EM workers, determining training programs that already exist (domestically or abroad) to meet EM training needs, and finally, developing and institutionalizing new programs with community colleges, universities, and other training institutions.

Accomplishments

The Technology Integration Programs established mechanisms for technology transfer and developed an innovative acquisition strategy for technology development. Seven licenses were awarded to companies for horizontal well drilling technology, which was tested successfully in the first Integrated Demonstration. This technology was then transferred to the U.S. Air Force.

The capability for mobile, real-time, heavy metals sampling, screening, and analysis at field sites was developed. With this capability, sampling and analysis costs can be reduced from $4000 to $500 each, and time requirements reduced from 90 days to about 15 minutes. The potential overall savings is $100 million per year, with the work being completed in one year instead of ten, as would be needed with current sampling and analysis technology.

Meetings with industry to improve public/private sector partnerships and to address barriers to effective communication and acquisition provided the impetus for EM to develop its acquisition policy and solicitation tools. A Small Business Technology Integration Program was established to provide applied research and development opportunities to small firms to facilitate the use of innovative cleanup technologies in environmental restoration and waste management programs.

The Technology Integration Program has participated in DOE's Technology Transfer Planning Group, along with representatives of other DOE technology transfer programs. The Planning Group coordinates individual technology transfer programs and policies to reduce overlap and obtain maximum leverage of technology transfer program resources.

The International Technology Exchange Program established mechanisms to effect technology transfer across U.S. borders, an institutional and legal structure to import international technologies, and a data base for information management that matches U.S. needs with international technologies and international markets with U.S. technologies.

Nine bilateral cooperative projects were initiated with Japan, the United Kingdom, Belgium, France, and Germany to address specific environmental restoration and waste management needs, such as site characterization and soil stabilization, soil and groundwater remediation, and waste treatment. Conferences and workshops, bilateral and multilateral, further international communications.

The Environmental Education and Development Program completed a needs assessment of EM human resource requirements to facilitate necessary training and development at each DOE site. Three academic partnerships are in place involving 25 colleges and universities nationwide, expanding both the scope and breadth of the EM educational effort. Some 50 graduate student fellowships and 100 undergraduate scholarships are awarded annually.

Support to community colleges was expanded to help develop technicians to work at DOE sites and for training population segments not traditionally reached. Effective outreach programs continue to improve precollege science and mathematics curricula and currently reach more than 150,000 students and 5500 teachers.

Milestones/Progress Indicators

Successful technology integration requires improved cooperation and collaboration with the environmental management industry. As technologies are proven, transfer to other EM organizations and to the private sector are major milestones. The goal is to work with industry to bring in and transfer out successful technologies; to transfer technology systems for faster, better, safer, cheaper environmental restoration and waste management; and to ensure EM's current work force has the proper technical training to meet its mission.

The progress indicators for International Technology Exchange are: (1) transfer of off-the-shelf international technology for U.S. use to avoid development costs, (2) reduction in costs to the U.S. by sharing costs with international partners, and (3) providing opportunities for U.S. firms abroad.

Education and training programs must ensure that scientific and technical human resources are available when needed. Environmental education and training programs must reach all levels of the educational system. When students' interest in mathematics and science are captured early, they are more likely to pursue careers in scientific and engineering fields. When educational institutions collaborate to develop programs in response to DOE needs, the U.S. leadership role in waste management and environmental restoration technologies is ensured.

Issues/Obstacles

The Technology Integration Programs face several obstacles to prompt an effective integration of relevant technology in, across, and out of the DOE complex.

The Federal acquisition process discourages industry's participation in technology development. Issues about intellectual property rights and patents are raised when competitors have access to concepts or products under development.

Regulatory requirements frequently become barriers to the acquisition of U.S. domestic and international technologies when technology is transferred into DOE. When DOE attempts to transfer technology out, regulatory requirements of other countries must be considered.

Dynamic missions, technologies, regulatory structure, and demographics present multiple challenges for education and training programs.

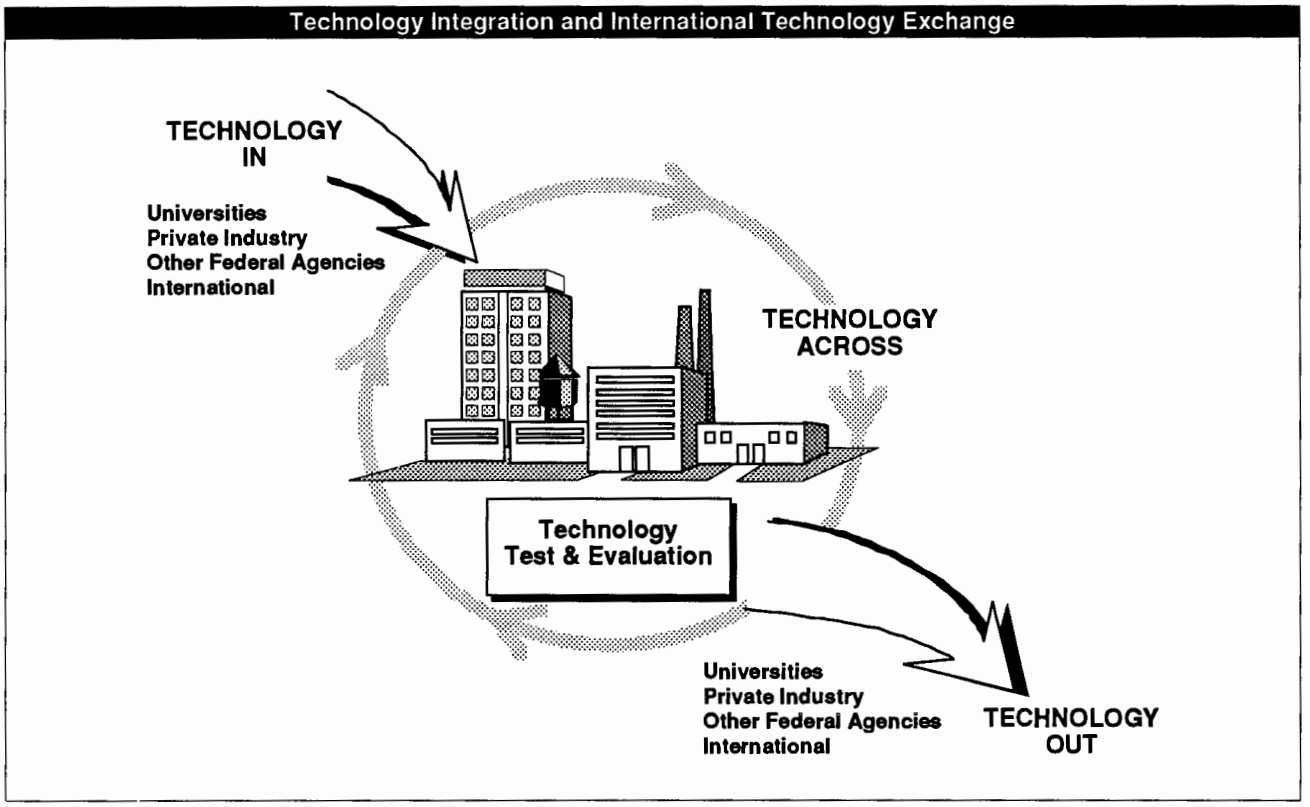


Figure 2.4.5. Components of the Technology Integration and International Technology Exchange Programs.

Strategies

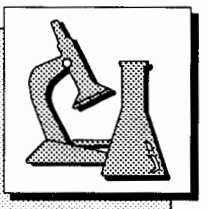
Essential to accomplishing its mission, EM must establish the internal planning controls to ensure that the right technology and human resource needs are satisfied in a timely fashion.

Collaborative efforts with industry, academia, and international technology is key to DOE's strategy. Sharing information with industry, including small businesses, through networking, conferences, and exchanges, reinforces credibility and mutual understanding of technical needs. DOE will work with other Federal agencies and multilateral bodies to level the playing field in cooperative ventures with international industry and academia.

Education and training efforts will be supported by financial assistance for research on EM priorities, environmental education enhancement, and technology integration. Activities to reach students when most impressionable, stimulating interest in science and technology, will be the thrust of the efforts. Outreach efforts to help stakeholders better understand DOE and its needs, plans, and accomplishments will generate the support DOE needs to perform its mission.

Special programs for demographically and culturally diverse groups that are now underrepresented in engineering and science will be conducted. These people will become an increasing share of the future EM work force and a significant portion of the labor pool surrounding cleanup sites. Supportive educational initiatives will continue to ensure that the current work force has the skills and capabilities to perform site cleanup and waste management activities.

2.4.6 PROGRAM MANAGEMENT TO EXPEDITE TECHNOLOGY DEVELOPMENT



The role of program management is to expedite technology development without directing its course, identifying what must be developed and defining the measures of success without controlling the methods of development.

Responding to EM customer needs is facilitated by a management infrastructure involving Headquarters and field personnel. This infrastructure enables EM to mobilize strong participation by other Federal agencies, industry, academia, and DOE national laboratories. In general, Headquarters' responsibilities for program management involve policy development and program planning, budget formulation, and program evaluation. Field Offices define tasks and activities to accomplish programs, recommend program change, implement authorized activities, and monitor program execution. All activities are performed using the principles of the DOE Project Management System.

Complementing the management infrastructure are the management tools—including plans, procedures, and resources (personnel and facilities)—used to expedite technology development. Management tools are developed and implemented to promote effective planning, budgeting, and evaluation of the Technology Development Program and to facilitate its links to other EM programs at Headquarters and in the field. These tools include information systems that help analyze program activities to determine trends that require management attention and to disseminate lessons learned.

To carry out its technology development responsibilities, each Field Office has appointed a technical program officer to serve as the primary contact between that office and Headquarters program managers. Each national laboratory or major DOE support contractor performing work in conjunction with the Technology Development Program has appointed a technical program manager to be the principal contractor contact and to coordinate technology development activities performed by the national laboratory or contractor. The technology program manager reports to the Technology Program Officer for programmatic direction and guidance.

Accomplishments

To ensure greater understanding of problems facing Headquarters and field operations, a limited number of government and contractor field personnel have been invited to serve at Headquarters for periods generally not exceeding 12 months. The Technology Development Program has also continued the development of management planning documentation. The Technology Development Management Policies and Requirements document provides needed policy guidance to Headquarters and field management. A technology development management plan has been initiated to document established and developing management processes and systems. These efforts have been accomplished with both Headquarters and field involvement and interaction.

Among other notable accomplishments, automated financial management information systems were developed to control funding allocations, and standard operating procedures were developed for financial management processes. A Technical Task Plan electronic tracking system was designed and developed, and a system was implemented for

preparing and submitting Technical Task Plans in an electronic format to Headquarters. The preparation and use of Activity Data Sheets for technology development planning was initiated, resulting in greater uniformity of Five-Year Plan development procedures across EM. Cooperative efforts among the primary EM programs resulted in a consensus "EM Technology Management Process," which is nearing finalization. Development is progressing on a set of common standard operating procedures.

Milestones and Indicators of Progress

Program management milestones and progress indicators include the following:

- completing the Technology Development Management System based on the Technology Development Management Policies and Requirements document,
- developing a Technology Development Strategic Investment Plan,
- developing a Technology Development Management Plan,
- developing Technology Development Standard Operating Practices and Procedures,
- developing a Technology Development Records Management Program,
- formalizing a Value Engineering Program within the Technology Development Program,
- educating program technical personnel in value engineering practices and benefits,
- standardizing the Technical Task Plan cost-estimate documentation and quality,
- developing reporting requirements for cost-estimate backup data and rationale and performing independent cost-estimate reviews,
- coordinating defensible cost-benefit analyses for technology development projects,
- generating standardized cost-estimating methodologies that link investments in technical research projects and proposed savings in current remediation practices,
- supporting development of Phase II of the Progress Tracking System,
- providing training of cost and schedule performance measurement and control system criteria, and
- distributing a fully functicnal electronic input system for preparing and submitting Technical Task Plans. (This system will standardize the Technical Task Plan format and improve the tracking of submittals to Headquarters. This system provides the capability to interface the Technical Task Plan baseline performance and funding data with the EM-wide Progress Tracking System.)

2.4.7 TECHNOLOGY ISSUES AND THE STRATEGIES TO RESOLVE THEM

To capitalize on the opportunity to field innovative technology systems for environmental management, EM technology development efforts must pursue a strategy to resolve a variety of issues.

Balancing Near- and Long-Term Needs

Technology development activities support the DOE cleanup mission. These programs are highly focused efforts, balancing near-term and long-term research needs. Near-term efforts will concentrate on (1) developing and demonstrating technologies to provide solutions for interim control or containment of contaminants and (2) providing incrementally improved technologies for near-term implementation. Long-term efforts will search out technologies that provide revolutionary improvements in cleanup capabilities.

Public participation is an essential element in cleanup decision making. Although this participation is often difficult and time-consuming, slows technology integration, and inhibits quick cleanup solutions, it is essential to the success of the cleanup mission. Thus, EM is committed to more and better public involvement, with greater emphasis on institutional and outreach programs. A number of organizational elements within EM are devoted to these programs. They are essential for informing the public of DOE cleanup plans, technology needs, accomplishments and building support for the DOE mission.

The 1991 Office of Technology Assessment report, *Complex Cleanup*, stated that "analyses show that it may be impossible with current technology to remove contaminants from certain groundwater plumes and deeply buried soil or, even if possible, it may be extremely expensive or require prolonged periods of operation." Depending on the scale of contamination and whether contaminant migration poses, or will soon pose, health or environmental risks, the need for action may be immediate. In these cases, there is little or no time for technology development. The only recourse may be to compress the time for obtaining regulatory approval and informing and involving all potential stakeholders (e.g., the public and Tribal, State, and local governments, and other government agencies).

Cleanup requirements associated with the public's demand for essentially unrestricted land use may place excessive technical requirements on the technology developers. A number of problems must be resolved to succeed in meeting public demands:

- Newly proposed treatment methods for land disposal restrictions waste streams must be accepted as Best Demonstrated Available Technology.
- Thermal treatment technologies, including incineration, must be accepted by the public and regulatory authorities.
- De minimis or inconsequential values must be established for hazardous and radionuclide wastes below which no action needs to be taken.
- In situ remediation techniques having significant safety and economic advantages must be accepted by the public and regulatory authorities. Until these problems are resolved, the degree of "unrestricted land use" that might be achieved remains highly uncertain.

Establishing Links to Diverse Elements of Society

The first step of the Technology Development Program's strategy is to establish effective links with many sectors of society. Sharing information with industry enhances credibility and understanding of needs and solutions. Similar techniques will be used abroad, with the added dimension that DOE will seek, through other U.S. agencies and multilateral bodies, to level the international playing field.

Effective communication among technology developers and users is a key management strategy element that is being implemented. This communication is accomplished through periodic, carefully structured program reviews; accurate reporting of technical progress; dissemination of technical results; and coordinated scheduling of program management activities between Headquarters and Field Offices. These activities are coordinated at the Headquarters and Field Office levels.

Because cleanup solutions also originate outside DOE, tapping industry, academia, and the international community is essential. Leveraging DOE resources with theirs will stretch DOE's dollar. However, identification and implementation of promising technologies is hampered by a lack of information as to their existence and by Federal acquisition requirements and processes that are complex and inhibit the rapid selection of innovative technologies and raise industry's fears of loss of intellectual property. Regulatory requirements of other nations must also be considered. Trade laws, preferences given to domestic firms and products, restrictions on imports, and subsidies to key industrial groups hamper technology exchange. In short, the domestic and international playing field is not level. Programs are under way on both fronts to resolve existing problems.

The training aspects of the clean up face challenges of changing tasks, technologies, regulatory structure, and demographics. Over the next decade, new workers entering the U.S. labor force will need skills in mathematical, scientific, and engineering disciplines, which are now inadequately addressed. Further, many of the new workers will be from demographically and culturally diverse backgrounds, even less well addressed by the existing system. Links to existing universities, colleges, and consortia are equally important in realizing human potential. Universities can provide research as well as education. Precollege efforts reach students when they are most impressionable, to maintain interest in scientific disciplines for later payoff. Special attention will be paid to the educational needs of the demographically and culturally diverse groups that comprise a growing share of the future EM work force and a significant portion of the labor pool around each site.

Another major issue facing EM is the lack of sampling and analytical support. Environmental data required by EM programs to meet compliance agreements or other legal drivers cannot be provided in a timely manner. Efforts at the installation level are directed at forming strong contractual partnerships with the commercial sector and relying on it for a substantial portion of the DOE sampling and analytical support. Plans are to cooperate with other Federal agencies such as EPA and the Department of Defense to develop uniformity of programs that will promote efficient use of scarce analytical resources until improved capabilities can be provided. A related issue involves radioactive mixed waste. Virtually nowhere outside government facilities is it possible to research alternative technologies for radioactive mixed waste treatment, storage, and disposal. Licensing and safety requirements are the principal impediments to private efforts in this area.

Planning and Prioritizing Technology Activities

To accomplish its mission, DOE is establishing accurate planning projections to ensure that innovative technology and human resource needs are satisfied by appropriate and timely solutions. Standardized documentation of cost estimates and cost-benefit analyses for all technical tasks provides the information required to assess an activity's proposed effectiveness and investment risk. Project prioritization is improved when documentation is provided from the field in a consistent format. Fully documenting the cost estimate's ground rules and assumptions provides a more informative rationale of the funding requirements. Documented procedures clarify and enhance the effectiveness of technology development management. Planning documents inform the appropriate personnel when and what information is required, thereby improving staff productivity. Similarly, establishment of consistent Headquarters procedures, along with training of the program management staff in their implementation, will enable the staff to effectively analyze project schedule and cost performance reports.

The Technology Development Program will continue to place emphasis on adapting existing characterization, monitoring, retrieval, treatment, and disposal technologies to the specialized needs posed by mixed radioactive/hazardous wastes. However, it will also aggressively pursue new technologies through research and development efforts in selected areas where acceptable technologies do not exist.

Factors affecting the research, development, demonstration, testing, and evaluation schedule and resource allocation priorities are

- risk to human health and the environment,
- source of contamination,
- characteristics of the contaminants,
- natural transport and dispersal processes, and
- current availability of adequate characterization, remediation, and monitoring technologies.

The complexity of the technical problem requires a concerted effort to set priorities and establish the most beneficial balance and schedule for technology development. The host of problem contaminants includes volatile and nonvolatile organics, nonaqueous-phase liquids, toxic substances, hazardous materials and metals, radionuclides, and high-explosive materials. These contaminants are found in groundwater and surface water and in arid and nonarid soils (with associated uncertainties of water and contaminant flow in fractured or porous media). Waste forms vary from liquids to sludges and slurries to solid waste forms.

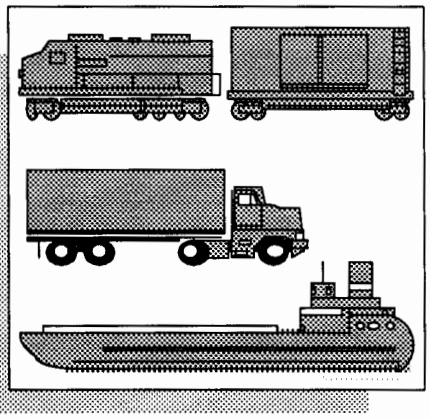
Minimizing the Generation of Waste

An integrated strategic plan, or roadmap, is being developed that includes the Environmental Restoration Program, the Waste Management Program, and Defense Programs activities and requirements. Associated technology development activities and goals to identify technologies, funding, and schedules are included. A goal has been established to reduce waste production in the weapons complex by 60 to 80 percent. To achieve this goal, the Technology Development Program coordinates research and development activities with Defense Programs on weapons design, materials substitution, and process modification for production and dismantlement.

EM will develop, test, evaluate, and transfer technologies that

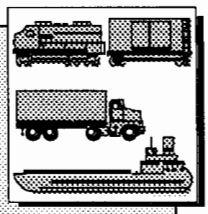
- conserve, substitute, and recycle expensive and hazardous materials throughout the nuclear weapons complex and research and development laboratories;
- reduce the amount of radioactive material disposed of as waste;
- reduce air emissions of chlorinated hydrocarbons; and
- reduce risks to production workers and the cost of production.

Eliminating or minimizing the generation of waste at the source is the primary goal, not only within the weapons complex but throughout the entire DOE complex. Presently, the Waste Management Program is responsible for the removal, treatment, and disposal of these wastes. Attention is now turning to the processes that produce these wastes. As in the weapons complex, the objective is to establish a collaborative effort between the waste generators and the Waste Management Program to eliminate or reduce these wastes.



Transportation Management

2.5.0 TRANSPORTATION MANAGEMENT: A PROGRAM OF DEPENDABLE DOE-WIDE SUPPORT



DOE facilities cleanup and waste management activities depend on a transportation system that provides for (1) safe, efficient, and economical shipments following strict regulatory requirements, and (2) well-planned, innovative, efficient, packaging designs and transportation systems.

The Transportation Management Program supports the needs for all of DOE. Of the more than 400,000 commercial shipments that DOE made in FY 1991, 96 percent was nonhazardous shipments needed to construct, maintain, and operate DOE offices and facilities. The remaining four percent was hazardous material shipments, with less than half being radioactive materials shipments. Shipments of medical and research radioisotopes, uranium compounds, and empty packagings accounted for more than 70 percent of DOE's radioactive materials shipments. (Figure 2.5.0).

Transportation Assessment and Integration (TRAIN) Study

Because of the shift in DOE focus from weapons development to site restoration, a need arose for a comprehensive evaluation of DOE's transportation and emergency management requirements for the next decade and beyond to ensure that future programmatic transportation needs will be met. Through a combination of workshops and other investigations, a comprehensive long-range strategy was developed. The final report was published in August 1992. The TRAIN report provides an in-depth evaluation of emerging transportation trends and ways in which EM's Transportation Management Program can ensure capabilities to meet anticipated needs. The advent of transportation technologies, fundamental changes in the regulations for hazardous materials, and a significant amount of new materials for which packaging will be needed will require an innovative approach to providing flexible, efficient, and safe transportation. The Transportation Management Program will meet this challenge by continuing to evaluate the regulator and programmatic environments and by maintaining or developing required capabilities. The action plans in the report provide the basis for defining strategies to effectively integrate transportation-related activities with programmatic needs within EM, as well as throughout the DOE complex. The Transportation Management Program is initiating activities to implement these action plans.

Transportation Management Program

DOE conducts most of its shipping operations through DOE Field Offices throughout the United States. DOE programs, including cleanup of facilities and waste management activities, depend on an ability to ship hazardous and nonhazardous materials in a safe, efficient, and publicly acceptable manner meeting regulatory requirements. Transportation operations are conducted under the packaging and transportation regulations of all applicable international, Federal, State, Tribal, and local regulations.

Transportation Management responsibilities include activities in Transportation Logistics, which (1) sets DOE policy and establishes procedures in compliance with applicable regulations for the safe, efficient, and cost-effective transportation of all DOE materials, including hazardous materials

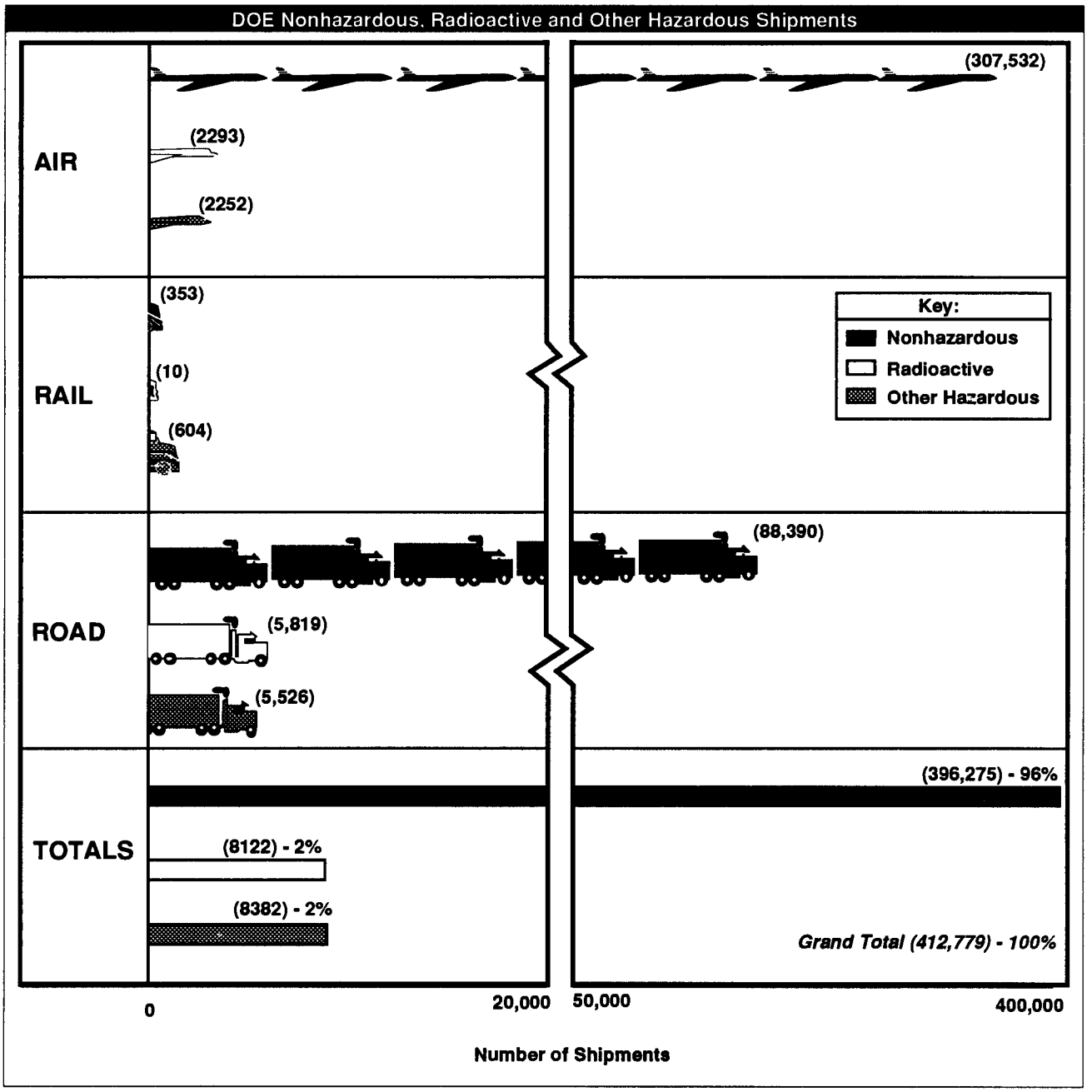


Figure 2.5.0. Number of DOE nonhazardous, radioactive and other hazardous shipments made in FY 1991 (does not portray relative risk of shipments).

(particularly radioactive), substances, and wastes, (2) develops and provides professional development and regulatory compliance training, and (3) develops and implements transportation automation activities. Also included are activities in Transportation Technology Development, which is responsible for developing innovative packaging, packaging components and transportation management systems. Transportation Management also conducts risk assessments for compliance with the National Environmental Policy Act and other regulations. The Transportation Management activities are closely coordinated with the Liaison and Communications Staff to facilitate opportunities for information exchange, issue identification and resolution, and public input into transportation management decisions.

2.5.1 MANAGING TRANSPORTATION ACTIVITIES TO MEET THE CHALLENGES OF ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT

The Transportation Management Program is preparing to meet the challenge of the EM mission by integrating early packaging and transportation planning into EM activities to ensure that appropriate capabilities are available when needed.

DOE programs have relied on safe, efficient, and economical transportation and packaging systems as essential elements in support of their program activities, even as their missions and responsibilities have evolved and changed. The Transportation Management Program is preparing to meet the challenge of DOE's new missions through early integration of transportation management planning and transportation-related activities with programmatic needs with EM, as well as throughout the DOE complex, to ensure appropriate transportation and packaging capabilities are in place when needed (Figure 2.5.1).

The Transportation Management Program provides DOE-wide support by ensuring that all DOE materials, including hazardous materials (particularly radioactive), substances, and wastes, can be efficiently and economically transported on schedules that enhance safety and support mission accomplishment.

This program is comprehensive and includes

- identification of transportation requirements for planning purposes,
- development of needed packaging and transportation systems,

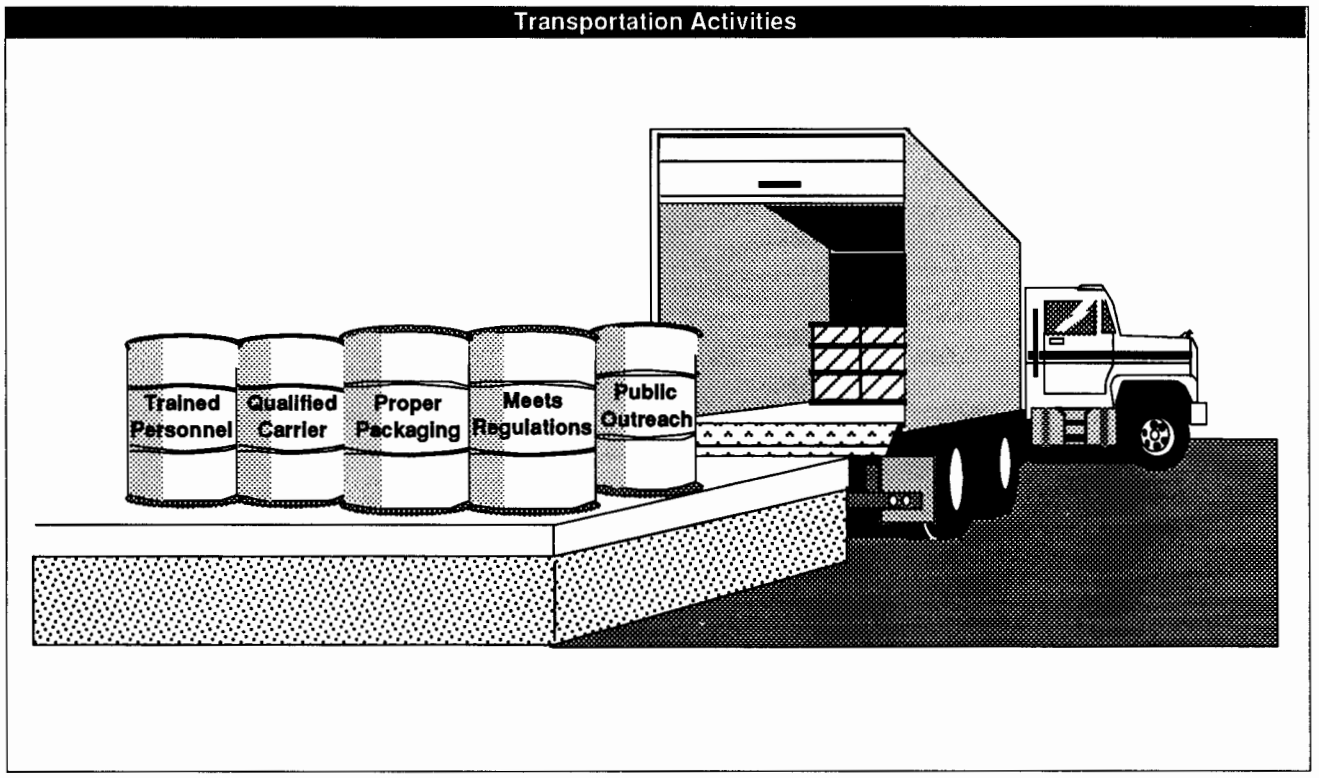


Figure 2.5.1. A DOE shipment consists of many factors.

- development of human resources and knowledge necessary to support safe and legal operations development and implementation of automation of transportation activities, and
- performance of transportation operations.

An important element in transportation operations is the effective coordination with the Liaison and Communications Program, which fosters other Federal agencies, States, localities and Tribes in dealing with transportation-related issues.

Focus Areas for Transportation

DOE's Transportation Management Program consists of two primary focus areas: Transportation Logistics and Technology Development. The integration of each of these areas into DOE-wide programs is directed at developing essential components that provide successful transportation operations systems.

Transportation Logistics is responsible for activities directed at anticipating and providing the support necessary to successfully perform transportation operations. The complex and changing composition of transportation in today's marketplace necessitates innovative approaches be used to ensure operations that continue to be cost-effective, efficient, and in compliance with increasingly stringent regulations. Major components of Transportation Logistics consist of the following activities:

- developing and providing transportation operational capabilities, including establishing DOE-wide Orders, performing operational analyses, conducting freight rate negotiations, evaluating carriers, and performing functional appraisals;
- developing and providing training to support the maintenance of a highly trained group of transportation professionals who can successfully deal with the broad spectrum of transportation issues, especially transporting hazardous materials, substances, and wastes;
- providing package designs for hazardous materials that continue to comply with changing regulatory requirements and providing and managing a system to review explosives classifications to ensure compliance with explosives regulations;
- developing and providing automation of operational systems and data bases to improve operational efficiency, information management, and reliability, including adopting technologies to take advantage of improvements occurring in the transportation services sector of private industry;
- improving capabilities to ensure compliance with regulatory drivers through technical assistance, assessments, and evaluations; and
- implementing improvements in integrating program activities.

Technology Development consists of activities directed at developing and applying innovative technologies to solve critical packaging problems. A base technology program provides a broad range of capabilities to support package design development and certification activities. Technology Development is responsible for the following activities:

- developing and providing analytical codes to aid in prediction of packaging responses to normal and accident conditions to demonstrate compliance with applicable regulations;
- ensuring that facilities and instrumentation are developed and available to support the testing and data collection necessary to obtain package design certification;
- investigating and developing new systems and components to improve package designs;
- providing design, testing, and analytical support in obtaining package design certification;

- addressing technical and regulatory issues in a timely manner;
- developing and providing capabilities to analyze transportation systems for radiological and nonradiological risk, routing, and other logistical considerations; and
- developing package designs to support DOE missions.

Accomplishments

Transportation Management has been in existence since the early 1960s. Transportation Management has been very successful in identifying and addressing a myriad of issues confronting the transportation of materials necessary to support DOE's (and its predecessors') objectives and programs.

Transportation Logistics has successfully developed and implemented several initiatives during the past year. A series of training courses has been developed and implemented on regulatory requirements for the safe packaging and transportation of hazardous materials and related issues, such as tiedowns. The Motor Carrier Evaluation Program was developed and implemented to evaluate carriers for performance and service and to assist DOE and contractor traffic staffs in using only "highly qualified" carriers. DOE-wide less-than-truckload rates were negotiated and implemented, thereby avoiding the use of an excessive number of carriers and subsequently reducing costs. Through litigation, Transportation Management obtained a favorable decision from the Interstate Commerce Commission on the illegal use of "special trains" and rail rates assessed DOE resulting in the return of $18 million to the Treasury Department. Efforts to automate transportation functions include automated tools for selecting the best motor carrier on the basis of cost and service; satellite tracking of high-visibility shipments (TRANSCOM); and automated information collection to support rate negotiation and shipping analyses. Activities have been initiated to develop enhanced regulatory compliance tools (including computer-based aids), a professional development ladder for transportation personnel, and an Automated Transportation Management System to consolidate logistics information management and enable coupling to carrier technologies for cost efficiency. Efforts have begun to evaluate the feasibility of centralizing selected packaging and logistics functions and to ensure that transportation planning and support are integrated into EM program activities.

Technology Development accomplishments include

- establishing a Task Group to develop a National Environmental Policy Act strategy for transportation. This internal group is tasked with the examination of the transportation impacts of the PEIS, and has external oversight by the Environmental Restoration and Waste Management Advisory Committee;
- developing a program plan for the Hazardous and Mixed Wastes Needs Assessment;
- initiating development of the Survey of Transport of Radioactive Materials and the DOE Transportation Risk Study for support of the Environmental Analysis Document;
- completing the Ductile Cast Iron Cask Drop Tests (began phaseout of the Ductile Cast Iron Cask program);
- completing the development of the Mobile Instrumentation System Trailer for Radioactive Material Packaging Tests and fielding the trailer in Germany for support and benchmarking of the Cask Drop Tests;
- continuing the Transportation Packaging Needs Assessment; and
- obtaining the Certificate of Compliance for the Beneficial Uses Shipping System cask to ship cesium chloride and strontium fluoride capsules.

Transportation Management Milestones and Indicators of Progress

In the near term, ongoing activities will continue to provide their contributions to the accomplishment of DOE's transportation requirements. A key element to ensuring that the transportation management program remains current with evolving problems and issues has been the development of the Transportation Assessment and Integration report, which provides a base strategy for future transportation initiatives and activities.

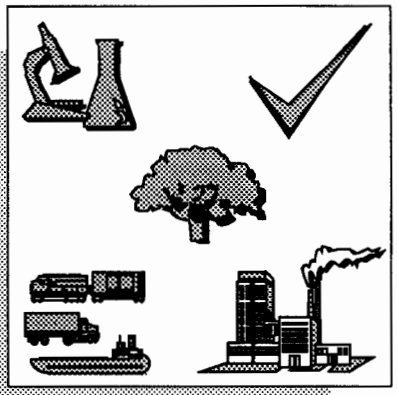
Also, through the development of a Headquarters Transportation Management Roadmap, transportation activities will be better coordinated within EM site cleanup activities, waste minimization, etc. Emphasis will be placed on regulatory compliance for future transportation initiatives, as well as on developing training programs to educate those involved in transportation logistics.

Transportation Management Issues and Strategies

Transportation Management faces the continuing challenge of a rapidly changing regulatory and business environment. It must keep abreast of anticipated changes, plans for meeting them, and successfully dealing with them. Considerable effort is needed to ensure that a systematic approach is used to identify these needs and to avoid becoming reactive to them. A significant number of transportation-related operational problems will be resolved by early integration of transportation planning into EM and DOE-wide program planning including involving the public early on. At this time, initiatives (i.e., roadmap effort, training assessment) are being undertaken to meet this need. However, considerable integration and planning efforts are needed to ensure that all EM programs receive appropriate transportation support.

The TRAIN effort has resulted in identifying a base strategy for meeting DOE's transportation needs for the foreseeable future. The specific Transportation Assessment and Integration strategies for various aspects of Transportation Management will be accomplished through development of specific implementation plans and performance of activities in accordance with the plans. In some cases, development of products will be initiated or completed in FY 1993; while in other cases, assessments will be performed to determine the best way to proceed with development of the desired capabilities. The hierarchy of strategies provided by the Transportation Assessment and Integration and the implementing sections of the Transportation Management Program Plan combine to provide a detailed description of the directions necessary to accomplish the transportation objectives.

Transportation Management activities will continue to be closely coordinated with the Liaison and Communications Program. This will enable public input on our plans and activities and will provide the forum to explain our transportation management operations to the concerned public.



Appendices

APPENDIX A

Excerpts from the National Defense Authorization Act for Fiscal Years 1992 and 1993 Pertaining to the Environmental Restoration and Waste Management Five-Year Plan.

The following is Section 3135 of Public Law 102-190-Dec. 5, 1991, 102d Congress, 1st Session, entitled "*Environmental Restoration and Waste Management Five-Year Plan and Budget Reports.*"

Section 3135. ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT FIVE-YEAR PLAN AND BUDGET REPORTS

(a) FIVE-YEAR PLAN – (1) Not later than September 1 of each year, the Secretary of Energy shall issue a plan for environmental restoration and waste management activities to be conducted during the five-year period beginning on October 1 of the next calendar year, at (A) defense nuclear facilities and (B) all other facilities owned or operated by the Department of Energy. The plan also shall contain a description of environmental restoration and waste management activities conducted during the fiscal year in which the plan is submitted and of such activities to be conducted during the fiscal year beginning on October 1 of the same calendar year. Such five-year plan shall be designed to complete environmental restoration at all Department of Energy facilities not later than the year 2019.

(2) The Secretary shall prepare each annual five-year plan in a preliminary form at least four months before the date on which that plan is required to be issued under paragraph (1). The preliminary plan shall contain the matters referred to in paragraph (B) (other than the matters referred to in subparagraph (J) of that paragraph). The Secretary shall provide the preliminary plan to the Governors and Attorneys General of affected States, appropriate representatives of affected Indian tribes, and the public for coordination, review, and comment.

(3) At the same time the Secretary issues an annual five-year plan under paragraph (I), the Secretary shall submit the plan to the President and Congress, publish a notice of the issuance of the plan in the *Federal Register*, and make the plan available to the Governors and Attorneys General of affected States, appropriate representatives of affected Indian Tribes, and the public.

(4) The annual five-year plan, and the actions and other matters contained in the plan, shall be in accordance with all laws, regulations, permits, orders, and agreements. The plan shall contain the following matters:

(A) A description of the actions, including identification of specific projects, necessary to maintain or achieve compliance with Federal, State, or local environmental laws, regulations, permits, orders and agreements.

(B) A description of the actions, including identification of specific projects, to be taken at each Department of Energy facility in order to implement environmental restoration activities planned for each such facility.

(C) A description of research and development activities for the expeditious and efficient environmental restoration of such facilities.

(D) A description of the technologies and facilities necessary to carry out the environmental restoration activities.

(E) A description of the waste management activities, including identification of specific projects, necessary to continue to operate the Department of Energy facilities or to decontaminate and decommission the facilities, as the case may be.

(F) A description of research and development activities for waste management.

(G) A description of the technologies and facilities necessary to carry out the waste management activities.

(H) A description of activities and practices that the Secretary is undertaking or plans to undertake to minimize the generation of waste.

(I) The estimated costs of and personnel required for each project, action, or activity contained in the plan.

(J) A description of the respects in which the plan differs from the preliminary form of that plan issued pursuant to paragraph (2), together with the reasons for any differences.

(K) A discussion of the implementation of the preceding annual Five-Year Plan.

(L) Such other matters as the Secretary finds appropriate and in the public interest.

(5) The Secretary shall consult with the Administrator of the Environmental Protection Agency, Governors and Attorneys General of affected States, and appropriate representatives of affected Indian Tribes in the preparation of the plan and the preliminary form of the plan pursuant to paragraphs (1) and (2). The Secretary shall include as an appendix to the plan (A) all comments submitted on the preliminary form of the plan by the Administrator, Governors and Attorneys General of affected States, and affected Indian Tribes, and (B) a summary of comments submitted by the public.

(6) The Secretary shall include in the annual five-year plan issued in 1992 a discussion of the feasibility and need, if any, for the establishment of a contingency fund in the Department of Energy to provide funds necessary to meet the requirements in environmental laws, to remove an immediate threat to worker or public health and safety, to prevent or improve a condition where postponement of activity would lead to deterioration of the environment, and to undertake additional environmental restoration activities at Department of Energy defense nuclear facilities that are not provided for in the budgets for fiscal years in which it is necessary to meet such requirements or undertake such activities.

(7) The first annual five-year plan issued pursuant to this section shall be issued in 1992.

(b) TREATMENT OF PLANS UNDER NEPA – The development and adoption of any part of any plan (including any preliminary form of any such plan) under subsection (a) shall not be considered a major Federal action for the purposes of subparagraph (C), (E), or (F) of section 102(2) of the National Environmental Policy Act of 1969 (42 U.S.C. 4332(2)). Nothing in this subsection shall affect the Department of Energy's ongoing preparation of a programmatic environmental impact statement on environmental restoration and waste management.

(c) GRANTS – The Secretary of Energy is authorized to award grants to, and enter into cooperative agreements with, affected States and affected Indian Tribes to assist such States and tribes in participating in the development of the annual five-year plan (including the preliminary form of such plan).

(d) FUNDING – Of the funds authorized to be appropriated pursuant to section 3103, $20,000,000 may be used for the purpose of carrying out subsection (c).

(e) BUDGET REPORTS – Each year, at the same time the President submits to Congress the budget for a fiscal year (pursuant to section 1105 of title 31, *United States Code*), the President shall submit to Congress a description of proposed activities and funding levels contained in the annual five-year plan (issued, pursuant to subsection (a)(1), in the year preceding the year in which the budget is submitted to Congress) that are not included in the budget or are included in the budget in a different form or at a different funding level, together with the reasons for such differences.

APPENDIX B

How DOE Is Organized

Mission Of DOE

DOE has the responsibility for ensuring that the United States has sufficient energy to meet its future demands and for implementing programs and projects to move the country from its current state of energy management to the energy environment of the future. As such, DOE provides the framework for a comprehensive and balanced national energy plan through the coordination and administration of the energy functions of the Federal Government. DOE also plans, produces, transports, controls, maintains, reprocesses, and disposes of the nuclear weapons and fuels that are an integral part of both the defense and the civilian nuclear power production of this country. DOE also supports basic and applied research in the sciences, engineering, mathematics, and supercomputers and manages programs and projects implemented by government, the private sector, and private-public partnerships. These widespread responsibilities require DOE to work in a number of diverse areas, such as high energy physics or the development of energy efficient homes.

DOE Organization

DOE was established by the Department of Energy Organization Act (42 U.S.C. 7131), effective October 1, 1977, pursuant to Executive Order 12009 of September 13, 1977. The Act consolidated the major Federal energy functions into one Cabinet-level Department, transferring to DOE all the responsibilities of a number of programs from the Department of the Interior, the Bureau of Reclamation, the Interstate Commerce Commission, and the Departments of Commerce, Housing and Urban Development, and the Navy.

Specific DOE responsibilities include

- developing improvements in our current use of energy resources;
- conducting basic research in the sciences underlying efficient and effective energy use;
- protecting our society from the possible dangers of the by-products of nuclear plants, research medicine, and other applications;
- managing nuclear weapons production for strategic defense needs;
- delivering electric power through five power administrations;
- managing civilian and military petroleum reserves; and
- overseeing environmental restoration and waste management of DOE nuclear and nonnuclear facilities.

In addition, DOE develops and maintains information on energy reserves, energy production, and possible future energy needs for use by the private and public sectors.

DOE's organization, as depicted in Figure 1, includes the Economic Regulatory Administration, the Energy Information Administration, and the Federal Energy Regulatory Commission, which is an independent regulatory organization within DOE. Programs provided by DOE include Energy Research, Civilian Radioactive Waste Management, New Production Reactors, Environmental Restoration and Waste Management, Fossil Energy, Nuclear Energy, Conservation and Renewable Energy, and Defense Programs. DOE also consists of a number of support offices.

In addition to Headquarters' components, DOE has an extensive field structure that plays an integral part in the implementation and management of DOE projects and programs.

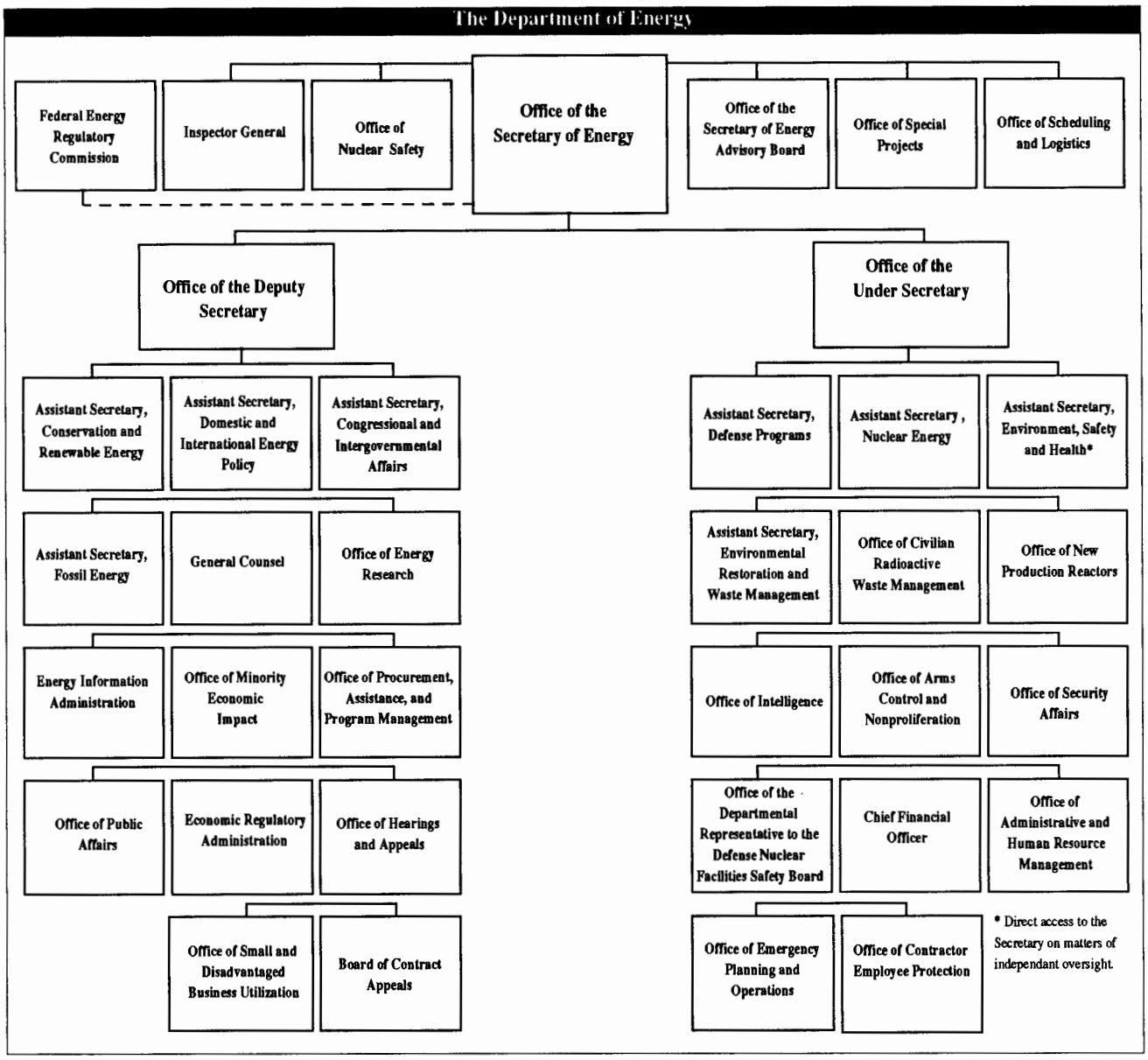


Figure 1

DOE and the Office of Environmental Restoration and Waste Management (EM)

The Assistant Secretary for Environmental Restoration and Waste Management provides program policy guidance and manages the assessment and cleanup of inactive waste sites and facilities, continues safe and effective waste management operations, and develops and implements an aggressively applied waste research and development program to provide innovative environmental technologies that yield permanent disposal solutions at reduced costs. The Assistant Secretary provides centralized management for DOE for waste management operations, environmental restoration, and applied research and development programs and activities, including EM policy and guidance to DOE Field Offices in these areas.

The Assistant Secretary for Environmental Restoration and Waste Management interacts with other programs and offices in DOE. While this interaction occurs with many other organizational elements, the primary programs or offices with which EM interacts are as follows:

- The Assistant Secretary for Environment, Safety and Health (ES&H) ensures that departmental programs are in compliance with environmental safety and health regulations and that environmental safety impacts of DOE programs receive management review. EM coordinates all activities with ES&H to ensure compliance with DOE and other regulatory requirements.
- The Assistant Secretary for Defense Programs (DP) directs the Nation's nuclear weapons research, development, testing, production, and surveillance program, as well as the production of the special nuclear materials used by the weapons program within DOE, and management of defense nuclear waste and by-products. As the Nation's requirements for defense production are decreasing, EM is accepting the responsibility of managing the restoration of DP facilities.
- The Assistant Secretary for Nuclear Energy (NE) administers DOE's research and development programs associated with fission energy. This includes programs relating to nuclear reactor development, both civilian and naval; nuclear fuel cycle; space nuclear applications; and uranium enrichment. The Assistant Secretary also manages DOE's Remedial Action Program to treat or stabilize radioactive wastes and perform decontamination and decommissioning at DOE surplus sites. In addition, the Assistant Secretary conducts technical analyses and provides advice concerning nonproliferation, assesses alternative nuclear systems and new reactor and fuel cycle concepts, and evaluates proposed advanced nuclear fission energy concept and technical improvements for possible application to nuclear power plant systems. Because of the similarity of their missions, EM and NE interact where shared activities occur.
- The Office of Civilian Radioactive Waste Management (OCRWM) was established by the Nuclear Waste Policy Act of 1982 (42 USC 10224). The Office has responsibility for the Nuclear Waste Fund and for the management of Federal programs for recommending, constructing, and operating repositories for disposal of high-level radioactive waste and spent nuclear fuel; interim storage of spent nuclear fuel; monitored retrievable storage; and research, development and demonstration regarding disposal of high-level radioactive waste and spent nuclear fuel. EM and OCRWM work together to solve issues of mutual concern.

APPENDIX C

STRATEGIC PLAN
ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT

THE ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT MISSION

In support of the National Energy Strategy and the Department of Energy's other environmental goals, the mission of the DOE Environmental Restoration and Waste Management Program is to

- safely and acceptably prevent/minimize, handle, treat, store, transport, and dispose of DOE waste; and
- 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, acceptable levels.

This will be done using the most technically effective and cost-efficient means possible and providing appropriate opportunities for public involvement.

THE EM VISION OF THE FUTURE—YEAR 2019

Through sustained excellence in the performance of environmental restoration (remedial actions and decontamination and decommissioning), waste operations activities, and transportation of DOE waste—all supported by state-of-the-art, cost-effective, cradle-to-grave technological systems and paced by comprehensive land-use planning—DOE will earn the public's trust. Specifically:

- Not only EM activities but all DOE operations will be, and will be perceived to be, conducted in compliance with all applicable laws, treaties, regulations, and agreements. This will be accomplished by maximum recycling and reuse of materials and facilities, minimum generation of hazardous and radioactive waste, and minimum releases to the environment.
- The 1989 inventory of DOE surplus facilities and inactive sites will pose, and will be perceived to pose, no unacceptable risk to public health and safety and the environment.
- Remediation, decontamination and decommissioning, recycling, and conversion of sites and facilities added to the inventory after 1989 will be either completed or will be proceeding according to a well-defined and nationally accepted schedule.

SITUATION ANALYSIS

This section discusses the current situation facing the EM organization. Elements of EM's internal and external environments that effect EM's ability to achieve its mission objectives are reviewed. These include the current situation, planning assumptions, stakeholders and their principal interests and concerns, and key trends expected to affect the future of EM activities.

The Strategic Plan for Environmental Restoration and Waste Management is in the process of being revised as part of the FY 1995 planning cycle. Changes will include the addition of a "status" section for each objective and the modification of the objectives to reflect the challenges currently facing EM.

The Current Situation

- The magnitude, scope, and eventual total cost of accomplishing the EM mission is beginning to be recognized by DOE, Congress, and the public, but the full significance has yet to be grasped.
- A general lack of confidence in DOE's ability to manage the EM program continues to prevail among the program's stakeholders, particularly the public and the States. There is growing impatience with the rate of progress.
- DOE's lack of credibility with regulators and other stakeholders makes it difficult to use a risk-based system for setting program priorities.
- Management systems for estimating cost and schedule and for tracking performance are being developed and put in place but are not yet complete or integrated.
- Taken together, current agreements and regulations do not always realistically address critical technical and cost issues and their impacts.

Planning Assumptions

- EM will continue to operate in a resource-constrained environment. Given the size and scope of the EM mission, the demand for funding, personnel, and equipment may exceed what is available to meet program commitments.
- EM will ensure the health and safety of DOE employees, contractors, and the general public and will continue to work toward complying with all applicable environmental regulations, standards, and agreements.
- The reconfiguration of the weapons complex that will occur during the next decade, the EM Programmatic Environmental Impact Statement (PEIS), and the Defense Program PEIS for Complex-21 will contribute significantly to the evolution of the EM program.
- Over the long term, technically adequate, managerially sound, and publicly acceptable solutions to DOE's environmental problems will be developed.

Stakeholders

Key stakeholders and their principal interests and concerns include:

- **The Public:** There is a general lack of trust in both DOE's commitment to the EM program and its ability to manage it effectively. This attitude is increasingly combined with a concern that little progress is being made, despite significant expenditures.
- **Congress:** Although support for the EM program remains strong, there is growing concern about the program's pace and increasing costs. Members of both House and Senate continue to be actively interested in the economic and environmental impacts associated with DOE facilities and activities in their home districts and states, as well as the program in general.

- **States and Tribal Governments:** A principal concern is the degree of oversight and control they have over DOE activities. Particular focuses of concern include waste transportation; siting of waste treatment, storage, and disposal facilities; the establishment of cleanup priorities and milestones; and funding.

- **National Laboratories:** The national laboratories, with both enormous scientific and technical talent and the prospect of significantly reduced weapons development work, are actively pursuing the development of innovative and cost-effective waste management and remediation technologies.

- **DOE Contractors:** Faced with growing uncertainties about workloads and the potential for being held liable for environmental remediation, contractors expect DOE guidance and support to help them manage their programs and deal with regulators, other government entities, and the public.

- **DOE Employees:** DOE Field and Headquarters employees are proud of their accomplishments in the environmental arena. However, the rapid growth in size and scope of the EM program, concerns about perceived resource constraints, and continued lack of public confidence in DOE are adversely affecting morale.

- **Private Sector:** American industrial and service companies are significant contributors to the EM program. Their successful participation will depend on reasonable Federal procurement strategies, an equitable approach to the liability issue, and both programmatic and funding continuity.

- **Other Federal Agencies:** OMB, the Office of Technology Assessment, the Departments of Justice and Defense, the Army Corps of Engineers, and the Agency for Toxics Substances and Disease Registry (ATSDR) all play significant regulatory, budgetary, and program assessment roles. The Department of Defense is faced with environmental concerns that are in many ways similar to DOE's; it is reasonable to expect that each department can benefit from the other's knowledge and experience.

- **International Community:** Environment concerns are growing abroad. As this continues, opportunities will expand for international cooperative ventures in technology development and application, as well as other environmental initiatives.

Key Trends

- The regulatory climate continues to become both more complex and adversarial, with judicial actions becoming increasingly more common.
- Over the short term (the next two to five years), uncertainties continue to grow with respect to the magnitude, scope, and activity/responsibility mix of the EM program. This will have a significant impact on the emphasis of the Technology Development Program, particularly as a result of changes in the weapons complex.
- Program scope continues to grow, while at the same time Federal budgetary constraints on resources available to EM remain stringent.
- The quality and efficiency of the EM program continues to improve as a result of DOE Field Office and Headquarters employee and management dedication, innovation, and creative use of resources.
- The EM Technology Development Program continues to yield new and improved characterization, treatment, and handling technologies, leading to significant productivity enhancements and cost savings.

EM OBJECTIVES

This section discusses the major objectives that cut across the EM program. Key issues and obstacles, together with strategies for addressing them, are presented for each objective. Finally, in each case indicators designed to measure the future success of those strategies are shown.

OBJECTIVE: *CREDIBLE DECISION MAKING THROUGH SOUND PLANNING*

Improve the credibility and effectiveness of DOE decision making through an integrated, documented planning process that incorporates anticipated land use decisions and significant opportunities for public involvement.

Issues and Obstacles

- EM planning and budgeting processes are conducted under conditions of significant uncertainty regarding cleanup requirements and needs.
- Effective EM program planning and management will have to include external involvement by States, other Federal agencies, Tribal governments, and the public, which have differing policy agendas and generally do not have confidence in DOE.
- Reconciling land-use planning with the requirements of NEPA and CERCLA will require innovative environmental planning.

Strategies

- In cooperation with the public and other stakeholders, carefully define and put in place acceptable land-use planning methodologies. This will help establish, both within DOE and among stakeholders, a clear understanding of the meaning and scope of the 30-year cleanup and compliance goal and help provide a basis for integrated programmatic plans.

- Build EM's credibility with the public and other parties through active participation of independent, highly respected, external review groups and other innovative and proactive approaches of involving the public and thus building public confidence and understanding of the EM program.
- Avoid making commitments that are impossible to keep.

Success Indicators

- Development and implementation of a comprehensive, integrated approach to public involvement and outreach has increased levels of public confidence in the EM program, as, for example, shown by national and local surveys.
- Site-specific land-use planning efforts are supported by key local affected and interested parties, and timely approval of regulatory permits is the rule rather than the exception.

OBJECTIVE: ***FACILITIES TRANSFER, CONVERSION, AND DECOMMISSIONING***

Recycle, transfer, convert, decontaminate, and decommission facilities and sites to accommodate DOE's rapidly changing mission and priorities.

Issues and Obstacles

- Contraction and consolidation of the DOE weapons complex is leading to significant growth in the size and scope of EM Decontamination and Decommissioning (D&D) activities, which must be implemented in a manner consistent with the reuse, recycling, and resource conservation objectives of the National Energy Strategy.
- There are no D&D standards for "How clean is clean?"
- A strategy is lacking for fitting the growing D&D requirements into the EM program without "swamping" funding.
- Technologies to support D&D activities are lacking.
- D&D activities are susceptible to policy making and funding influences that complicate application of a total-systems, mission-oriented approach.

Strategies

- Help establish new DOE missions that would allow existing facilities and personnel (including the national laboratories and their staffs) to be used more effectively in support of the National Energy Strategy.
- Make D&D decisions on the basis of a sound, total-systems planning approach, applying present-value/life-cycle analyses to determine whether to keep facilities active in their present condition or close/replace them, pursuing maximum recycling of existing facilities, and requiring that expressed needs for new facilities be demonstrated and fully justified.
- Assess and demonstrate the advantages of recycling facilities in the context of the National Energy Strategy (e.g., lowering future energy costs and impacts).
- Demonstrate the linkages between the "How clean is clean?" issue and the effectiveness of recycling/reuse.
- Use public outreach programs to communicate DOE D&D policies and accomplishments.

Success Indicators

- There is a national consensus on the plan and schedule for the D&D of DOE facilities.
- A significant number of existing facilities have been, or are firmly scheduled to be, converted for reuse in a new mission.
- There is continuing improvement in on-time execution of D&D milestones.

OBJECTIVE: *ELIMINATE UNACCEPTABLE RISK*

Clean up all surplus facilities and inactive sites and treat, store, and dispose of hazardous, radioactive, and mixed waste so that unacceptable risk to the environment and public and worker health and safety is neither posed nor remains.

Issues and Obstacles

- Agreement has not been reached on the definition of "How clean is clean?"; similarly, there is no generally agreed upon definition of "acceptable risk."
- Current approaches to establishing risk are not based on adequate human health or environmental data.
- The public has no clear conception of how to evaluate "relative risks," making it difficult to develop Congressional and State, local, and Tribal government support for a risk-based prioritization approach.
- Standards are lacking for land utilization, and there is no consensus regarding the "end product" of cleanup activities.

Strategies

- Create a high-level independent external review body to oversee development of national "acceptable risk" definitions and standards, and establish an Executive/Legislative Branch, Federal-State-local coordinated national approach to development and implementation of the standards.
- Working with stakeholders, establish a risk-based methodology for prioritizing EM activities.
- Promote understanding of comparative risk through "risk tutorials" for key media representatives and other coordinated and science-based risk communication programs, including teacher-education and secondary-school outreach activities.
- Get more visible participation by the medical community in establishing definitions of acceptable risk.
- Establish a steering committee and process acceptable to stakeholders for each affected DOE site to oversee development of land-use planning and its effects on cleanup decisions.

Success Indicators

- General "acceptable risk" definitions and standards applicable to the EM program have been developed and are being implemented.
- Sound cleanup standards that are based on risk to the environment and to human health and safety have been established, and a risk-based EM prioritization methodology has been implemented.

- There is steady growth in the number of land-use/risk-based prioritization planning efforts across the DOE complex.
- Risk-communication programs are in place, yielding measurable improvements in the public's understanding of risk and risk-related issues and resulting in growth in public support for DOE cleanup activities.

OBJECTIVE: *REGULATORY COMPLIANCE*

Bring all DOE facilities and sites into, and operate them in, compliance with applicable laws, regulations, and agreements aimed at protecting public health, worker safety, and the environment.

Issues and Obstacles

- In large measure, present regulations are not based on human health and environmental risks.
- Regulatory developments are outstripping compliance capabilities. As a result, technologies and methods that could support compliance have not kept pace with regulatory requirements.
- Funding limitations may make it difficult, if not impossible, to fully satisfy all stakeholders at the many locations of DOE facilities.
- Differing perceptions of what constitutes acceptable risk complicate the compliance process.

Strategies

- Conduct program planning in a manner that anticipates and helps shape future regulatory requirements, develop mechanisms for appropriate DOE participation in the restructuring of environmental laws and regulations, and support development of national priorities and standards based on risk.
- Establish a compliance "report card" process that effectively informs the media and the general public about DOE's compliance activities and progress.

Success Indicators

- There is a significant reduction in "notices of violation," and approval times for permits and other regulatory requirements are shortened.
- As a result of effective risk communication programs, members of the State and Tribal Government Working Group (STGWG) and affected local publics are constructively involved in compliance-related activities.
- Evaluations and reports by EPA, the Defense Nuclear Facilities Safety Board, the Office of Nuclear Safety, the Office of Technology Assessment, the National Academy of Sciences, and Tiger Teams are steadily more positive.

OBJECTIVE: *POLLUTION PREVENTION*

Build pollution prevention, including waste minimization, recycling, and reuse of materials, into all EM activities.

Issues and Obstacles

- Pollution prevention and waste minimization activities must be carefully designed and integrated to support all relevant facets of the National Energy Strategy.
- Acceptable levels of contaminants in recycled materials have not been defined.
- Programs or incentives to promote recycling across the DOE complex are limited and lack coordination.
- A consensus on pollution prevention goals has not yet been reached within DOE, and EM is in the early stages of developing coordinated, DOE-wide waste minimization and pollution prevention programs in cooperation with other Program Secretarial Officer (PSO) organizations.

Strategies

- Use a total system (life cycle) cost approach to assess and demonstrate cost-effectiveness of prevention, with projected costs and benefits expressed in present-value terms.
- In cooperation with other PSOs, use the crosscut planning process under SEN-25A to develop and establish an aggressive program to facilitate the development and effective adoption of pollution prevention and waste minimization methods and technologies throughout the complex. This would include an incentive program to reward effective pollution prevention/waste minimization practices and programs.
- Establish cooperative relationships with the NRC and the EPA to promote pollution prevention goals and develop consensus on accepted definitions and environmental cleanup standards.

Success Indicators

- A DOE pollution prevention crosscut plan and an ongoing waste minimization program are in place, resulting in a quantifiable reduction in the ratio between waste streams and production activities, a progressive increase in the proportion of waste-stream materials that are recycled, and strong public, industry, and international perceptions of DOE as a leader in pollution prevention and waste minimization.

OBJECTIVE: *INFRASTRUCTURE*

Ensure sufficient infrastructure to complete EM's mission by effectively estimating, developing, and providing the program's human-resource and capital-asset requirements.

Issues and Obstacles

- There is limited time to plan effectively for EM resource needs because of the press of day-to-day business.
- Organizational dynamics often make it difficult to reallocate personnel to respond to DOE's changing mission.
- Difficulty in recruiting qualified personnel continues.

- The high ratio of contractor to Federal staff resources complicates program oversight.

Strategies

- Institute credible resource-needs-assessment approaches and establish a prioritization process for funding and personnel requirements that is tied to specific program milestones. Using the results, establish a clear understanding of projected resource requirements DOE-wide.
- Develop broad-spectrum public outreach and education programs at all levels to support EM's long-term human resource requirements and foster development of an effective EM staff recruitment network.
- Establish an EM research and analysis institute similar to the Institute for Defense Analyses.

Success Indicators

- There is improved program oversight as a result of growth in qualified Federal staff.
- Reallocation of personnel is consistent with program needs, and success in meeting recruitment goals is steadily increasing.

OBJECTIVE: *EFFICIENT USE OF RESOURCES*

Aggressively pursue innovative approaches to development, acquisition, and management of resources.

Issues and Obstacles

- Although improvements are being made continually, insufficiently developed program management capabilities inhibit program effectiveness.
- Obstacles to timely reallocation of resources have adversely affected program operations.
- Contribution of RDDT&E to program efficiencies is limited by the fact that funds are discretionary in nature.

Strategies

- Develop better understanding on the part of both DOE Field and Headquarters upper management and OMB of the need to develop additional and improved management capabilities and systems.
- Establish a program that continually reevaluates resource allocations in terms of Mission requirements, accelerates implementation of validated work breakdown structure systems, and puts in place and acts upon project management and control documents.
- Improve planning and analysis at the corporate level to better ensure corporate-level decisions are made a part of programmatic and field planning.
- Prioritize needs before starting projects and ensure that major projects are not started until overall concepts and supporting technologies are validated.
- Establish programs to promote "team-building" within and among EM Headquarters and Field organizations.
- Pursue industrial cost sharing for technology development.

Success Indicators

- Management improvements have resulted in demonstrable cost savings and control of cost overruns.
- Productive public-private partnerships in technology development are under way.
- Reduction in the number of media reports that center on DOE mismanagement and a concomitant increase in positive media reports on DOE management improvements have resulted in enhanced public recognition of the effectiveness of EM Program management.
- OMB confidence in EM Activity Data Sheets and basic cost validation methods is firmly established.

APPENDIX D

Sites/Facilities Where Environmental Restoration and Waste Management Activities Are Being Conducted

Office	Installation	Location
ALBUQUERQUE	Grand Junction Projects Office	Grand Junction, Colorado
	Inhalation Toxicology Research Institute	Albuquerque, New Mexico
	Kansas City Plant	Kansas City, Missouri
	Kauai Test Facility	Kauai, Hawaii
	Los Alamos National Laboratory	Los Alamos, New Mexico
	Mound Plant	Miamisburg, Ohio
	Pantex Plant	Amarillo, Texas
	Pinellas Plant	Largo, Florida
	Sandia National Laboratories–Albuquerque	Albuquerque, New Mexico
	Sandia National Laboratories–Livermore	Livermore, California
	Sandia National Laboratories–Tonopah	Tonopah, Nevada
	South Valley Site	Albuquerque, New Mexico
	Waste Isolation Pilot Plant	Carlsbad, New Mexico
CHICAGO	Ames Laboratory	Ames, Iowa
	Argonne National Laboratory–East	Chicago, Illinois
	Argonne National Laboratory–West	Idaho Falls, Idaho
	Battelle Columbus Laboratories Decommissioning Project	Columbus, Ohio
	Brookhaven National Laboratory	Upton, New York
	Fermi National Accelerator Laboratory	Batavia, Illinois
	Hallam Nuclear Power Facility	Lincoln, Nebraska
	Piqua Nuclear Power Facility	Piqua, Ohio
	Princeton Plasma Physics Laboratory	Princeton, New Jersey
	Site A/Plot M	Cook County, Illinois
FERNALD	Fernald Environmental Management Project	Fernald, Ohio
IDAHO	Component Development & Integration Facility	Butte, Montana
	Idaho Chemical Processing Plant	Idaho Falls, Idaho
	Idaho National Engineering Laboratory	Idaho Falls, Idaho
	West Valley Demonstration Project	West Valley, New York
NEVADA	Nevada Test Site	South Central Nevada
	Nevada Off-Site Locations:	
	• Amchitka Island	Amchitka Island, Alaska
	• Central Nevada Test Site	Central Nevada
	• Gasbuggy Site	Farmington, New Mexico
	• Gnome-Coach Site	Carlsbad, New Mexico
	• Rio Blanco Site	Rifle, Colorado
	• Rulison Site	Rifle, Colorado
	• Shoal Site	Fallon, Nevada
	• Tatum Dome Test Site	Hattiesburg, Mississippi
	Tonopah Test Range	Nellis Air Force Base, Nevada

Office	Installation	Location
OAK RIDGE	Oak Ridge K-25 Site	Oak Ridge, Tennessee
	Oak Ridge National Laboratory	Oak Ridge, Tennessee
	Oak Ridge Y-12 Plant	Oak Ridge, Tennessee
	Paducah Gaseous Diffusion Plant	Paducah, Kentucky
	Portsmouth Gaseous Diffusion Plant	Portsmouth, Ohio
	Weldon Spring Site Remedial Action Project	St. Louis, Missouri
	Center for Energy and Environmental Research	Puerto Rico
RICHLAND	Hanford Reservation	Richland, Washington
ROCKY FLATS	Rocky Flats Plant	Golden, Colorado
SAN FRANCISCO	General Atomics	La Jolla, California
	General Electric Vallecitos Nuclear Center	Pleasanton, California
	Laboratory for Energy-Related Health Research	Davis, California
	Lawrence Berkeley Laboratory	Berkeley, California
	Lawrence Livermore National Laboratory	Livermore, California
	Energy Technology Engineering Center	Canoga Park, California
	Stanford Linear Accelerator Center	Palo Alto, California
SAVANNAH RIVER	Savannah River Site	Aiken, South Carolina

Formerly Utilized Sites Remedial Action Program (FUSRAP) Sites

	University of California*	Berkeley, California
	National Guard Armory*	Chicago, Illinois
	University of Chicago*	Chicago, Illinois
	W. R. Grace & Co.	Curtis Bay, Maryland
	General Motors	Adrian, Michigan
	Latty Avenue Properties	Hazelwood, Missouri
	St. Louis Airport Site	St. Louis, Missouri
	St. Louis Airport Storage Site Vicinity Properties	St. Louis, Missouri
	St. Louis Downtown Site	St. Louis, Missouri
	Acid/Pueblo Canyon*	Los Alamos, New Mexico
	Bayo Canyon*	Los Alamos, New Mexico
	Chupadera Mesa*	White Sands, New Mexico
	Niagara Falls Storage Site*	Lewiston, New York
	Ashland 1/Ashland 2	Tonawanda, New York
	Linde Air Products	Tonawanda, New York
	Seaway	Tonawanda, New York
	Albany Research Center*	Albany, Oregon
	Aliquippa Forge	Aliquippa, Pennsylvania

	Installation	Location
FUSRAP Sites		
	Middlesex Municipal Landfill*	Middlesex, New Jersey
	Middlesex Sampling Plant	Middlesex, New Jersey
	Baker & Williams Warehouses	New York, New York
	Elza Gate*	Oak Ridge, Tennessee
	New Brunswick Laboratory	New Brunswick, New Jersey
	Du Pont & Company	Deepwater, New Jersey
	Maywood	Maywood, New Jersey
	Kellex/Pierpont*	Jersey City, New Jersey
	Wayne/Pequannock	Wayne, New Jersey
	Colonie	Colonie, New York
	Seymour Specialty Wire	Seymour, Connecticut
	Shpack Landfill	Norton, Massachusetts
	Ventron	Beverly, Massachusetts
Uranium Mill Tailings Remedial Action Sites		
	Monument Valley, Arizona	Belfield, North Dakota
	Tuba City, Arizona	Bowman, North Dakota
	Durango, Colorado	Lakeview, Oregon
	Grand Junction, Colorado	Canonsburg, Pennsylvania
	Gunnison, Colorado	Edgemont, South Dakota
	Maybell, Colorado	Falls City, Texas
	Naturita, Colorado	Green River, Utah
	Rifle, Colorado	Mexican Hat, Utah
	Slick Rock, Colorado	Salt Lake City, Utah
	Lowman, Idaho	Riverton, Wyoming
	Ambrosia Lake, New Mexico	Spook, Wyoming
	Shiprock, New Mexico	

*Remedial Actions Accomplished

APPENDIX E

DOE PUBLIC READING ROOMS

California
US DOE - San Francisco
1333 Broadway, Wells Fargo Building
Oakland, CA 94612
(510) 273-4428

Colorado
US DOE - Grand Junction Area Office
2597 B-3/4
P.O. Box 2567
Grand Junction, CO 81503
(303) 248-6015

US DOE - Rocky Flats
Front Range Community College
3645 W. 112 Avenue
Westminster, CO 80030
(303) 469-4435

District of Columbia
US DOE - Headquarters
Room 1E-190
1000 Independence Avenue, SW
Washington, DC 20585
(202) 586-6020

Georgia
US DOE - Southeastern Power Administration
Samuel Elbert Building, Public Square
Elberton, GA 30535
(404) 283-9911

Idaho
INEL Technical Library Center
1776 Science Center Drive
P.O. Box 1625
Idaho Falls, ID 83415-1144
(208) 526-1144

Illinois
US DOE - Chicago
9800 S. Cass Avenue
Argonne, IL 60439
(312) 972-2010

Massachusetts
US DOE - Chicago
Boston Support Office
10 Causeway Street, Room 1197
Boston, MA 02222-1035
(617) 585-7703

Nevada
US DOE - Nevada
2753 S. Highland Drive
P.O. Box 98518
Las Vegas, NV 89193-8518
(702) 295-1128

New Mexico
US DOE - Albuquerque
National Atomic Museum
Building 20358 Wyoming Blvd.
P.O. Box 5400
Albuquerque, NM 87165-5400
(505) 845-4378

Ohio
Fernald Environmental Management Project
Public Environmental Information Center
Jamtek Building
10845 Hamilton Cleves Highway
Harrison, OH 45030
(513) 738-0164

Oklahoma
US DOE - NIPER Library
220 N. Virginia Avenue
P.O. Box 2128
Bartlesville, OK 74003
(918) 337-4372

Pennsylvania
US DOE - Philadelphia Support Office
1421 Cherry Street, 10th floor
Philadelphia, PA 19102
(212) 597-7898

Cochran Mill Road, Building 95
P.O. Box 10940
Pittsburgh, PA 15236-0940
(412) 892-4751

South Carolina
Savannah River Field Office
P.O. Box A
Aiken, SC 29802
(803) 725-2889

Tennessee
US DOE - Oak Ridge
200 Administration Road
P.O. Box 2001
Oak Ridge, TN 37831-8510
(615) 576-1218

Texas
US DOE - Amarillo
2201 S. Washington Street
P.O. Box 30030
Amarillo, TX 79120
(806) 371-5400

US DOE - Dallas Support Office
1440 W. Mockingbird Lane, Suite 305
Dallas, TX 75247
(214) 767-7040

Washington
US DOE - Richland
825 Jadwin Avenue
P.O. Box 1970 A1-65
Richland, WA 99352
(509) 376-8583

West Virginia
US DOE - Morgantown Energy Technology
Center Library
3610 Collins Ferry Road
P.O. Box 880
Morgantown, WV 26507
(304) 291-4183

APPENDIX F

Compliance Agreements, Consent Decrees and Agreements-In-Principle

The following is (1) a listing of compliance agreements (also referred to as Federal Facility Agreements and Consent Orders) by DOE facility showing the parties to each agreement, the governing statute, and the date executed; and (2) a listing of States showing the status of Agreements-in-Principle between States and the DOE facilities in each State.

FACILITY COMPLIANCE AGREEMENTS, FEDERAL FACILITY AGREEMENTS, SETTLEMENT AGREEMENTS, AND CONSENT ORDERS

FACILITY	PARTIES	STATUTE(S)	DATE EXECUTED
Albuquerque Field Office			
Grand Junction Projects Office (Monticello Mill Site)	DOE/EPA/Utah	CERCLA	12/22/88
Kansas City Plant	DOE/EPA	CERCLA	09/30/85
	DOE/EPA	RCRA	06/23/89
Los Alamos National Laboratory	DOE/EPA	CWA	02/13/89
Mound Plant	DOE/EPA	CERCLA	08/06/90
Pantex Plant	DOE/EPA	RCRA	12/10/90
Sandia National Laboratory-Albuquerque	DOE/New Mexico	RCRA	12/29/89
Chicago Field Office			
Brookhaven National Laboratory	DOE/EPA	TSCA	09/04/87
	DOE/EPA/New York	CERCLA	05/27/92
Fernald Field Office			
Fernald Environmental Management Project (Formerly known as Feed Materials Production Center)	DOE/EPA	CERCLA/ RCRA/CAA	07/19/86
	DOE/Ohio	RCRA/CWA	12/02/88
	Westinghouse/ Ohio	CAA	12/02/88
	DOE/EPA	CERCLA	06/29/90; Amended 09/14/91
	DOE/EPA	CAA (NESHAP)	11/14/91
Idaho Field Office			
Idaho National Engineering Laboratory	DOE/EPA	RCRA	07/10/87
	DOE/EPA/Idaho	CERCLA	12/09/91
	DOE/Idaho	CAA	02/11/92
	DOE/Idaho	RCRA	04/03/92
	DOE/Idaho	RCRA	10/06/92
	DOE/Idaho	CWA	10/06/92
West Valley Demonstration Project	DOE/EPA/New York	RCRA	03/05/92

FACILITY COMPLIANCE AGREEMENTS, FEDERAL FACILITY AGREEMENTS, SETTLEMENT AGREEMENTS, AND CONSENT ORDERS

FACILITY	PARTIES	STATUTE(S)	DATE EXECUTED
Nevada Field Office			
Nevada Test Site	DOE/Nevada	RCRA-Mixed TRU Waste Storage	06/23/92
Oak Ridge Field Office			
Formerly Utilized Sites Remedial Action Program			
(St. Louis Airport Site)	DOE/EPA	CERCLA	06/26/90
(Maywood, New Jersey Site)	DOE/EPA	CERCLA	09/17/91
(Wayne, New Jersey Site)	DOE/EPA	CERCLA	09/17/91
Oak Ridge Reservation	DOE/EPA/ Tennessee	CERCLA	01/01/92
Oak Ridge National Laboratory	DOE/EPA	CAA (NESHAP)	05/26/92
	DOE/EPA	RCRA LDR	06/12/92
Oak Ridge National Laboratory	DOE/EPA	CWA	02/12/86
Y-12 Plant	DOE/EPA	CAA	04/14/82
	DOE/EPA	CWA	04/17/82
Paducah Gaseous Diffusion Plant	DOE/Kentucky	CWA	09/28/87
	DOE/EPA	CERCLA	11/04/88
	DOE/EPA	TSCA	02/20/92
	DOE/EPA	RCRA	03/26/92
	DOE/EPA	CAA (NESHAP)	05/27/92
	DOE/EPA	RCRA LDR	06/30/92
Portsmouth Gaseous Diffusion Plant	DOE/EPA	RCRA	09/30/86
	DOE/Ohio	RCRA	08/31/89
	DOE/EPA	RCRA/CERCLA	09/27/89
	DOE/EPA	TSCA	02/20/92
Weldon Spring Site, Remedial Action Project	DOE/EPA	CERCLA/NEPA	08/22/86; Amended 01/28/92; Effective 06/30/92
Richland Field Office			
Hanford Site	DOE/Washington	RCRA	10/01/86
	DOE/EPA/ Washington	CERCLA/RCRA	05/15/89; Amended 05/15/91
	DOE/EPA	TSCA	03/27/90

FACILITY COMPLIANCE AGREEMENTS, FEDERAL FACILITY AGREEMENTS, SETTLEMENT AGREEMENTS, AND CONSENT ORDERS

FACILITY	PARTIES	STATUTE(S)	DATE EXECUTED
Hanford Site (continued)	DOE/Washington	Waste Discharge Permit Program	12/23/91
Rocky Flats Office			
Rocky Flats Plant	DOE/EPA/Colorado	CERCLA/RCRA	07/31/86
	DOE/Colorado	RCRA	07/14/89
	DOE/EPA/Colorado	RCRA	09/19/89
	DOE/Colorado	RCRA	11/03/89
	DOE/EPA/Colorado	CERCLA	01/22/91
	DOE/EPA	RCRA	05/10/91
Savannah Field Office			
Lawrence Livermore National Laboratory Site 300	DOE/EPA/California	TSCA	03/19/87
	DOE/California	California State Hazardous Waste Law	09/25/87
	DOE/EPA/California	CERCLA	11/01/88
Site 300	DOE/EPA/California	CERCLA	06/29/92
Savannah Field Office			
Savannah River Site	DOE/South Carolina	CAA	02/27/79
	DOE/South Carolina	CWA	01/03/84; Amended 08/31/87
	DOE/South Carolina	SDWA	11/28/84
	DOE/South Carolina	SDWA	06/10/85
	DOE/South Carolina	RCRA	07/19/85
	DOE/South Carolina	RCRA	11/07/85
	DOE/South Carolina	CWA	06/20/86
	DOE/South Carolina	RCRA	10/06/86
	DOE/South Carolina	CWA	10/06/86
	DOE/South Carolina	CWA	10/24/86
	DOE/EPA	CAA	01/23/87
	DOE/South Carolina	RCRA	05/01/87
	DOE/EPA	RCRA	07/30/87
	DOE/South Carolina	CAA	09/04/87
	DOE/South Carolina	SDWA	09/09/87
	DOE/South Carolina	SDWA	09/11/87
	DOE/South Carolina	SDWA	10/07/87
	DOE/South Carolina	RCRA	11/12/87
	DOE/South Carolina	RCRA	11/12/87

FACILITY COMPLIANCE AGREEMENTS, FEDERAL FACILITY AGREEMENTS, SETTLEMENT AGREEMENTS, AND CONSENT ORDERS

FACILITY	PARTIES	STATUTE(S)	DATE EXECUTED
Savannah River Site (continued)	DOE/South Carolina	RCRA	12/29/87
	DOE/South Carolina/ NRDC	RCRA	05/26/88
	DOE/South Carolina	RCRA	11/23/88
	DOE/South Carolina	RCRA	02/12/89
	DOE/South Carolina	RCRA	12/16/89
	DOE/South Carolina	CWA	02/27/90
	DOE/South Carolina	CWA	06/05/90
	DOE/South Carolina	CWA	06/05/90
	DOE/South Carolina	CWA	09/05/90
	DOE/South Carolina	RCRA	09/05/90
	DOE/EPA	RCRA	03/13/91
	DOE/South Carolina	CWA	07/31/91
	DOE/South Carolina	RCRA	08/26/91
	DOE/EPA	CAA (NESHAP)	10/31/91
	DOE/South Carolina	RCRA	04/23/92
Other DOE Sites			
Bonneville (Ross Complex)	DOE/EPA/ Washington	CERCLA	05/01/90
Great Plains Gasification Plant	DOE/EPA/ North Dakota	CAA	03/25/88
Naval Petroleum Reserves, California	DOE/EPA	CAA	02/04/88
Western Area Power Administration	DOE/EPA	RCRA	12/30/87

NOTE: Some sites have multiple compliance agreements as required by several relevant regulatory drivers (e.g., CAA, CWA, TSCA, NESHAPs). Some earlier agreements have been incorporated into more recent agreements.

STATUS OF AGREEMENTS-IN-PRINCIPLE WITH STATES*

State	Facilities Covered Under Agreement	Status of Negotiations	Completion Date**
CA	Lawrence Livermore National Laboratory Lawrence Berkeley Laboratory Stanford Linear Accelerator Center Energy Technology Engineering Center Lab. for Energy-Related Health Research Sandia National Laboratory-Livermore	Completed	09/06/90
CO	Rocky Flats Plant	Completed	06/28/89
FL	Pinellas Plant	Completed	09/20/90
GA	Savannnah River Site	Under negotiation	Late 1992
IL	Argonne National Laboratory Fermi National Accelerator Laboratory Palos Forest Preserve Site	Under negotiation	1993
ID	Idaho National Engineering Laboratory	Completed	05/21/90
KY	Paducah Gaseous Diffusion Plant	Completed	05/13/91
MO	Kansas City Plant	Under negotiation	Spring 1993
MS	Tatum Dome	Completed	01/28/91
NM	Sandia National Laboratory Los Alamos National Laboratory Waste Isolation Pilot Plant Inhalation Toxicology Research Institute	Completed	10/22/90
NV	Nevada Test Site Tonopah Test Range	Completed	10/04/90
OH	Fernald Environmental Management Project Portsmouth Gaseous Diffusion Plant Mound Plant	Under negotiation	Early 1993

STATUS OF AGREEMENTS-IN-PRINCIPLE WITH STATES*

State	Facilities Covered Under Agreement	Status of Negotiations	Completion Date**
SC	Savannah River Site	First phase of agreement completed; focuses on emergency planning and training for State/local response to on-site incidents; Second phase of negotiations started.	03/05/92; Phase 2 completion expected early 1993
TN	Oak Ridge Reservation	Completed	05/13/91
TX	Pantex	Completed	07/31/90
WA	Hanford Site	Oversight and monitoring covered under Tri-Party Agreement with State and EPA; separate AIP has not been developed.	N/A

* The Agreements-in-Principle have 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 on-site emergencies. Status is as of 12/22/92.

** A total of 11 Agreements-in-Principle have been finalized to date.

APPENDIX G

Estimates by Activity Data Sheet

Activity Data Sheets (ADSs) are the central planning unit for EM. The ADSs cover all EM-funded installation and Headquarters activities during each five-year planning period. The ADSs include such items as cost estimates and priority levels, regulatory drivers, milestones, and a narrative description of activities.

The Field Offices prepare ADSs for submission to Headquarters. Headquarters conducts reviews of ADS submittals to validate costs, determine consistency with programmatic goals, and ensure that regulators, including the State and Tribal Government Working Group, have the opportunity to review the ADSs before they are finalized.

ADSs have been consolidated from approximately 2020 in the FY 1993–1997 Five-Year Plan to 850 in support of the FY 1994–1998 Five-Year Plan. This consolidation was done to align ADSs with programmatic work breakdown structures and other program elements. This consolidation will allow the ADSs to be more effectively used as project management tools.

Waste Management

ADSs for the Waste Management Program are based on the Work Breakdown Structure (WBS) approved on May 1, 1992. Each Field Office has five major areas of work-related functions that are used to organize their ADSs:

- Facility Operations and Maintenance,
- New Facility Planning,
- General Plant Projects (Waste Management),
- Corrective Activities, and
- General Plant Projects (Corrective Activities)

In addition to these categories, each Field Office may prepare additional ADSs that are specific to their own facility. The new WBS has consolidated the ADSs from last year and condensed them into more general categories to better correspond with the structure of the waste management programs.

Environmental Restoration

Beginning this year, the Environmental Restoration Program is organized into 17 large projects (Major System Acquisition and Major Projects). These projects are defined and described in a WBS that organizes all the elements of the program into a framework that subdivides activities into lower elements that are characterized by increasingly detailed packages of work. The work associated with each element will be accomplished by developing and maintaining technical (scope), schedule, and cost baselines.

ADSs prepared this year describe the scope, schedule, and costs associated with the subproject level in the WBS.

The development and implementation of the environmental restoration WBS is a blend of the old and the new. The new organization was created in a logical manner that recognizes both historical and new management philosophies. While the basic scopes, schedules and costs have not significantly changed since the ADSs were prepared last year, some of the overall groupings of activities have changed as a result of the new organization. In addition, last year, separate ADSs were prepared for the assessment and cleanup portions of each activity. This year these two phases are combined into a single ADS. Therefore, care must be taken when comparing the ADSs from last year to those that have been prepared this year.

Technology Development

For the FY 1994–1998 Five-Year Plan, Technology Development Program activities have identified ten Technology Activity Data Sheets (TADSs). These TADS represent technology development efforts across the complex that correspond closely with waste management and environmental restoration needs, mission directives, and management requirements. For example, the TADS for groundwater and soil cleanup can be seen to directly support environmental restoration activities, while the Waste Retrieval and Processing TADS support waste management activities.

The Waste Minimization and Avoidance TADS respond to a Congressional mandate articulated in the National Defense Authorization Act, as does the Technology Integration and Environmental Education and Development TADS. RDDT&E Innovation Supporting Technologies and Infrastructure, and the Environmental Molecular Science Laboratory TADSs, provide crosscutting support to the entire Environmental Restoration and Waste Management Program. The Transportation Management TADS support DOE-wide transportation logistics, packages, and training needs. The Program Direction and Program Support TADS provide the essential management for all Technology Development Program efforts.

Activity Data Sheet
Sorted by Field Office, Installation, and Category
(dollars in thousands)

ADS Number	Title	FY92	FY93
FIELD OFFICE: AL, INSTALLATION: ALBUQUERQUE OPERATIONS, CATEGORY: ER			
ALAL- 16- -	ER Agreement in Principle, State of TX, State of FL & State of MO	0	1,127
ALAL- 17- -	ER Program Support	3,896	6,587
ALAL- 18- -	ER Program Support	2,956	2,807
ALAL-1001- -	South Valley Superfund Site Rem (AL-SV-1)	2,062	872
	Subtotal: AL, ALBUQUERQUE OPERATIONS, ER	8,914	11,393
FIELD OFFICE: AL, INSTALLATION: ALBUQUERQUE OPERATIONS, CATEGORY: WM			
AL -3031-1 -	Waste Management Program Direction	6,004	4,284
ALAL- 2- -	Program Control	1,666	1,700
ALAL- 14- -	Agreements-in-Principle, State of NM, State of FL, State of TX	4,747	3,125
	Subtotal: AL, ALBUQUERQUE OPERATIONS, WM	12,417	9,109
	Subtotal: AL, ALBUQUERQUE OPERATIONS	21,331	20,502
FIELD OFFICE: AL, INSTALLATION: GRAND JUNCTIONS PROJECT OFFICE, CATEGORY: ER			
AL - 320- -	Monticello Surveys/IVC Support	63	226
AL - 381- -	GJPORAP Independent Verification	158	500
AL -1001-GJ-	Monticello Remedial Action Project/State of Utah Grant	10,745	20,386
AL -1002-GJ-	Monticello Surface and Groundwater Remediation	663	304
AL -1003-GJ-	Monticello Vicinity Properties Project	3,692	4,000
AL -1004-GJ-	Long Term Surveillance and Maintenance Program (LTSM)	0	0
AL -1005-GJ-	Grand Junction Projects Office Remedial Action Project (GJPORAP)	5,901	300
AL -1006-GJ-	Grand Junction Projects Office Landlord Support	0	0
AL -1007-GJ-	Environmental Management Technical Center (EMTC)	1,079	300
	Subtotal: AL, GRAND JUNCTIONS PROJECT OFFICE, ER	22,301	26,016
	Subtotal: AL, GRAND JUNCTIONS PROJECT OFFICE	22,301	26,016
FIELD OFFICE: AL, INSTALLATION: INHALATION TOXICOLOGY RESEARCH INS, CATEGORY: CA			
ALIT- 13- -	GPP Corrective Activities	103	0
	Subtotal: AL, INHALATION TOXICOLOGY RESEARCH INS, CA	103	0
FIELD OFFICE: AL, INSTALLATION: INHALATION TOXICOLOGY RESEARCH INS, CATEGORY: ER			
ALIT-1013- -	Diesel Oil Assessment and Remediation (ALIT-1013)	276	737
ALIT-1015- -	Hot Pond Assessment and Remediation (ALIT-1015)	222	497
ALIT-1019- -	Groundwater and Sanitary Lagoons Assess. and Remed. (ALIT-1019)	704	627
ALIT-1023- -	Environmental Assessment and Remediation Program Mgmt (ALIT-1023)	1,661	872
	Subtotal: AL, INHALATION TOXICOLOGY RESEARCH INS, ER	2,863	2,733

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FY 1993: These data reflect the FY1993 appropriations by program; the allocations by ADS may be revised as the year progresses.

Activity Data Sheet
Sorted by Field Office, Installation, and Category
(dollars in thousands)

ADS Number	Title	FY92	FY93
FIELD OFFICE: AL, INSTALLATION: INHALATION TOXICOLOGY RESEARCH INS, CATEGORY: WM			
ALAL- 51- -	Waste Minimization Planning (Non-Defense)	18	19
ALIT-3045- -	Facility Operations and Maintenance	507	430
ALIT-3265- -	GPP Waste Management	468	0
	Subtotal: AL, INHALATION TOXICOLOGY RESEARCH INS, WM	993	449
	Subtotal: AL, INHALATION TOXICOLOGY RESEARCH INS	3,959	3,182
FIELD OFFICE: AL, INSTALLATION: KANSAS CITY PLANT, CATEGORY: CA			
ALKC-1723- -	KCP Corrective Activities	4,140	2,791
	Subtotal: AL, KANSAS CITY PLANT, CA	4,140	2,791
FIELD OFFICE: AL, INSTALLATION: KANSAS CITY PLANT, CATEGORY: ER			
ALKC-1022- -	Environmental Restoration Management	695	687
ALKC-1024- -	Abandoned Indian Creek Outfall (AICO) Remediation	8,968	2,893
ALKC-1028- -	Department 26	631	108
ALKC-1029- -	Department 27 Inside	0	102
ALKC-1030- -	Department 27 Interim Measures	312	46
ALKC-1032- -	Miscellaneous Contaminated Sites	904	100
ALKC-1034- -	Miscellaneous PCB Sites	0	13
ALKC-1036- -	NEPA Environmental Assessment	259	712
ALKC-1038- -	Outfall 001 Raceway & Retention Pond	147	143
ALKC-1040- -	Plating Building	498	85
ALKC-1042- -	RCRA South Lagoon Closure Groundwater	108	52
ALKC-1044- -	Groundwater Treatment & Monitoring	330	1,733
ALKC-1046- -	TCE Still Area Soils	1,627	196
ALKC-1048- -	Department 71 & Truck Shop Sump	0	201
ALKC-1050- -	Northeast Area	388	699
	Subtotal: AL, KANSAS CITY PLANT, ER	14,867	7,770
FIELD OFFICE: AL, INSTALLATION: KANSAS CITY PLANT, CATEGORY: WM			
ALKC-3000- -	Facility Operations and Maintenance	7,085	6,792
ALKC-3001- -	General Plant Projects Waste Management	241	0
ALKC-3238- -	Waste Minimization Planning	251	268
	Subtotal: AL, KANSAS CITY PLANT, WM	7,577	7,060
	Subtotal: AL, KANSAS CITY PLANT	26,584	17,621
FIELD OFFICE: AL, INSTALLATION: LOS ALAMOS NATIONAL LABORATORY, CATEGORY: CA			
ALLA- 42- -	ES&H Improvements (Haz. Waste Treat. Fac.)	0	6,315

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Activity Data Sheet
Sorted by Field Office, Installation, and Category
(dollars in thousands)

ADS Number	Title	FY92	FY93
ALLA- 51- -	Sanitary Wastewater Systems Consolidation	1,546	0
ALLA- 74- -	Air Exhaust Mods.	3,505	0
ALLA- 81- -	Corrective Activities	6,199	2,865
ALLA- 82- -	GPP Corrective Activities	2,200	1,200
	Subtotal: AL, LOS ALAMOS NATIONAL LABORATORY, CA	13,450	10,380

FIELD OFFICE: AL, INSTALLATION: LOS ALAMOS NATIONAL LABORATORY, CATEGORY: ER

ALLA-1049- -	Canyons	100	860
ALLA-1051- -	Program Management - Defense Program (DP) Projects	1,030	1,416
ALLA-1051-B -	Program Management - Non-Defense Programs (NON-DP) Projects	0	410
ALLA-1054- -	Phase Separator Pit Decommissioning	0	1,833
ALLA-1055- -	Decontamination and Decommissioning of TA-21, DP West Site	1,344	1,692
ALLA-1062- -	Interim Remedial Measures	697	0
ALLA-1063- -	Interim Remedial Measures	0	0
ALLA-1066- -	NEPA Documentation for Disposal Facility	96	500
ALLA-1067- -	RCRA Mixed Waste Storage/Disposal Facility	463	2,670
ALLA-1071- -	TA-0, 19, 26, 73, 74	769	2,789
ALLA-1078- -	TA-1	790	3,218
ALLA-1079- -	TA-10,31,32,45	869	1,560
ALLA-1082- -	TA-11,13,16,24,25,28,37	1,500	2,018
ALLA-1085- -	TA-12,14,67	0	483
ALLA-1086- -	TA-15	900	1,443
ALLA-1093- -	TA-18, 27, 65	850	475
ALLA-1098- -	TA-2, 41	800	636
ALLA-1100- -	TA-20, 53, 72	0	1,076
ALLA-1106- -	TA-21	4,051	4,016
ALLA-1111- -	TA-6,7,22,40,58,62	1,150	1,560
ALLA-1114- -	TA-3,59,60, 61, 64	1,300	881
ALLA-1122- -	TA-33	492	2,429
ALLA-1127- -	TA-35 Waste Oil Storage Pit Etc.	21	0
ALLA-1129- -	TA-4,5,35,42,48,52,55,63,66	800	3,155
ALLA-1130- -	TA-36,68,71	550	853
ALLA-1132- -	TA-39	551	877
ALLA-1135- -	TA-40 Scrap Detona. Site Closure	644	167
ALLA-1136- -	TA-43	0	100
ALLA-1140- -	TA-46 Assessment	650	819
ALLA-1144- -	TA-49	600	998
ALLA-1147- -	TA-50	600	1,201
ALLA-1148- -	TA-51, 54	1,319	3,585
ALLA-1154- -	TA-57	0	219
ALLA-1157- -	TA-8,-9,-23,-69	894	705
ALLA-2105- -	Programmatic Tech Support	10,683	14,759
ALLA-2107- -	Programmatic Management	8,685	10,635
ALLA-2110- -	Environmental Restoration Analytical Chemistry Facility	300	0
ALLA-2134- -	Decommissioning of TA-3, SM-35, Press Building	0	0
ALLA-2135- -	Decontamination TA-33, Building 86, Tritium Facility	0	0
ALLA-2136- -	Decommissioning of HE Contaminated Buildings at TA-16	0	0
ALLA-2137- -	Technical Support for D&D	0	0

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Activity Data Sheet
Sorted by Field Office, Installation, and Category
(dollars in thousands)

ADS Number	Title	FY92	FY93
ALLA-2138- -	Surveillance & Maintenance of DP Facilities	0	0
	Subtotal: AL, LOS ALAMOS NATIONAL LABORATORY, ER	43,498	70,038
FIELD OFFICE: AL, INSTALLATION: LOS ALAMOS NATIONAL LABORATORY, CATEGORY: FT			
AL -6101-LA-	Albuquerque LANL Facility Transition	0	4,500
	Subtotal: AL, LOS ALAMOS NATIONAL LABORATORY, FT	0	4,500
FIELD OFFICE: AL, INSTALLATION: LOS ALAMOS NATIONAL LABORATORY, CATEGORY: WM			
ALLA- 43-A -	High Explosive (HE) Wastewater Treatment	0	215
ALLA-3256- -	Mixed Waste Receiving and Storage Facility	6,640	3,075
ALLA-4137- -	Waste Minimization Planning	2,180	2,860
ALLA-4172- -	Facility Operations and Maintenance	36,819	61,033
ALLA-4173- -	General Plant Projects Waste Management	4,578	6,475
ALLA-4174- -	New Facility Planning	0	3,048
	Subtotal: AL, LOS ALAMOS NATIONAL LABORATORY, WM	50,217	76,706
	Subtotal: AL, LOS ALAMOS NATIONAL LABORATORY	107,165	161,624
FIELD OFFICE: AL, INSTALLATION: MOUND PLANT, CATEGORY: CA			
ALMD- 58- -	MD-CA-0058 ES&H Phase II	41	0
	Subtotal: AL, MOUND PLANT, CA	41	0
FIELD OFFICE: AL, INSTALLATION: MOUND PLANT, CATEGORY: ER			
ALMD-1165- -	Decommissioning of Building 21	0	0
ALMD-1167- -	Decommissioning of PLutinium Processing Building EW & EX Areas	2,106	55
ALMD-1170- -	Decommissioning of Special Metallurgical (SM) Building	6,551	9,409
ALMD-1172- -	Decommissioning of Semi-Works (SW) Cave Areas	234	1,197
ALMD-1174- -	Decommissioning of Semi-Works/Waste Disposal Buildings	2,619	333
ALMD-1175- -	Decommissioning of Underground Lines to Waste Disposal Building	931	2,599
ALMD-1176- -	Decommissioning of Waste Transfer System	1,149	0
ALMD-1194- -	Surveillance and Maintenance of D&D Areas	41	115
ALMD-1201- -	OU1 Area B Groundwater	6,351	2,960
ALMD-1202- -	OU2 Main Hill Seeps	0	311
ALMD-1203- -	OU3 Miscellaneous Sites	1,459	2,886
ALMD-1204- -	OU4 Miami-Erie Canal	1,104	860
ALMD-1205- -	OU5 Rad Contaminated Soils	448	311
ALMD-1206- -	OU6 D&D Sites Haz Con	553	1,752
ALMD-1209- -	OU9 Sitewide RI/FS	5,615	5,083
ALMD-1210- -	Program Management	1,850	2,627
ALMD-4024- -	D&D Program Management and NEPA Compliance	928	1,166
ALMD-4028- -	Decommissioning of EW Soil	2,938	3,200

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Activity Data Sheet
Sorted by Field Office, Installation, and Category
(dollars in thousands)

ADS Number	Title	FY92	FY93
	Subtotal: AL, MOUND PLANT, ER	34,877	34,864
FIELD OFFICE: AL, INSTALLATION: MOUND PLANT, CATEGORY: FT			
AL -6102-MD-	Albuquerque Mound Facility Transition	0	1,000
	Subtotal: AL, MOUND PLANT, FT	0	1,000
FIELD OFFICE: AL, INSTALLATION: MOUND PLANT, CATEGORY: WM			
ALMD-3100- -	Facility Operations and Maintenance	7,030	9,327
ALMD-3108-A -	New Facility Planning	270	83
ALMD-3113-A -	GPP Waste Management	0	0
ALMD-4014- -	Waste Minimization	135	219
	Subtotal: AL, MOUND PLANT, WM	7,435	9,629
	Subtotal: AL, MOUND PLANT	42,353	45,493
FIELD OFFICE: AL, INSTALLATION: PANTEX PLANT, CATEGORY: ER			
ALPX-1198-AR-	Chemical Releases Assessment/Remediation (AL-PX-12)	99	166
ALPX-1200-AR-	Construction Landfills Assessment/Remediation (AL-PX-7)	96	160
ALPX-1203-AR-	Fire Department Burn Pits Assessment/Remediation (AL-PX-5)	531	2,804
ALPX-1205-AR-	Firing Sites Assessment/Remediation (AL-PX-9)	106	83
ALPX-1207-AR-	Former Cooling Tower Assessment/Remediation (AL-PX-3)	597	236
ALPX-1212-AR-	High Explosive/Rad. Sites Assessment/Remediation (AL-PX-11)	114	199
ALPX-1213-AR-	Hypalon Pond Assessment and Remediation (AL-PX-RC-2)	1,146	0
ALPX-1215- -	NEPA Documentation - Assessment	41	0
ALPX-1216-AR-	Onsite Playas and Ditches Assessment/Remediation (AL-PX-8)	806	5,824
ALPX-1219-AR-	Priority Reconnaissance Assessment/Remediation (AL-PX-2)	105	2,808
ALPX-1220-AR-	Old Sewage Treatment Plant Assessment/Remediation (AL-PX-4)	534	193
ALPX-1222-AR-	Supplemental Sites Assessment/Remediation (AL-PX-13)	98	523
ALPX-1223-AR-	Underground Storage Tanks Assessment/Remediation (AL-PX-10)	938	1,354
ALPX-1227-AR-	Leaking Undergrd Stor Tank Assessment/Remediation (AL-PX-14)	269	3,060
ALPX-1229- -	ER Program Management	2,025	3,803
ALPX-1230-AR-	Zone 12 Groundwater Assessment/Remediation (AL-PX-6)	1,721	2,583
ALPX-1232-AR-	Burning Ground Assessment/Remediation (AL-PX-1)	859	5,254
ALPX-1235- -	Hydrogeologic Investigations	99	0
ALPX-1236- -	Interim Corrective Measures (Remediation)	0	0
	Subtotal: AL, PANTEX PLANT, ER	10,184	29,050
FIELD OFFICE: AL, INSTALLATION: PANTEX PLANT, CATEGORY: WM			
ALPX-3101- -	Waste Minimization Planning	810	1,125
ALPX-3102- -	Facility Operations and Maintenance	13,623	13,175
ALPX-3103- -	Hazardous Waste Treatment and Processing Facility	2,400	1,900

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Activity Data Sheet
Sorted by Field Office, Installation, and Category
(dollars in thousands)

ADS Number	Title	FY92	FY93
ALPX-3104- -	General Plant Projects Waste Management	1,048	600
ALPX-3105- -	New Facility Planning	0	0
	Subtotal: AL, PANTEX PLANT, WM	17,881	16,800
	Subtotal: AL, PANTEX PLANT	28,065	45,850
FIELD OFFICE: AL, INSTALLATION: PINELLAS PLANT, CATEGORY: ER			
ALPP-1001- -	4.5 Acre Site	676	1,277
ALPP-1003- -	Installation Groundwater	182	0
ALPP-1005- -	Miscellaneous Sites	1,525	4,189
ALPP-1007- -	NEPA Documentation (EA) - Assessment	101	105
ALPP-1010- -	PRP Participation	152	765
ALPP-1012- -	Sludge Holding Tank	0	14
ALPP-1013- -	Project Management	216	224
	Subtotal: AL, PINELLAS PLANT, ER	2,852	6,574
FIELD OFFICE: AL, INSTALLATION: PINELLAS PLANT, CATEGORY: FT			
AL -6103-PP-	Albuquerque Pinellas Facility Transition	0	200
	Subtotal: AL, PINELLAS PLANT, FT	0	200
FIELD OFFICE: AL, INSTALLATION: PINELLAS PLANT, CATEGORY: WM			
ALPP-3000- -	Facility Operations and Maintenance	1,751	2,519
ALPP-3001- -	Waste Minimization Planning	31	53
	Subtotal: AL, PINELLAS PLANT, WM	1,782	2,572
	Subtotal: AL, PINELLAS PLANT	4,634	9,346
FIELD OFFICE: AL, INSTALLATION: SANDIA NATIONAL LABORATORY ALBUQUER, CATEGORY: CA			
ALSA-1155- -	Corrective Activities Operating/CAP EQ	1,808	1,720
ALSA-1156- -	GPP Corrective Activities	1,500	520
	Subtotal: AL, SANDIA NATIONAL LABORATORY ALBUQUER, CA	3,308	2,240
FIELD OFFICE: AL, INSTALLATION: SANDIA NATIONAL LABORATORY ALBUQUER, CATEGORY: ER			
ALSA-1266- -	Central Coyote Test Field	0	300
ALSA-1267- -	Chemical Waste Landfill	1,145	1,797
ALSA-1270- -	Coyote Canyon Blast Area	177	1,929
ALSA-1272- -	Coyote Springs Area	0	213
ALSA-1273- -	Edgewood Test Site	0	176

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Activity Data Sheet
Sorted by Field Office, Installation, and Category
(dollars in thousands)

ADS Number	Title	FY92	FY93
ALSA-1281- -	Kauai Test Facility	0	475
ALSA-1282- -	Lurance Canyon	205	259
ALSA-1284- -	Multi-Party Sites	2,750	149
ALSA-1285- -	NEPA Assessment	95	332
ALSA-1288- -	Pendulum Area	0	198
ALSA-1289- -	Mixed Waste Landfill	1,808	3,899
ALSA-1292- -	Sandia Engineering Reactor D&D	33	38
ALSA-1293- -	Schoolhouse Mesa Test Site	0	327
ALSA-1295- -	Septic Tanks and Drainfields	274	2,121
ALSA-1297- -	South Coyote Test Field	0	300
ALSA-1298- -	SW Coyote Test Field	0	350
ALSA-1300- -	Leaking Underground Storage Tanks (LUST)	280	418
ALSA-1302- -	Tech Area 1	0	468
ALSA-1303- -	Tech Area 2	614	678
ALSA-1306- -	Tech Area 3 and 5	586	508
ALSA-1307- -	Liquid Waste Disposal	1,230	739
ALSA-1308- -	Thunder Range	0	344
ALSA-1309- -	Tijeras Arroyo	0	327
ALSA-1311- -	Tonopah Test Range area 9	0	300
ALSA-1312- -	Tonapah test Range Area 3	0	239
ALSA-1313- -	Tonapah Test Range, Test Area	0	257
ALSA-1326- -	Project Management	3,064	3,959
ALSA-1327- -	Remote Facilities	0	416
ALSA-1330- -	Site-Wide Hydrogeologic Characterization	12	3,775
	Subtotal: AL, SANDIA NATIONAL LABORATORY ALBUQUER, ER	12,273	25,291
FIELD OFFICE: AL, INSTALLATION: SANDIA NATIONAL LABORATORY ALBUQUER, CATEGORY: WM			
ALSA-1114- -	Waste Minimization Planning	546	595
ALSA-1133- -	Facility Operations and Maintenance	14,522	14,605
ALSA-1136- -	New Facility Planning	711	250
ALSA-1137- -	GPP Waste Management	1,092	600
	Subtotal: AL, SANDIA NATIONAL LABORATORY ALBUQUER, WM	16,871	16,050
	Subtotal: AL, SANDIA NATIONAL LABORATORY ALBUQUER	32,452	43,581
FIELD OFFICE: AL, INSTALLATION: SANDIA NATIONAL LABORATORY LIVERMOR, CATEGORY: CA			
ALSL- 103- -	Corrective Activities	755	0
	Subtotal: AL, SANDIA NATIONAL LABORATORY LIVERMOR, CA	755	0
FIELD OFFICE: AL, INSTALLATION: SANDIA NATIONAL LABORATORY LIVERMOR, CATEGORY: ER			
ALSL-1350- -	Remediation Program Management/Technical Support	1,518	2,312
ALSL-1351- -	Fuel Oil Spill Assessment/Remediation	2,582	1,306
ALSL-1352- -	Navy Landfill Assessment/Remediation	146	150

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Activity Data Sheet
Sorted by Field Office, Installation, and Category
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ADS Number	Title	FY92	FY93
ALSL-1353- -	Miscellaneous Sites Assessment	83	0
	Subtotal: AL, SANDIA NATIONAL LABORATORY LIVERMOR, ER	4,329	3,768
FIELD OFFICE: AL, INSTALLATION: SANDIA NATIONAL LABORATORY LIVERMOR, CATEGORY: WM			
ALSL-3800- -	Facility Operations and Maintenance	1,522	1,623
ALSL-7300- -	Waste Minimization Planning	164	243
	Subtotal: AL, SANDIA NATIONAL LABORATORY LIVERMOR, WM	1,686	1,866
	Subtotal: AL, SANDIA NATIONAL LABORATORY LIVERMOR	6,770	5,634
FIELD OFFICE: AL, INSTALLATION: URANIUM MILL TAILINGS (REMEDIAL ACT, CATEGORY: ER			
ALUM-1322- -	UMTRA Surface Ambrosia Lake Remediation (16)	3,382	6,614
ALUM-1325- -	UMTRA Surface Belfield/Bowman Remediation (25)	524	1,316
ALUM-1330- -	UMTRA Surface Falls City Remediation (20)	6,941	8,645
ALUM-1332- -	UMTRA Surface Grand Junction Remediation (05)	79,917	72,476
ALUM-1337- -	UMTRA Surface Gunnision Remediation (08)	9,613	7,484
ALUM-1341- -	UMTRA Surface Lowman Remediation (12)	105	8
ALUM-1344- -	UMTRA SURFACE MAYBELL REMEDIATION (14)	743	239
ALUM-1346- -	UMTRA Surface Mexican Hat Remediation (09)	3,554	8,472
ALUM-1349- -	UMTRA Surface Monument Valley Remediation (19)	8,886	6,596
ALUM-1351- -	UMTRA Surface Naturita Remediation (17)	560	276
ALUM-1354- -	UMTRA Surface Rifle (2 Sites) Remediation (06)	15,148	26,749
ALUM-1361- -	UMTRA Surface Slick Rock (2 Sites) Remediation (11)	484	868
ALUM-1362- -	UMTRA Surface Program Management Support	20,329	14,781
ALUM-1363- -	UMTRA Surface Surveillance and Maintenance	1,086	862
ALUM-1364- -	UMTRA Surface Completed Sites Remediation	82	35
ALUM-1365- -	UMTRA Surface State Share	-11,454	-12,321
ALUM-2000- -	UMTRA Groundwater Remedial Action (All Sites)	2,000	4,600
	Subtotal: AL, URANIUM MILL TAILINGS (REMEDIAL ACT, ER	141,900	147,700
	Subtotal: AL, URANIUM MILL TAILINGS (REMEDIAL ACT	141,900	147,700
FIELD OFFICE: AL, INSTALLATION: WASTE ISOLATION PILOT PLANT, CATEGORY: WM			
ALWP-3234- -	Base Waste Management - Storage	140,963	185,000
	Subtotal: AL, WASTE ISOLATION PILOT PLANT, WM	140,963	185,000
	Subtotal: AL, WASTE ISOLATION PILOT PLANT	140,963	185,000
	Subtotal: AL	578,477	711,549

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Activity Data Sheet
Sorted by Field Office, Installation, and Category
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ADS Number	Title	FY92	FY93
FIELD OFFICE: CH, INSTALLATION: AMES LABORATORY, IOWA STATE UNIV., CATEGORY: ER			
CH -5201- -	UST Contamination Assessment/Remediation	0	83
CH -5202-EW-	Ames Chemical Disposal Site (ACDS) RI/FS & RD/RA	0	500
CH -5202-EX-	Ames Chemical Disposal Site (ACDS) RI/FS & RD/RA	0	500
CH -5203- -	Program Management	0	0
CH -5204- -	Inactive Waste Site Characterization Activities	0	0
	Subtotal: CH, AMES LABORATORY, IOWA STATE UNIV., ER	0	1,083
FIELD OFFICE: CH, INSTALLATION: AMES LABORATORY, IOWA STATE UNIV., CATEGORY: WM			
CH -5100- -	Waste Management Operations	205	164
	Subtotal: CH, AMES LABORATORY, IOWA STATE UNIV., WM	205	164
	Subtotal: CH, AMES LABORATORY, IOWA STATE UNIV.	205	1,247
FIELD OFFICE: CH, INSTALLATION: ARGONNE EAST, CATEGORY: CA			
CH -1306- -	Sanitary Waste Water Treatment Plant Improvements and Upgrade	3,500	532
CH -1307-00-00	800 Area Landfill Leachate Collection/Treatment	0	513
CH -1308- -	Laboratory and Sanitary Sewer Collection System Rehab	832	0
CH -1309- -	Laboratory Waste Waster Treatment Plant Improvements/Upgrade	3,185	0
CH -1311- -	Canal Water Treatment Rehabilitation	375	827
CH -1312- -	Chloride Removal Plant	240	130
CH -1313- -	Cooling Tower Blowdown Water Diversion	103	0
	Subtotal: CH, ARGONNE EAST, CA	8,235	2,002
FIELD OFFICE: CH, INSTALLATION: ARGONNE EAST, CATEGORY: ER			
CH -1400- -	Program Management	0	50
CH -1401- -	800 Area Landfill Remedial Activities	369	873
CH -1402- -	East Area Sewage Treatment Plant	0	0
CH -1403- -	570 Holding Pond	0	290
CH -1404- -	Sawmill Creek Remedial Activities	0	26
CH -1405- -	317/319/ENE Area	376	2,973
CH -1406- -	100 Area	225	0
CH -1407- -	Outfall Area	0	270
CH -1408-A -	Sitewide Hydrogeological Baseline Study	0	200
CH -1408-B -	Sitewide Well and Borehole Closure	0	15
CH -1409-A -	Inactive Waste Sites Management Plan	0	100
CH -1409-B -	Solid Waste Management Units Assessment	0	300
CH -1411- -	Lime Sludge Removal	0	150
CH -1412- -	D&D of the Experimental Boiling Water Reactor (EBWR)	2,275	2,650
CH -1413- -	D&D of the CP-5 Reactor	188	4,723
CH -1414- -	D&D of the Hot Cells	765	3,500
CH -1415- -	D&D of the Juggernaut Reactor	0	0

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Activity Data Sheet
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ADS Number	Title	FY92	FY93
CH -1416- -	D&D of the Argonne Thermal Source Reactor (ATSR)	0	0
CH -1417- -	D&D of the 60" Cyclotron	0	0
CH -1418- -	D&D of the ZPR Reactor Facilities, Building 315	0	0
CH -1420- -	Eastern D&D Technical Criteria and Guidance Assistance	158	175
CH -1421- -	FUSRAP Technical Criteria and Guidance Assistance	100	175
CH -1422- -	FUSRAP NEPA Process Planning and Implementation	880	500
CH -1423- -	ERWP NEPA Process Planning and Implementation	1,170	1,400
	Subtotal: CH, ARGONNE EAST, ER	6,506	18,370
FIELD OFFICE: CH, INSTALLATION: ARGONNE EAST, CATEGORY: FT			
CH -6201-AE-	Transition Program	0	0
	Subtotal: CH, ARGONNE EAST, FT	0	0
FIELD OFFICE: CH, INSTALLATION: ARGONNE EAST, CATEGORY: WM			
CH -1300- -	Continuity of Operations	1,135	515
CH -1301-A -	WM Projects Non-Defense	1,160	789
CH -1301-B -	Continuity of Operations	8,488	12,627
CH -1303-00-00	Rehabilitation of Waste Management Building	400	1,729
CH -1304-00-00	Hazardous, Radioactive & Mixed Waste Storage Facilities Upg	425	1,231
CH -1305-00-00	UST Upgrade/Replacement	0	245
CH -8104-EX-	Work for Others/Non-Defense	150	0
	Subtotal: CH, ARGONNE EAST, WM	11,758	17,136
	Subtotal: CH, ARGONNE EAST	26,499	37,508
FIELD OFFICE: CH, INSTALLATION: ARGONNE WEST, CATEGORY: CA			
CH -1603- -	Corrective Activities	529	247
	Subtotal: CH, ARGONNE WEST, CA	529	247
FIELD OFFICE: CH, INSTALLATION: ARGONNE WEST, CATEGORY: ER			
CH -1700- -	Program Management	241	472
CH -1701- -	PCB Spill Cleanup	480	0
CH -1702- -	WAG 9 Assessment	163	460
CH -1703- -	CLPA Decontamination & Decommissioning	3	53
	Subtotal: CH, ARGONNE WEST, ER	887	985
FIELD OFFICE: CH, INSTALLATION: ARGONNE WEST, CATEGORY: WM			
CH -1601- -	Facility Operations and Maintenance (Non-Defense)	2,239	1,928
CH -1602- -	General Plant Project Waste Management (Non-Defense)	129	307

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Activity Data Sheet
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ADS Number	Title	FY92	FY93
CH -1604- -	New Facilities Planning (Defense)	0	315
	Subtotal: CH, ARGONNE WEST, WM	2,368	2,550
	Subtotal: CH, ARGONNE WEST	3,784	3,782
FIELD OFFICE: CH, INSTALLATION: BATTELLE COLUMBUS LABORATORIES, CATEGORY: ER			
CH -6202-EW-	BCLDP Decontamination and Decommissioning	2,683	62
CH -6202-EX-	BCLDP Decontamination and Decommissioning	5,273	10,414
CH -6203-EW-	BCLDP Program Management Support	1,458	28
CH -6203-EX-	BCLDP Program Management Support	2,864	5,067
CH -6204-EW-	BCLDP Waste Transportation and Disposal	1,003	16
CH -6204-EX-	BCLDP Waste Transportation and Disposal	1,971	2,400
CH -6205-EW-	BCLDP Facility Maintenance	328	4
CH -6205-EX-	BCLDP Facility Maintenance	646	1,726
	Subtotal: CH, BATTELLE COLUMBUS LABORATORIES, ER	16,226	19,717
	Subtotal: CH, BATTELLE COLUMBUS LABORATORIES	16,226	19,717
FIELD OFFICE: CH, INSTALLATION: BROOKHAVEN NATIONAL LABORATORY, CATEGORY: ER			
CH -2300- -	Program Management	1,406	2,068
CH -2301- -	Brookhaven Graphite Research Reactor D&D (BGRR)	0	0
CH -2302- -	Sitewide Activities	0	990
CH -2303- -	Operable Unit I	2,119	1,884
CH -2304- -	Operable Unit II	0	0
CH -2305- -	Operable Unit III	0	192
CH -2306- -	Operable Unit IV	641	628
CH -2307- -	Operable Unit V	0	192
CH -2308- -	Operable Unit VI	0	0
CH -2309- -	Operable Unit VII	0	0
CH -2310- -	Removal Activities	0	312
	Subtotal: CH, BROOKHAVEN NATIONAL LABORATORY, ER	4,166	6,266
FIELD OFFICE: CH, INSTALLATION: BROOKHAVEN NATIONAL LABORATORY, CATEGORY: FT			
CH -6202-BN-	Brookhaven Facility Transition Activities	0	0
	Subtotal: CH, BROOKHAVEN NATIONAL LABORATORY, FT	0	0
FIELD OFFICE: CH, INSTALLATION: BROOKHAVEN NATIONAL LABORATORY, CATEGORY: WM			
CH -2202- -	Waste Management Facility Phase II	0	700
CH -2203- -	Waste Minimization Facility Upgrades	1,638	53
CH -2204- -	Floor Drain Reconnection	0	959

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Activity Data Sheet
Sorted by Field Office, Installation, and Category
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ADS Number	Title	FY92	FY93
CH -2222- -	Hazardous/Radioactive Waste Disposal Operations	5,217	5,117
	Subtotal: CH, BROOKHAVEN NATIONAL LABORATORY, WM	6,855	6,829
	Subtotal: CH, BROOKHAVEN NATIONAL LABORATORY	11,021	13,095
FIELD OFFICE: CH, INSTALLATION: CH, CATEGORY: ER			
CH -8200-EW-	Chicago Operations Program Management Support - Defense	900	419
CH -8200-EW-B	CH Operations Program Management Support	0	315
CH -8201- -	Agreements in Principle/IAG	0	770
CH -8204- -	Site A - Surveillance and Maintenance	112	120
CH -8205- -	Decommissioning of the SPRU facility	0	500
	Subtotal: CH, CH, ER	1,012	2,124
FIELD OFFICE: CH, INSTALLATION: CH, CATEGORY: WM			
CH -8101-EW-	Program Integration	600	1,020
CH -8101-EX-	Program Integration	550	0
CH -8102- -	Program Support for Agreements in Principle - Idaho	0	272
CH -8103-EW-	Waste Minimization Planning	10	94
CH -8103-EX-	Waste Minimization Planning	44	0
CHHQ-3031-1 -	Program Direction	648	756
	Subtotal: CH, CH, WM	1,852	2,142
	Subtotal: CH, CH	2,864	4,266
FIELD OFFICE: CH, INSTALLATION: FERMILAB, CATEGORY: CA			
CH -4100-EX-	Main Ring Service Buildings PCB Contamination Cleanup	117	501
	Subtotal: CH, FERMILAB, CA	117	501
FIELD OFFICE: CH, INSTALLATION: FERMILAB, CATEGORY: ER			
CH -4200- -	Chromate Contamination Cleanup	13	47
	Subtotal: CH, FERMILAB, ER	13	47
FIELD OFFICE: CH, INSTALLATION: FERMILAB, CATEGORY: WM			
CH -4100- -	Waste Management Activities	1,524	1,446
CH -4101-01-	Low-Level Radioactive Waste Sorting and Repackaging Building	0	1,200
	Subtotal: CH, FERMILAB, WM	1,524	2,646

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Activity Data Sheet
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ADS Number	Title	FY92	FY93
	Subtotal: CH, FERMILAB	1,654	3,194
FIELD OFFICE: CH, INSTALLATION: HALLAM, NEBRASKA, CATEGORY: ER			
CH -8202- -	Hallam Surveillance and Maintenance	58	16
	Subtotal: CH, HALLAM, NEBRASKA, ER	58	16
	Subtotal: CH, HALLAM, NEBRASKA	58	16
FIELD OFFICE: CH, INSTALLATION: PIQUA, OHIO, CATEGORY: ER			
CH -8203- -	Piqua Surveillance and Maintenance	18	20
	Subtotal: CH, PIQUA, OHIO, ER	18	20
	Subtotal: CH, PIQUA, OHIO	18	20
FIELD OFFICE: CH, INSTALLATION: PRINCETON PLASMA PHYSICS LABORATORY, CATEGORY: CA			
CH -3102-01-	Underground Storage Tank Remediation	422	0
	Subtotal: CH, PRINCETON PLASMA PHYSICS LABORATORY, CA	422	0
FIELD OFFICE: CH, INSTALLATION: PRINCETON PLASMA PHYSICS LABORATORY, CATEGORY: ER			
CH -3200- -	Program Management Support	0	0
CH -3201- -	Groundwater Characterization/Remediation	0	0
CH -3202- -	CERCLA Past Waste Site Investigation	0	0
	Subtotal: CH, PRINCETON PLASMA PHYSICS LABORATORY, ER	0	0
FIELD OFFICE: CH, INSTALLATION: PRINCETON PLASMA PHYSICS LABORATORY, CATEGORY: WM			
CH -3100- -	Waste Operations	1,499	1,344
CH -3101-01-	Upgrade to Existing Hazardous Materials Storage Facility	90	737
	Subtotal: CH, PRINCETON PLASMA PHYSICS LABORATORY, WM	1,589	2,081
	Subtotal: CH, PRINCETON PLASMA PHYSICS LABORATORY	2,011	2,081
	Subtotal: CH	64,340	84,926
FIELD OFFICE: FS, INSTALLATION: FERNALD SITE OFFICE, CATEGORY: ER			
FS - 8-B1-	Project Management	22,076	28,105

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Activity Data Sheet
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ADS Number	Title	FY92	FY93
FS - 10-B4-	RMI Site	2,900	16,488
FS - 16-C3-	Waste Management	17,555	33,512
FS - 30-B2-	Regulatory Oversight	500	500
FS - 37-A3-	Litigation Settlement	52,052	0
FS - 46-B2-	Operable Unit 1	10,218	23,854
FS - 47-B2-	Operable Unit 2	4,305	11,384
FS - 48-B2-	Operable Unit 3	2,998	56,805
FS - 49-B2-	Response Action - Operable Unit 4	3,290	11,597
FS - 50-B2-	Operable Unit 5	20,121	20,768
FS - 52-B2-	Remedial Support Facilities	1,885	3,727
FS - 60-D1-	Ongoing Litigation	9,122	13,100
FS - 64-D1-	Long Term Monitoring	12,867	17,738
FS - 68-D1-	Base Services	29,545	42,767
FS - 69-D1-	Project Support	21,968	27,588
	Subtotal: FS, FERNALD SITE OFFICE, ER	211,402	307,933
	Subtotal: FS, FERNALD SITE OFFICE	211,402	307,933
	Subtotal: FS	211,402	307,933
FIELD OFFICE: HQ, INSTALLATION: HEADQUARTERS, CATEGORY: CA			
HQ - 1-CA-	Program Support	7,323	0
	Subtotal: HQ, HEADQUARTERS, CA	7,323	0
FIELD OFFICE: HQ, INSTALLATION: HEADQUARTERS, CATEGORY: ER			
HQ - 2-00-	Technical Support to Enviroimental Restoration Program	7,262	8,467
HQ - 100-AA-	Technical Support Environmental Restoration Program	66,244	73,689
HQ - 100-NW-	Northwestern Area Project Support	0	0
HQ - 199-18-	Program Direction	11,588	13,789
HQ - 199-FO-	Field Office Program Direction	26,245	28,111
HQ -2406-19-	Maxey Flats Disposal Site	750	2,000
	Subtotal: HQ, HEADQUARTERS, ER	112,089	126,056
FIELD OFFICE: HQ, INSTALLATION: HEADQUARTERS, CATEGORY: FT			
HQ -6001-HQ-	Program Direction	0	0
HQ -6002-HQ-	Support to Transition Activities	0	0
	Subtotal: HQ, HEADQUARTERS, FT	0	0
FIELD OFFICE: HQ, INSTALLATION: HEADQUARTERS, CATEGORY: PD			
HQ -1005- -	STGWG and Stakeholders Support	0	0

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ADS Number	Title	FY92	FY93
HQ -1009- -	ADP/AOSS	6,000	24,664
HQ -1010- -	EM-10 Contracting Activity	6,344	4,802
HQ -1012- -	Program Direction	8,405	9,117
HQ -2000- -	Deputy Assistant Secretary For Oversight and Self-Assessment	4,000	12,217
	Subtotal: HQ, HEADQUARTERS, PD	24,749	50,800
FIELD OFFICE: HQ, INSTALLATION: HEADQUARTERS, CATEGORY: TD			
HQ - 0-ED-00	Tech Integration and Education	29,000	35,800
HQ - 0-EM-SL	Environmental and Molecular Science Laboratory	17,100	28,500
HQ - 0-GS-00	Groundwater & Soil Cleanup	59,600	60,830
HQ - 0-IS-00	Supporting Technologies & Infrastructure Programs	29,165	42,800
HQ - 0-PD-00	Program Direction Activities	15,100	15,570
HQ - 0-PS-00	Program Management and Support Activities	39,317	36,400
HQ - 0-RD-	RDDT&E Innovation Investment Area	49,660	84,000
HQ - 0-WM-	Waste Minimization and Avoidance	7,400	2,200
HQ - 0-WR-	Waste Retrieval and Processing Investment Areas	57,100	59,300
	Subtotal: HQ, HEADQUARTERS, TD	303,442	365,400
FIELD OFFICE: HQ, INSTALLATION: HEADQUARTERS, CATEGORY: TR			
HQ - 0-TM-	Transportation Management Program	18,870	19,800
	Subtotal: HQ, HEADQUARTERS, TR	18,870	19,800
FIELD OFFICE: HQ, INSTALLATION: HEADQUARTERS, CATEGORY: WM			
HQ -3030-01-	Support for the Office of Waste Management (EM30)	29,020	24,097
HQ -3030-02-	High Level Waste Disposal Fee	7,500	0
HQ -3030-03-	Support for the Office of Waste Management - Non-Defense	3,629	100
HQ -3031-01-	Program Direction	16,673	13,840
HQ -3032-01-	Support for the Office of Waste Operations	15,083	12,983
HQ -3032-02-	Waste Analytical Laboratory	0	5,000
HQ -3033-01-	Support to the Office of Program Support	11,194	10,687
HQ -3034-01-	Support to the Waste Management Projects Office	13,680	5,067
HQ -3035-01-	Support to the Office of Technical Support - Defense	14,500	12,600
HQ -3035-02-	National Low-Level Waste Program - Non-Defense	2,025	7,000
HQ -3036-01-	Support for the Hanford Program Office	23,443	38,000
	Subtotal: HQ, HEADQUARTERS, WM	136,747	129,374
	Subtotal: HQ, HEADQUARTERS	603,220	691,430
	Subtotal: HQ	603,220	691,430
FIELD OFFICE: ID, INSTALLATION: IDAHO CHEMICAL PROCESSING PLANT, CATEGORY: CA			
ID -1009-WN-	Corrective Activities	7,000	0

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ADS Number	Title	FY92	FY93
	Subtotal: ID, IDAHO CHEMICAL PROCESSING PLANT, CA	7,000	0
FIELD OFFICE: ID, INSTALLATION: IDAHO CHEMICAL PROCESSING PLANT, CATEGORY: FT			
ID -6301-CP-	Idaho ICPP Facilities Transition	0	300
	Subtotal: ID, IDAHO CHEMICAL PROCESSING PLANT, FT	0	300
FIELD OFFICE: ID, INSTALLATION: IDAHO CHEMICAL PROCESSING PLANT, CATEGORY: WM			
ID -1001-WN-	Waste Operations	40,650	42,867
ID -1002-WN-	Facility Operations and Maintenance	16,747	22,466
ID -1003-WN-	General Plant Projects	166	4,490
ID -1004-WN-	New Facilities Planning	1,845	1,870
ID -1005-WN-	HLW Tank Farm Replacement - Phase I	27,519	61,150
ID -1006-WN-	Nox Abatement	2,720	7,320
ID -1008-WN-	New ICPP Mission Activities	0	31,000
	Subtotal: ID, IDAHO CHEMICAL PROCESSING PLANT, WM	89,647	171,163
	Subtotal: ID, IDAHO CHEMICAL PROCESSING PLANT	96,647	171,463
FIELD OFFICE: ID, INSTALLATION: IDAHO FIELD OFFICE, CATEGORY: WM			
ID -3031-1 -	Program Direction	14,060	22,626
ID -3035-2A-	Greater-than-Class-C Program	1,000	0
ID -3035-2B-	National Low-Level Waste Program	5,500	0
	Subtotal: ID, IDAHO FIELD OFFICE, WM	20,560	22,626
	Subtotal: ID, IDAHO FIELD OFFICE	20,560	22,626
FIELD OFFICE: ID, INSTALLATION: IDAHO NATIONAL ENGINEERING LAB, CATEGORY: ER			
ID - 28-EG-	WAG 1 TAN - Test Area North Assessment/Cleanup	4,980	8,855
ID - 30-EG-	WAG 2 TRA - Test Reactor Area Assessment and Remediation	7,239	5,228
ID - 34-EG-	WAG 4/CFA - Central Facilities Area Assessment/Cleanup	1,576	1,391
ID - 36-EG-	WAG 5 - PBF & ARA Assessment/Cleanup	1,236	581
ID - 38-EG-	WAG 6 - EBR-1/Borax Assessment/Cleanup	564	1,303
ID - 40-EG-	WAG 7/RWMC - Radioactive Waste Management Complex/Buried Waste Pr	16,919	34,840
ID - 41-EG-	WAG 10 - Misc. Units Assessment/Cleanup	2,058	5,791
ID - 45-EG-	S&M-D&D Surveillance and Maintenance	315	316
ID - 46-EG-	ARFVS/NAK D&D Cleanup	715	0
ID - 48-EG-	ARA II D&D	430	725
ID - 49-EG-	ARA III D&D	380	636
ID - 50-EG-	WRRTF Hot Waste Tank	0	0
ID - 51-EG-	TAN - TSF D&D	0	0

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Activity Data Sheet
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ADS Number	Title	FY92	FY93
ID - 52-EG-	ARA I D&D	0	214
ID - 53-EG-	TAN 607 Decon Shop D&D	0	0
ID - 54-EG-	MTR D&D	0	0
ID - 58-EG-	CFA-669 Hot Laundry D&D	410	382
ID - 60-EG-	ETR D&D	0	0
ID - 63-EG-	Borax-V D&D	1,040	700
ID - 64-EG-	SPERT IV Waste Holdup Tank and Piping	314	0
ID - 65-EG-	Loft Ancillaries D&D	350	719
ID - 67-EG-	TTAF D&D	0	0
ID - 102-EG-	Inactive Underground Storage Tanks	906	1,494
ID - 103-E1-	INEL ER Tiger Team	200	500
ID - 111-E1-	Program Management Support	15,191	19,573
ID - 112-E1-	FFA/CO Grant to Idaho	1,600	1,600
ID - 112-E2-	SHOSHONE - BANNOCK	200	208
ID -1204-WN-	WAG 3 Environmental Restoration - Assessment and Cleanup	4,600	3,936
ID -1304-WN-	CPP-603 Decontamination and Demolition	0	0
ID -1305-WN-	SFE-20/CPP-740 D&D Activities	50	52
ID -1306-WN-	CPP-631, -709, -734, CRS D&D Programs	511	374
ID -1307-WN-	CPP-640 D&D	40	21
ID -1308-WN-	CPP-601 D & D	0	0
ID -1309-WN-	Waste Calcine Facility Decontamination and Decommissioning	503	235
ID -1310-WN-	Tank Farm Decontamination and Decommissioning	0	0
ID -1311-WN-	WINCO Post D&D S&M Program	42	44
	Subtotal: ID, IDAHO NATIONAL ENGINEERING LAB, ER	62,369	89,718
FIELD OFFICE: ID, INSTALLATION: IDAHO NATIONAL ENGINEERING LAB, CATEGORY: WM			
ID -1321- -	INEL Landlord Infrastructure Support	21,565	20,494
ID -1322- -	INEL Fire and Life Safety Improvement	3,000	8,000
ID -1323- -	INEL Electrical Upgrade	80	1,000
ID -1324- -	INEL Sewer System Upgrade	2,100	3,700
ID -1325- -	INEL Transportation Complex	895	5,860
ID -1327- -	General Plant Projects Landlord	5,770	4,980
ID -3452- -	INEL New Facility Planning	0	1,035
ID -4103-EG-	Waste Minimization/Pollution Prevention	2,740	2,263
ID -4104-EG-	Agreements in Principle	2,974	3,231
ID -4301-EG-	Facility Operations and Maintenance	23,149	39,113
ID -4302-EG-	New Facility Planning	3,977	6,396
ID -4303-EG-	General Plant Projects (GPP)	985	6,262
ID -4306-EG-	Solid Waste Transfer Station (LI)	5,129	125
ID -4307-EG-	Dry Cask Storage Project (LI)	589	2,870
ID -4308-EG-	TSA Retrieval Enclosure Facility (LI)	5,302	2,140
ID -4309-EG-	Waste Characterization and Storage Facility (LI)	26,300	43,000
ID -4310-EG-	Waste Reduction Operations Complex	8,824	13,192
ID -4311-EG-	Radioactive Waste Management Complex	15,739	22,358
ID -4312-EG-	Text Area North	3,475	3,875
	Subtotal: ID, IDAHO NATIONAL ENGINEERING LAB, WM	132,593	189,894

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Activity Data Sheet
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ADS Number	Title	FY92	FY93
	Subtotal: ID, IDAHO NATIONAL ENGINEERING LAB	194,962	279,612
FIELD OFFICE: ID, INSTALLATION: WEST VALLEY, CATEGORY: WM			
ID -4001-WV-	West Valley Demondirection Project	104,000	134,000
	Subtotal: ID, WEST VALLEY, WM	104,000	134,000
	Subtotal: ID, WEST VALLEY	104,000	134,000
	Subtotal: ID	416,169	607,701
FIELD OFFICE: NV, INSTALLATION: NEVADA FIELD OFFICE, CATEGORY: WM			
NV -3031-1 -	Program Direction	692	1,125
	Subtotal: NV, NEVADA FIELD OFFICE, WM	692	1,125
	Subtotal: NV, NEVADA FIELD OFFICE	692	1,125
FIELD OFFICE: NV, INSTALLATION: NEVADA OFF-SITE LOCATIONS, CATEGORY: ER			
NV - 231-AA-	ALASKA Remedial Actions	0	0
NV - 232-AA-	COLORADO Remedial Actions	0	0
NV - 233-AA-	MISSISSIPPI Remedial Actions	695	2,122
NV - 234-AA-	NEVADA Remedial Actions	0	0
NV - 235-AA-	NEW MEXICO Remedial Actions	0	0
	Subtotal: NV, NEVADA OFF-SITE LOCATIONS, ER	695	2,122
	Subtotal: NV, NEVADA OFF-SITE LOCATIONS	695	2,122
FIELD OFFICE: NV, INSTALLATION: NEVADA TEST SITE, CATEGORY: CA			
NV - 336-AA-	Corrective Activities	1,660	0
NV - 337-AA-	GPP Corrective Activities	250	0
	Subtotal: NV, NEVADA TEST SITE, CA	1,910	0
FIELD OFFICE: NV, INSTALLATION: NEVADA TEST SITE, CATEGORY: ER			
NV - 201-AA-	Program Management Support	2,934	4,023
NV - 211-AA-	Plutonium Soils	276	0
NV - 212-AA-	Groundwater Characterization Project	18,276	25,202
NV - 213-AA-	Test Areas	0	0

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ADS Number	Title	FY92	FY93
NV - 214-AA-	RCRA Industrial Sites	2,279	3,830
NV - 215-AA-	CERCLA Industrial Sites	0	0
NV - 221-AA-	Decontamination and Decommissioning Facilities	189	0
	Subtotal: NV, NEVADA TEST SITE, ER	23,954	33,055
FIELD OFFICE: NV, INSTALLATION: NEVADA TEST SITE, CATEGORY: WM			
NV - 331-AA-	Program Control	1,800	3,345
NV - 332-AA-	Waste Minimization Planning	700	600
NV - 333-AA-	Facilities Operations and Maintenance	9,902	12,123
NV - 335-AA-	GPP Waste Management	1,301	4,264
	Subtotal: NV, NEVADA TEST SITE, WM	13,703	20,332
	Subtotal: NV, NEVADA TEST SITE	39,567	53,387
	Subtotal: NV	40,954	56,634
FIELD OFFICE: OR, INSTALLATION: FORMERLY UTILIZED SITES REMEDIAL A, CATEGORY: ER			
OR -1301-AA-	NEW YORK Sites - Assessment & Cleanup	15,736	19,193
OR -1302-AA-	NEW JERSEY Sites - Assessment & Cleanup	11,140	3,874
OR -1303-AA-	MISSOURI Sites - Assessment & Cleanup	8,369	6,594
OR -1304-AA-	Other Sites - Assessment & Cleanup	10,988	9,064
OR -1310-AA-	ORNL FUSRAP Support	1,005	800
	Subtotal: OR, FORMERLY UTILIZED SITES REMEDIAL A, ER	47,238	39,525
	Subtotal: OR, FORMERLY UTILIZED SITES REMEDIAL A	47,238	39,525
FIELD OFFICE: OR, INSTALLATION: OAK RIDGE GASEOUS DIFFUSION PLANT, CATEGORY: CA			
OR -4102- -	Corrective Activities	390	0
OR -4103- -	General Plant Projects, CA	1,425	554
	Subtotal: OR, OAK RIDGE GASEOUS DIFFUSION PLANT, CA	1,815	554
FIELD OFFICE: OR, INSTALLATION: OAK RIDGE GASEOUS DIFFUSION PLANT, CATEGORY: ER			
OR -4301- -	Main Plant Area	3,298	10,864
OR -4302- -	Process Plant Area Remedial Action	0	426
OR -4303- -	External Plant Area	0	2,045
OR -4304- -	Pond Waste Management Project	28,000	13,218
OR -4305- -	Groundwater Protection Program	172	1,227
OR -4306- -	Surveillance and Maintenance of Inactive Waste Sites	0	850
OR -4401- -	Landlord Capital Equipment	8,500	909

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ADS Number	Title	FY92	FY93
OR -4402- -	Landlord Capital Construction	0	8,381
OR -4501- -	Program Management	0	1,870
OR -4701-01-	K-25 Facility Decontamination and Decommissioning	16,824	57,591
OR -8303- -	Contract Management Support	5,355	2,928
OR -8304- -	Technical Integration	7,698	4,367
OR -9302- -	Watts Bar Reservoir	3,525	5,350
OR -9303- -	Non-FFA Projects	520	1,414
	Subtotal: OR, OAK RIDGE GASEOUS DIFFUSION PLANT, ER	73,892	111,440
FIELD OFFICE: OR, INSTALLATION: OAK RIDGE GASEOUS DIFFUSION PLANT, CATEGORY: WM			
OR -4101- -	Sewage Collection System Rehabilitation, WM	0	7,500
OR -4201- -	Facility Operations & Maintenance	24,438	27,142
OR -4202- -	Site-Wide Activities	3,911	4,857
OR -4203- -	Disposal of K-1515 Sanitary Water Treatment Plant Waste	0	1,500
OR -4204- -	TSCA Incinerator	25,510	28,897
OR -4205- -	Filter Test Facility	301	324
OR -4206- -	General Plant Projects, WM, Defense	621	2,647
OR -4207- -	New Facility Planning	500	757
OR -8203- -	Reservation Support	5,899	8,228
OR -8204- -	Waste Minimization Planning	0	477
OR -8205- -	Program Support	1,000	5,000
OR -9203- -	OAK RIDGE Storage Facilities	0	4,000
	Subtotal: OR, OAK RIDGE GASEOUS DIFFUSION PLANT, WM	62,180	91,329
	Subtotal: OR, OAK RIDGE GASEOUS DIFFUSION PLANT	137,887	203,323
FIELD OFFICE: OR, INSTALLATION: OAK RIDGE NATIONAL LABORATORY, CATEGORY: CA			
OR -3101- -	Bethel Valley LLLW-CAT System Upgrade	1,379	0
OR -3102- -	Melton Valley LLLW CAT SYSTEM Upgrade	4,800	16,400
OR -3103- -	Corrective Activities - Defense	4,383	0
OR -3104- -	Corrective Activities - NonDefense	1,100	0
	Subtotal: OR, OAK RIDGE NATIONAL LABORATORY, CA	11,662	16,400
FIELD OFFICE: OR, INSTALLATION: OAK RIDGE NATIONAL LABORATORY, CATEGORY: ER			
OR -3301- -	ORNL WAG 1 Environmental Restoration	8,801	3,565
OR -3302- -	ORNL WAG 2 Environmental Restoration	5,275	6,472
OR -3303- -	ORNL WAG 3 Environmental Restoration	0	0
OR -3304- -	ORNL WAG 4 Environmental Restoration	0	0
OR -3305- -	ORNL WAG 5 Environmental Restoration	8,991	1,905
OR -3306- -	ORNL WAG 6 Environmental Restoration	17,375	38,926
OR -3307- -	ORNL WAG 7 Environmental Restoration	0	500
OR -3308- -	ORNL WAG 8 Environmental Restoration	114	0
OR -3309- -	ORNL WAG 9 Environmental Restoration	0	0

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ADS Number	Title	FY92	FY93
OR -3310- -	ORNL WAG 10 Environmental Restoration	2,811	3,704
OR -3311- -	ORNL WAG 11 Environmental Restoration	55	700
OR -3312- -	ORNL WAG 13 Environmental Restoration	397	563
OR -3313- -	ORNL Inactive Liquid Low-Level Waste Tanks System	3,217	3,406
OR -3314- -	Surveillance and Maintenance	9,997	5,000
OR -3501- -	ORNL Program Management	1,974	8,263
OR -3701- -	ORNL Facilities Decontamination and Decommissioning	2,313	4,963
OR -9301- -	White Oak Creek Embayment	639	0
	Subtotal: OR, OAK RIDGE NATIONAL LABORATORY, ER	61,959	77,967
FIELD OFFICE: OR, INSTALLATION: OAK RIDGE NATIONAL LABORATORY, CATEGORY: FT			
OR -6500-OR-	Oak Ridge Facility Transition	0	0
OR -6501-CR-	Center for Energy & Environmental Research (ER)	0	0
OR -6502-OR-	Oak Ridge National Laboratory (NE)	0	0
OR -6504-IS-	ORNL Isotopes Facilities Shutdown Program (ER)	0	0
	Subtotal: OR, OAK RIDGE NATIONAL LABORATORY, FT	0	0
FIELD OFFICE: OR, INSTALLATION: OAK RIDGE NATIONAL LABORATORY, CATEGORY: WM			
OR -3201- -	Facility Operations and Maintenance - Defense	10,551	19,958
OR -3202- -	NFS Storage Project	1,100	0
OR -3203- -	Site Wide Activities - Defemse	5,608	5,020
OR -3204- -	General Plant Projects - Defense	9,188	10,930
OR -3205- -	Process Waste Treatment Plant	0	200
OR -3206- -	FFA LLLW Tank Compliance	1,650	11,650
OR -3207- -	New Facility Planning - Defense	2,550	3,800
OR -3251- -	Facility Operations & Maintenance - Nondefense	7,721	11,800
OR -3252- -	Site-Wide Activities - Nondefense	2,826	2,324
OR -3253- -	General Plant Projects, WM, Nondefense	5,050	8,676
OR -3401- -	Landlord Operations	4,500	12,900
OR -3402- -	Sanitary Waste System Upgrade	0	2,200
	Subtotal: OR, OAK RIDGE NATIONAL LABORATORY, WM	50,744	89,458
	Subtotal: OR, OAK RIDGE NATIONAL LABORATORY	124,365	183,825
FIELD OFFICE: OR, INSTALLATION: OR ASSOC. UNIVERS., CATEGORY: ER			
OR -1312-AA-	Environmental Survey and Site Assessment Program -- FUSRAP	782	700
OR -8390- -	ORAU Remedial Investigation and Remedial Action	35	1,863
	Subtotal: OR, OR ASSOC. UNIVERS., ER	817	2,563
	Subtotal: OR, OR ASSOC. UNIVERS.	817	2,563

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ADS Number	Title	FY92	FY93
FIELD OFFICE: OR, INSTALLATION: ORO - DIRECT, CATEGORY: ER			
OR -8301- -	DOE Direct	20,756	12,482
OR -8302- -	Agreements-In-Principle (AIP)	5,700	6,585
OR -8351- -	ER Waste Management	2,628	1,765
	Subtotal: OR, ORO - DIRECT, ER	29,084	20,832
FIELD OFFICE: OR, INSTALLATION: ORO - DIRECT, CATEGORY: WM			
OR -3031- 1-	Program Support	1,974	2,450
OR -8202- -	Program Control	3,306	4,300
	Subtotal: OR, ORO - DIRECT, WM	5,280	6,750
	Subtotal: OR, ORO - DIRECT	34,364	27,582
FIELD OFFICE: OR, INSTALLATION: PADUCAH GASEOUS DIFFUSION PLANT, CATEGORY: ER			
OR -5301- -	Support Facilities	1,213	3,070
OR -5302- -	Off-Site Groundwater Contamination	4,619	7,225
OR -5303- -	WAGs 5 & 11	2,154	750
OR -5304- -	WAGs 1 & 7	196	2,600
OR -5305- -	WAG 13	196	1,538
OR -5306- -	WAGs 8 & 9	68	258
OR -5307- -	WAGs 12 & 15	0	162
OR -5308- -	WAGs 10 & 16	0	162
OR -5309- -	WAG 17	0	100
OR -5310- -	WAG 18	0	50
OR -5311- -	Groundwater Program	653	2,124
OR -5312- -	Underground Storage Tanks	0	900
OR -5313- -	WAGs 2,3, & 14	196	2,205
OR -5501- -	Program Management	0	3,146
OR -5701- -	Facility Decontamination and Decommissioning	101	2,700
	Subtotal: OR, PADUCAH GASEOUS DIFFUSION PLANT, ER	9,396	26,990
	Subtotal: OR, PADUCAH GASEOUS DIFFUSION PLANT	9,396	26,990
FIELD OFFICE: OR, INSTALLATION: PORTSMOUTH GASEOUS DIFFUSION PLANT, CATEGORY: ER			
OR -6301-AA-	Quadrant I RFI/CMS/CMI	3,123	811
OR -6302-AA-	Quadrant II RFI/CMS/CMI	3,123	740
OR -6303-AA-	Quadrant III RFI/CMS/CMI	2,068	264
OR -6304-AA-	Quadrant IV RFI/CMS/CMI	329	2,263
OR -6305-AA-	Closures	10,347	8,402
OR -6306-AA-	Ground Water Protection Program	210	819
OR -6307-AA-	Underground Storage Tanks/Aboveground Storage Tanks	0	0

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ADS Number	Title	FY92	FY93
OR -6308-AA-	Other Consent Decree	3,450	1,505
OR -6309-AA-	RCRA Closures	3,100	8,250
OR -6501-AA-	Program Management	0	2,004
OR -6701-AA-	GCEP Termination, Surveillance and Maintenance	2,138	2,360
OR -6702-AA-	Surplus Facilities Demolition	0	0
OR -6801-AA-	Surveillance & Monitoring	0	615
	Subtotal: OR, PORTSMOUTH GASEOUS DIFFUSION PLANT, ER	27,888	28,033
	Subtotal: OR, PORTSMOUTH GASEOUS DIFFUSION PLANT	27,888	28,033
FIELD OFFICE: OR, INSTALLATION: WELDON SPRING SITE REMEDIAL ACTIONS, CATEGORY: ER			
OR -7301- -	Project Integration	12,199	17,951
OR -7302- -	Support Facilities	6,094	5,836
OR -7303- -	Quarry	9,496	9,022
OR -7304- -	Raffinate Pits	24	319
OR -7305- -	Chemical Plant	6,102	10,401
OR -7306- -	Vicinity Properties	0	0
OR -7307- -	Disposal Facility	4,115	1,304
OR -7308- -	Studies	6,070	6,130
OR -7312- -	Environmental Survey and Site Assessment Program-WSSRAP	112	150
	Subtotal: OR, WELDON SPRING SITE REMEDIAL ACTIONS, ER	44,212	51,113
	Subtotal: OR, WELDON SPRING SITE REMEDIAL ACTIONS	44,212	51,113
FIELD OFFICE: OR, INSTALLATION: Y-12, CATEGORY: CA			
OR -2101- -	Steam Plant Ash Disposal Faciltiy Line Item Project	8,122	0
OR -2102- -	Corrective Activities	3,295	600
OR -2103- -	General Plant Projects, Corrective Activities	4,360	430
	Subtotal: OR, Y-12, CA	15,777	1,030
FIELD OFFICE: OR, INSTALLATION: Y-12, CATEGORY: ER			
OR -2301- -	Chestnut Ridge	109	1,637
OR -2302- -	Bear Creek Valley	118	1,101
OR -2303- -	Upper East Fork Poplar Creek (UEFPC)	1,907	13,746
OR -2304- -	CAPCA Phase I	9,570	16,000
OR -2305- -	CAPCA Phase II	1,542	500
OR -2306- -	Surveillance and Maintenance	0	3,125
OR -2501- -	Program Management	0	4,936
OR -2701- -	Y-12 Plant Facilities D&D	1,146	10,320
OR -9304- -	East Fork Poplar Creek (EFPC)	2,954	7,485
	Subtotal: OR, Y-12, ER	17,346	58,850

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ADS Number	Title	FY92	FY93
FIELD OFFICE: OR, INSTALLATION: Y-12, CATEGORY: FT			
OR -6503-Y1-	Oak Ridge Y-12 Facilities Transition	0	2,000
	Subtotal: OR, Y-12, FT	0	2,000
FIELD OFFICE: OR, INSTALLATION: Y-12, CATEGORY: WM			
OR -2201- -	Facility Operations & Maintenance	33,744	26,231
OR -2202- -	Site-Wide Activities	7,706	15,063
OR -2203- -	Prod Waste Storage Faciltiy (PWSF)	9,238	4,200
OR -2204- -	Industrial Waste Compaction Facility (IWCF)	300	2,200
OR -2205- -	Plant Drains Wastewater Treatment Upgrades	0	1,800
OR -2206- -	General Plant Project WM-DP	7,817	8,760
OR -2207- -	New Facilities	0	2,780
	Subtotal: OR, Y-12, WM	58,805	61,034
	Subtotal: OR, Y-12	91,928	122,914
	Subtotal: OR	518,095	685,868
FIELD OFFICE: RF, INSTALLATION: ROCKY FLATS PLANT, CATEGORY: CA			
RF -3824- -	Corrective Activities	9,251	0
	Subtotal: RF, ROCKY FLATS PLANT, CA	9,251	0
FIELD OFFICE: RF, INSTALLATION: ROCKY FLATS PLANT, CATEGORY: ER			
RF -1001- -	OU 1 - 881 HILLSIDE	11,630	1,769
RF -1002- -	OU 2 - 903 PAD, MOUND, AND EAST Trenches	8,267	8,416
RF -1005- -	OU 5 - WOMAN CREEK	3,187	5,106
RF -1006- -	OU 8 - 700 Area	517	51
RF -1007- -	OU 12 - 400/800 Area	321	16
RF -1008- -	OU 13 - 100 Area	227	19
RF -1009- -	OU 16 - Low-Priority Sites	183	0
RF -1010- -	OU 14 - Radioactive Sites	371	67
RF -1011- -	OU 3 - Offsite Areas	2,708	2,707
RF -1012- -	Sitewide Programs	5,773	15,388
RF -1014- -	OU 6 - WALNUT CREEK	3,159	9,500
RF -1018- -	OU 15 - Inside Building Closures	540	54
RF -1231- -	OU 10 - Other Outside Closures	192	0
RF -1233- -	Program Management Support - ER	6,027	7,314
RF -1251- -	OU 9 - Original Process Waste Lines (OPWL)	845	2,739
RF -1255- -	OU 7 - Present Landfill	0	7,977
RF -1258- -	OU 4 - Solar Ponds	25,882	42,177
RF -1261- -	OU 11 - WEST SPRAY FIELD	171	2,032

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ADS Number	Title	FY92	FY93
RF -1263- -	OXNARD Facility	0	0
RF -1264- -	Onsite/Offsite Water Management	0	53,924
RF -1271- -	Decontamination Facilities - ER	0	1,864
RF -1272- -	Waste Handling/Treatment Facilities - ER	0	0
RF -6003- -	Program Management - D&D	0	0
	Subtotal: RF, ROCKY FLATS PLANT, ER	70,000	161,120
FIELD OFFICE: RF, INSTALLATION: ROCKY FLATS PLANT, CATEGORY: FT			
RF -6700-RF-	Rocky Flats Facilities Transition	0	4,461
	Subtotal: RF, ROCKY FLATS PLANT, FT	0	4,461
FIELD OFFICE: RF, INSTALLATION: ROCKY FLATS PLANT, CATEGORY: WM			
RF -3031-1 -	Program Direction	1,798	1,344
RF -3812- -	Program Control	33,786	45,194
RF -3813- -	Waste Minimization, Program Administration	875	1,522
RF -3814- -	Agreement in Principle (COLORADO)	0	2,340
RF -3815- -	Payment to Local Communities	800	0
RF -3821- -	Facility Operations & Maintenance	50,211	57,964
RF -3822- -	New Facilities Planning	1,002	3,629
RF -3823- -	General Plant Projects - Waste Management	0	462
RF -3826- -	Capital Projects	0	927
RF -3827- -	Sewage Treatment Plant	7,419	200
RF -3828- -	New Sanitary Landfill	1,182	1,000
RF -3829- -	Building 374, Liquid Waste Treatment Facility Upgrade	559	3,134
	Subtotal: RF, ROCKY FLATS PLANT, WM	97,632	117,716
	Subtotal: RF, ROCKY FLATS PLANT	176,883	283,297
	Subtotal: RF	176,883	283,297
FIELD OFFICE: RL, INSTALLATION: BATTELLE MEMORIAL INSTITUTE, CATEGORY: CA			
RL -8430-0 -	Science & Technology Research (non-def)	3,045	50
	Subtotal: RL, BATTELLE MEMORIAL INSTITUTE, CA	3,045	50
FIELD OFFICE: RL, INSTALLATION: BATTELLE MEMORIAL INSTITUTE, CATEGORY: WM			
RL -8410-0 -	Hanford WM Science and Technology and Compliance Operation (PNL)	0	11,125
RL -8410-2 -	329 Building Compliance PNL	3,200	2,489
RL -8410-3 -	Hazardous Waste Treatment Facility (PNL)	3,030	700
	Subtotal: RL, BATTELLE MEMORIAL INSTITUTE, WM	6,230	14,314

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Activity Data Sheet
Sorted by Field Office, Installation, and Category
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ADS Number	Title	FY92	FY93
	Subtotal: RL, BATTELLE MEMORIAL INSTITUTE	9,275	14,364
FIELD OFFICE: RL, INSTALLATION: HANFORD, CATEGORY: CA			
RL -1140-0 -	Corrective Activities - WT Safety and Operations	1,675	2,405
RL -2240-0 -	Corrective Activities - Solid Waste	1,940	0
RL -7350-0 -	Corrective Activities - Environmental Surv. & Monitoring	7,167	0
RL -8420-0 -	Corrective Activities - Science & Technology Research (Defense)	150	0
	Subtotal: RL, HANFORD, CA	10,932	2,405
FIELD OFFICE: RL, INSTALLATION: HANFORD, CATEGORY: ER			
RL -3010-0 -	RARA/USTs	6,382	8,500
RL -3020-0 -	RCRA Closures	9,980	3,700
RL -3400-0 -	Program Management Support Remedial Actions	46,056	47,088
RL -3410-0 -	Program Management Support Decont & Decomm	1,900	1,900
RL -3500-0 -	Asbestos Abatement	0	2,700
RL -3700-0 -	Disposal Facility	0	0
RL -8415-0 -	Science, Tech & Fac Mgmy (Non-Defense)	6,210	1,100
	Subtotal: RL, HANFORD, ER	70,528	64,988
FIELD OFFICE: RL, INSTALLATION: HANFORD, CATEGORY: FT			
RL -6601-RL-	Richland Facilities Transition	0	2,000
	Subtotal: RL, HANFORD, FT	0	2,000
FIELD OFFICE: RL, INSTALLATION: HANFORD, CATEGORY: WM			
RL - 103-0 -	DOE-RL Field Support - WM	7,872	21,235
RL - 104-0 -	DOE-RL Public Support - LL	0	11,800
RL -1100-0 -	Tank Farms Operations and Maintenance	86,057	107,844
RL -1110-0 -	Waste Tank Safety Programs	23,454	48,271
RL -1120-0 -	Tank Farm Upgrades	6,392	20,755
RL -1120-1 -	Tank Farms Radiological Support Facility (W-188)	100	0
RL -1120-2 -	Tank Farm Ventilation Upgrades (W-030)	5,091	7,750
RL -1120-4 -	Replacement of the Cross Site Transfer System (W-058)	0	4,995
RL -1120-5 -	New DST Tank Farm (95 LI) (W-260)	0	300
RL -1130-0 -	Waste Characterization	7,784	38,092
RL -1200-0 -	Program Management and Administration	5,000	17,754
RL -1210-0 -	Waste Retrieval	4,690	14,491
RL -1210-1 -	Dst Storage Aging Waste Transfer Lines	6,265	258
RL -1210-2 -	101-AZ Retrieval System Projects (W-151)	7,485	4,485
RL -1220-0 -	Pretreatment	9,090	14,720
RL -1230-0 -	Grout Disposal Program	36,999	32,555
RL -1240-1 -	Vitrification	100,200	124,815
RL -1260-0 -	Facility Operations	36,300	38,976

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Activity Data Sheet
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ADS Number	Title	FY92	FY93
RL -1260-1 -	B Plant Canron Trane	6,156	2,969
RL -1260-2 -	Safety Class Ventilation	4,404	297
RL -1260-3 -	Waste Remediation Facility Improvements	132	198
RL -1260-4 -	Office Facilities - 200 EAST	0	88
RL -1270-0 -	Multi-Puppose Storage Complex	0	5,344
RL -1280-0 -	Matte Function Waste Remediation Facility	3,420	26,821
RL -2200-0 -	Solid Waste Storage and Disposal	7,735	25,749
RL -2200-1 -	Project W-112, Enhanced RMW Storage	1,060	1,700
RL -2200-2 -	Project W-113, CH-TRU Retrieval	951	1,900
RL -2220-1 -	Waste Receiving and Process (WRAP) Module 1	14,200	26,800
RL -2230-1 -	WRAP Module 2A	4,800	3,100
RL -2300-0 -	Liquid Effluents	7,400	20,090
RL -2310-1 -	Hanford Environmental Compliance (HEC)	31,600	53,239
RL -2320-0 -	Waste and Decontamination Services	20,500	28,922
RL -4100-0 -	Program and Environmental Management	20,664	18,300
RL -4100-1 -	DOE-Order Compliance	1,426	1,800
RL -4110-0 -	K Basin Operations Program	30,610	33,000
RL -4120-0 -	N Reactor Program	18,390	0
RL -4130-0 -	PUREX/UO3 Operations	51,137	44,900
RL -4150-0 -	300 Area Fuel Supply Program	1,920	7,043
RL -4170-0 -	PFP	60,158	89,000
RL -4200-0 -	FFTF Plant	79,000	45,000
RL -4210-0 -	Program and Environmental Management	1,124	4,536
RL -7100-0 -	Laboratory Operations and Upgrades	21,555	31,043
RL -7100-1 -	222-S LAB HVAC/Elect Upgrade (W-001)	1,341	200
RL -7100-2 -	Radioactive Waste Lines (W-087)	20	595
RL -7200-0 -	General Admin Support/Buildings	23,046	32,558
RL -7200-1 -	93-R-003, 200 Area Unsecured Core Area FAB Shop	0	1,058
RL -7200-4 -	95-L-XXX, Office/Training Facility	2	89
RL -7205-1 -	92-L-017, 200 East Steam System Rehab, PH II	491	47
RL -7205-2 -	90-B-503, Decon Laundry Facility	3,852	7,489
RL -7205-3 -	90-L-035, Landlord Program Safety Compliance - Phase I	8,996	4,847
RL -7205-4 -	94-L-070, 300 Area Process Sewer Piping System Upgrade	375	89
RL -7210-1 -	92-L-044, Hanford Infrastructure, Underground Storage Tanks	329	3,747
RL -7210-2 -	92-L-019, Road,Ground,and Lighting Safety Improvements, 300/1100A	823	6,547
RL -7210-3 -	93-L-073, Landlord Program Safety Compliance - Phase II	79	965
RL -7210-4 -	95-L-011, Railroad Maintenance Facility	229	89
RL -7210-5 -	95-L-102, Primary Highway Route - North of Wye Barricade	223	326
RL -7220-1 -	91-B-524, 300 Area Elec Dist Conversion & Safty Improv, Phase I	4,446	1,028
RL -7220-2 -	92-L-047,300 Area Elect Dist Conversion & Safety Improv, Phase II	1,121	1,771
RL -7225-2 -	94-D-391, 325 Facility Compliance/Renovation	0	1,500
RL -7250-0 -	Plans & Budgets - Integration Planning	2,197	5,552
RL -7260-0 -	Site Support - Waste Operations	7,349	4,265
RL -7300-0 -	Environmental Support - YAKIMA INDIAN NATION	775	800
RL -7310-0 -	Environmental Support - NEZ PERCE INDIAN NATION	80	400
RL -7320-0 -	Environmental Support - UMATILLA INDIAN NATION	280	600
RL -7325-0 -	State of Oregon Hanford Oversight	0	200
RL -7330-0 -	Environmental Support - Planning & TPA Mgmt	6,164	6,646
RL -7335-0 -	TRI-PARTY Agreement State Funding	1,464	4,550
RL -7340-0 -	WHC Environmental Surveillance & Monitoring	18,400	25,028

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ADS Number	Title	FY92	FY93
RL -7340-1 -	Envir Monitoring-RCRA GW Mon Well Installation	0	9,700
RL -7360-0 -	Environ Support - Inventories Management	2,290	1,422
RL -7370-0 -	Environ Support - Misc Activities	1,388	1,550
RL -8400-0 -	Hanford WM Science and Tech and Compl Ops (Defense)	15,893	15,659
RL -8410-1 -	Building Utilities-Phase I-Facility Compl/Ren	32	0
	Subtotal: RL, HANFORD, WM	832,806	1,120,252
	Subtotal: RL, HANFORD	914,266	1,189,645
FIELD OFFICE: RL, INSTALLATION: HANFORD-100, CATEGORY: ER			
RL -3100-0 -	100 DR Char., Assess. and Remedial Action	5,175	3,527
RL -3105-0 -	100 BC Char., Assess. and Remedial Action	3,004	8,133
RL -3110-0 -	100 KR Char., Assess. and Remedial Action	379	8,970
RL -3115-0 -	100 FR Char., Assess. and Remedial Action	386	8,056
RL -3120-0 -	100 HR Char., Assess. and Remedial Action	16,465	13,972
RL -3125-0 -	100 NR Char., Assess. and Remedial Action	921	9,772
RL -3510-0 -	100 Area D&D	2,552	2,700
RL -3600-0 -	N Reactor	0	20,557
	Subtotal: RL, HANFORD-100, ER	28,882	75,687
	Subtotal: RL, HANFORD-100	28,882	75,687
FIELD OFFICE: RL, INSTALLATION: HANFORD-1100, CATEGORY: ER			
RL -3390-0 -	1100 EM Char., Assess. and Remedial Action	3,500	2,070
	Subtotal: RL, HANFORD-1100, ER	3,500	2,070
	Subtotal: RL, HANFORD-1100	3,500	2,070
FIELD OFFICE: RL, INSTALLATION: HANFORD-200, CATEGORY: ER			
RL -3000-0 -	SST Closures	16,530	1,200
RL -3200-0 -	200 BP Char., Assess. and Remedial Action	14,875	8,819
RL -3205-0 -	200 NO Characterization and Assessment	0	0
RL -3210-0 -	200 PO Characterization and Assessment	0	0
RL -3215-0 -	200 RO Characterization and Assessment	0	0
RL -3220-0 -	200 SO Characterization and Assessment	0	0
RL -3225-0 -	200 TP Characterization and Assessment	0	0
RL -3230-0 -	200 UP Characterization and Assessment	100	233
RL -3235-0 -	200 ZP Char., Assess. and Remedial Action	3,628	2,873
RL -3240-0 -	200 IU Characterization and Assessment	0	0
RL -3245-0 -	200 SS Characterization and Assessment	0	0
RL -3250-0 -	200 EGW Char., Assess. and Remedial Action	0	0

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ADS Number	Title	FY92	FY93
RL -3255-0 -	200 WGW Characterization and Assessment	0	0
RL -3520-0 -	200 Area D&D	7,038	7,400
	Subtotal: RL, HANFORD-200, ER	42,171	20,525
	Subtotal: RL, HANFORD-200	42,171	20,525
FIELD OFFICE: RL, INSTALLATION: HANFORD-300, CATEGORY: ER			
RL -3300-0 -	300 FF Char., Assess. and Remedial Action	16,329	23,475
RL -3530-0 -	300 Area	0	0
	Subtotal: RL, HANFORD-300, ER	16,329	23,475
	Subtotal: RL, HANFORD-300	16,329	23,475
FIELD OFFICE: RL, INSTALLATION: RICHLAND FIELD OFFICE, CATEGORY: WM			
RL -3031-1 -	Program Direction	33,492	40,974
	Subtotal: RL, RICHLAND FIELD OFFICE, WM	33,492	40,974
	Subtotal: RL, RICHLAND FIELD OFFICE	33,492	40,974
	Subtotal: RL	1,047,915	1,366,740
FIELD OFFICE: SF, INSTALLATION: CANOGA PARK, CA, CATEGORY: FT			
SF -6803-KM-	San Francisco Facilities Transition - KMS Fusion	0	0
	Subtotal: SF, CANOGA PARK, CA, FT	0	0
	Subtotal: SF, CANOGA PARK, CA	0	0
FIELD OFFICE: SF, INSTALLATION: ETEC FIELD LAB, CATEGORY: ER			
SF -1488-10-	Area IV - Remedial Action	1,376	77
SF -1488-20-	ETEC D & D	10,791	4,883
SF -1488-30-	Program Mgmt - Support/ETEC	623	747
	Subtotal: SF, ETEC FIELD LAB, ER	12,790	5,707
FIELD OFFICE: SF, INSTALLATION: ETEC FIELD LAB, CATEGORY: FT			
SF -6802-ET-	San Francisco Facilities Transition - ETEC (NE)	0	0

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ADS Number	Title	FY92	FY93
	Subtotal: SF, ETEC FIELD LAB, FT	0	0
FIELD OFFICE: SF, INSTALLATION: ETEC FIELD LAB, CATEGORY: WM			
SF -3921- -	Facility Operations and Maintenance	781	571
SF -4017- -	Tiger Team Response	0	200
	Subtotal: SF, ETEC FIELD LAB, WM	781	771
	Subtotal: SF, ETEC FIELD LAB	13,571	6,478
FIELD OFFICE: SF, INSTALLATION: GENERAL ATOMICS, CATEGORY: ER			
SF -1484-02-	Hot Cell/Fuel Dev Lab D&D Project	1,158	3,058
SF -1484-03-	Hot Cell/FDL Program Mgmt	133	410
	Subtotal: SF, GENERAL ATOMICS, ER	1,291	3,468
	Subtotal: SF, GENERAL ATOMICS	1,291	3,468
FIELD OFFICE: SF, INSTALLATION: GENERAL ELECTRIC, CATEGORY: ER			
SF -1486-02-	Hot Cell/Glove Box Decontamination and Waste Disposal Project	403	4,137
SF -1486-03-	GE Program Management	133	410
	Subtotal: SF, GENERAL ELECTRIC, ER	536	4,547
	Subtotal: SF, GENERAL ELECTRIC	536	4,547
FIELD OFFICE: SF, INSTALLATION: LAWRENCE BERKELEY LAB, CATEGORY: CA			
SF -2002- -	Air Toxic Facility Assessment	3,975	0
SF -2006- -	Sanitary Sewer Monitoring System	105	0
SF -2011- -	Replace, Monitor, or Remove UG Tanks - Phase II	100	0
SF -4007-AA-	Corrective Actions at Permeated Facilities	25	0
	Subtotal: SF, LAWRENCE BERKELEY LAB, CA	4,205	0
FIELD OFFICE: SF, INSTALLATION: LAWRENCE BERKELEY LAB, CATEGORY: ER			
SF -1482-11-	Soil and Groundwater - Environmental Assessment & Remediation	751	1,852
SF -1482-12-	Closure Hazardous Waste Handling Facility	0	0
SF -1482-31-	Program Management	752	848
	Subtotal: SF, LAWRENCE BERKELEY LAB, ER	1,503	2,700

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ADS Number	Title	FY92	FY93
FIELD OFFICE: SF, INSTALLATION: LAWRENCE BERKELEY LAB, CATEGORY: FT			
SF -6801-BV-	San Francisco Facilities Transition - BEVALAC (ER)	0	1,400
	Subtotal: SF, LAWRENCE BERKELEY LAB, FT	0	1,400
FIELD OFFICE: SF, INSTALLATION: LAWRENCE BERKELEY LAB, CATEGORY: WM			
SF -3914- -	Waste Minimization Management	0	300
SF -3931- -	Facility Operations & Maintenance (Waste Management)	6,585	5,883
SF -3933- -	LBL Waste Storage - GPP	0	500
SF -3934- -	Hazardous Waste Handling Facility	1,582	0
	Subtotal: SF, LAWRENCE BERKELEY LAB, WM	8,167	6,683
	Subtotal: SF, LAWRENCE BERKELEY LAB	13,875	10,783
FIELD OFFICE: SF, INSTALLATION: LAWRENCE LIVERMORE NATIONAL LAB, CATEGORY: CA			
SF -1000- -	Maintenance of Compliances thru Sewer Effluent Alarms	1,540	0
SF -1002- -	Compliance Stack Monitoring	4,965	0
SF -1004- -	Permit/Relocate High Explosive Burn Facility	100	0
SF -3945- -	Sewer Pipe Rehabilitation	5,350	5,500
SF -3946- -	Tank Upgrades Project	4,000	10,200
	Subtotal: SF, LAWRENCE LIVERMORE NATIONAL LAB, CA	15,955	15,700
FIELD OFFICE: SF, INSTALLATION: LAWRENCE LIVERMORE NATIONAL LAB, CATEGORY: ER			
SF -1481-01-	Main Site - RA	12,010	13,495
SF -1481-02-	Main Site - RCRA	652	711
SF -1481-03-	Site 300 RI	4,586	1,672
SF -1481-04-	Site 300 RCRA	2,566	491
SF -1481-05-	OU#1/GSA	0	2,281
SF -1481-06-	OU#2 /Building 834/	0	961
SF -1481-07-	OU#3/Pit 6/Landfill Area	0	891
SF -1481-08-	OU#4 /HE Process Area/	0	929
SF -1481-09-	OU#5 Firing Areas	0	737
SF -1481-10-	OU#6 Bldg. 833, Pits 8 and 9 and Misc.	0	702
SF -1481-30-	Program Management	4,577	5,565
	Subtotal: SF, LAWRENCE LIVERMORE NATIONAL LAB, ER	24,391	28,435
FIELD OFFICE: SF, INSTALLATION: LAWRENCE LIVERMORE NATIONAL LAB, CATEGORY: WM			
SF -3913- -	Waste Minimization - Planning	1,500	1,640
SF -3941- -	Facility Operations & Maintenance	16,314	33,765
SF -3943- -	Hazardous Waste Management General Plant Project	275	3,196
SF -3944- -	Decontamination and Waste Treatment Facility	3,000	2,755

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ADS Number	Title	FY92	FY93
	Subtotal: SF, LAWRENCE LIVERMORE NATIONAL LAB, WM	21,089	41,356
	Subtotal: SF, LAWRENCE LIVERMORE NATIONAL LAB	61,435	85,491
FIELD OFFICE: SF, INSTALLATION: SAN FRANCISCO OPERATIONS OFFICE, CATEGORY: ER			
SF -1487-02-	Contractor Support - Environmental Restoration	1,779	0
	Subtotal: SF, SAN FRANCISCO OPERATIONS OFFICE, ER	1,779	0
FIELD OFFICE: SF, INSTALLATION: SAN FRANCISCO OPERATIONS OFFICE, CATEGORY: WM			
SF -3031-1 -	Program Direction	1,980	2,298
SF -3912-SF-	Program Control - Contractor Support	2,490	1,033
SF -3915-SF-	Agreement in Principle	1,500	2,000
	Subtotal: SF, SAN FRANCISCO OPERATIONS OFFICE, WM	5,970	5,331
	Subtotal: SF, SAN FRANCISCO OPERATIONS OFFICE	7,749	5,331
FIELD OFFICE: SF, INSTALLATION: STANFORD LINEAR ACCELERATOR CENTER, CATEGORY: ER			
SF -1483-10-SG	Soil and Groundwater Characterization and Remediation	311	0
SF -1483-30-PM	Program Management Environmental Restoration	269	94
	Subtotal: SF, STANFORD LINEAR ACCELERATOR CENTER, ER	580	94
FIELD OFFICE: SF, INSTALLATION: STANFORD LINEAR ACCELERATOR CENTER, CATEGORY: WM			
SF -3914-B -	Waste Minimization Management (SLAC)	84	284
SF -3951-WM-	SLAC Wastem Management Facilites Ops&Mainenance	914	2,248
	Subtotal: SF, STANFORD LINEAR ACCELERATOR CENTER, WM	998	2,532
	Subtotal: SF, STANFORD LINEAR ACCELERATOR CENTER	1,578	2,626
FIELD OFFICE: SF, INSTALLATION: UNIVERSITY OF CALIFORNIA AT DAVIS, CATEGORY: ER			
SF -1485-01-SG	Soil & Groundwater-LEHR	940	888
SF -1485-02-DD	D&D	3,789	1,936
SF -1485-03-PM	Program Management	1,161	814
	Subtotal: SF, UNIVERSITY OF CALIFORNIA AT DAVIS, ER	5,890	3,638
	Subtotal: SF, UNIVERSITY OF CALIFORNIA AT DAVIS	5,890	3,638

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ADS Number	Title	FY92	FY93
	Subtotal: SF	105,925	122,362
FIELD OFFICE: SR, INSTALLATION: SAVANNAH RIVER FIELD OFFICE, CATEGORY: WM			
SR - 12-AA-	Program Control	14,595	15,038
SR -3031-1 -	DOE - Program Control	4,104	5,663
	Subtotal: SR, SAVANNAH RIVER FIELD OFFICE, WM	18,699	20,701
	Subtotal: SR, SAVANNAH RIVER FIELD OFFICE	18,699	20,701
FIELD OFFICE: SR, INSTALLATION: SAVANNAH RIVER SITE, CATEGORY: ER			
SR - 408-D -	Waste Transfer	10,200	0
SR - 478-A -	State Reimbursement for Federal Facility Agreement (FFA)	1,800	1,500
SR - 479-A -	DOE-ER Program Management Support	2,160	3,030
SR - 480-A -	Agency for Toxic Substance and Disease Registry (ATSDR)	0	1,700
SR - 481-A -	Agreement in Principle (AIP)	0	0
SR - 501-AA-	SRL & TNX Basins	1,145	5,293
SR - 502-AA-	Coal Pile Runoff & Ash Basins	266	388
SR - 503-AA-	Acid/Caustic Basins	150	1,564
SR - 504-AA-	Oil & Chemical Basins	713	2,792
SR - 505-AA-	Reactor Basins	432	477
SR - 506-AA-	Separations Basins	269	1,050
SR - 507-AA-	Basin Sewer Lines	52	1,266
SR - 508-AA-	Burning Pits	1,180	2,398
SR - 509-AA-	Rubble Pits & Piles	1,017	2,040
SR - 510-AA-	Radioactive Burial Grounds	3,128	5,251
SR - 511-AA-	Non Radioactive Burial Grounds	0	2,040
SR - 512-AA-	Storage Tanks	1,023	1,830
SR - 513-AA-	Minimal Action Units	474	791
SR - 514-AA-	Reactor Areas Groundwater	0	0
SR - 515-AA-	200 Area Groundwater	5,775	9,391
SR - 516-AA-	3/700 Area Groundwater	5,544	7,737
SR - 517-AA-	400 Area Groundwater	0	1,114
SR - 518-AA-	600 Area Groundwater	1,636	1,796
SR - 601-AA-	R Reactor D&D	0	0
SR - 602-AA-	232-F Tritium D&D	0	0
SR - 603-AA-	235-F PuFF D&D	0	0
SR - 604-AA-	284-F Power House D&D	0	0
SR - 605-AA-	T16H HLW Tank D&D	0	0
SR - 606-AA-	SED I & SED II D&D	1,144	729
SR - 607-AA-	412-D Heavy Water Facility D&D	0	0
SR - 608-AA-	HWCTR D&D	225	250
SR - 609-AA-	Ford Building D&D	0	0
SR - 610-AA-	D&D Program Development	1,104	1,176
SR - 701-AA-	Post Closure Management	729	1,880
SR - 801-AA-	ER Program Support	9,568	8,309

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ADS Number	Title	FY92	FY93
	Subtotal: SR, SAVANNAH RIVER SITE, ER	49,734	65,792
FIELD OFFICE: SR, INSTALLATION: SAVANNAH RIVER SITE, CATEGORY: FT			
SR -6900-SR-	Savannah River Facilities Transition	0	2,000
	Subtotal: SR, SAVANNAH RIVER SITE, FT	0	2,000
FIELD OFFICE: SR, INSTALLATION: SAVANNAH RIVER SITE, CATEGORY: WM			
SR - 13-AA-	Waste Minimization	1,010	1,167
SR - 14-AA-	Defense Programs	0	1,938
SR - 21-AA-	Program Management (DWPF and Area Support Use Only)	3,459	7,520
SR - 22-AA-	Vitrification	134,285	169,707
SR - 23-AA-	Saltstone Z-Area	8,215	11,096
SR - 24-GP-	General Plant Projects-Defense Waste Processing Facility	1,880	5,950
SR - 25-LI-	New Facility Planning-Defense Waste Processing Facility	220	0
SR - 26-LI-	DWPF Line Item 81-T-105	40,000	32,600
SR - 31-AA-	Liquid Waste Management	18,359	26,049
SR - 32-AA-	H-Tank Farm	53,830	60,309
SR - 33-AA-	F-Tank Farm	28,767	38,768
SR - 34-AA-	ITP/ESP	31,632	55,907
SR - 35-AA-	Effluent Treatment Facility	21,688	20,712
SR - 36-AA-	Liquid Effluent Treatment Facility (LETF)	0	7,697
SR - 37-GP-	Gemeral Plant Projecte-Liquid Waste	4,477	2,589
SR - 38-LI-	New Facility Planning-Liquid Waste	1,306	68
SR - 39-LI-	New Waste Transfer Facility	15,788	7,376
SR - 41-AA-	Solid Waste Management	0	4,583
SR - 42-AA-	Solid Waste Storage and Disposal	21,282	28,969
SR - 43-GP-	General Plant Projects-Solid Waste	778	1,356
SR - 44-LI-	New Facility Planning-Solid Waste	232	967
SR - 45-LI-	Consolidated Incineration Facility	9,100	14,414
SR - 46-LI-	Burial Ground Expansion	13,098	9,796
SR - 47-LI-	M-Area Waste Disposal	4,170	91
SR - 48-LI-	Hazardous Waste/Mixed Waste Disposal Facility	4,330	9,001
SR - 49-LI-	Transuranic Waste Facility	1,270	6,234
SR - 310-LI-	Replacement HLW Evaporator	15,031	16,932
SR - 311-LI-	Diversion Box & Pump Pit Containment	4,697	2,004
SR - 312-LI-	Hazardous LLW Processing Tanks	5,326	15,300
SR - 313-LI-	Inter Area Line Upgrade	2,304	3,170
SR - 314-LI-	HLW Removal from Filled Waste Tanks	8,070	11,578
SR - 410-LI-	New Sanitary Landfill	662	2,283
	Subtotal: SR, SAVANNAH RIVER SITE, WM	455,266	576,131
	Subtotal: SR, SAVANNAH RIVER SITE	505,000	643,923
	Subtotal: SR	523,699	664,624

FY 1992: These data reflect the FY1992 appropriations by program; they may not reflect all final budget execution decisions by ADS.

FY 1993: These data reflect the FY1993 appropriations by program; the allocations by ADS may be revised as the year progresses.

APPENDIX H
Federal Pollution Abatement Plan (A-106)
Relationship to EM ADSs

ADS Number	Title	A-106 No.	A-106 Title
AL -1001-GJ	Monticello Remedial Action Proj./Utah Grant	MRAP	Monticello Remedial Action Project (MRAP)
AL -1002-GJ	Monticello Surface and Groundwater Remed.	MSG	Monticello Surface And Groundwater Remed.
AL -1003-GJ	Monticello Vicinity Properties Project	MVP	Monticello Vicinity Properties (MVP)
AL -1005-GJ	Grand Junction P.O. Remedial Action Proj.	GJPOD&D	GJPO Remedial Action Program (GJPORAP)
ALIT- 13	GPP Corrective Activities	5ALITRI901	Construction Of Sewerline
		5ALITRI911	Replace Underground Fuel Oil Storage Tanks
ALIT-1013	Diesel Oil Assessment and Remediation	5ALITRI935	Diesel Oil Release Remediation
		5ALITRI923	Diesel Oil Release Assessment
		5ALITRI937	Diesel Oil Release Assessment Near 30,000 Gal
ALIT-1015	Hot Pond Assessment and Remediation	5ALITRI924	Hot Pond Characterization/Assessment
		5ALITRI903	Hot Pont Removal
		5ALITRI931	Hot Pond Remediation
ALIT-1019	Groundwater&Sanitary Lagoons Assess & Remed.	5ALITRI934	Nitrates In Groundwater Remediation
		5ALITRI921	Sanitary Sewage Lagoons Characterization
		5ALITRI922	Nitrates In Groundwater Assessment
		5ALITRI932	Sanitary Sewage Lagoons Remediation
ALIT-3265	GPP Waste Management	5ALITRI891	Waste Storage Bldg Addition/Upgrade
ALKC-1024	Abandoned Indian Creek Outfall Remed.	ALKC-1024	Abandoned Indian Creek Outfall Remediation
ALKC-1028	Department 26	ALKC-1028	Department 26 Assess & Remediation
ALKC-1029	Department 27 Inside	ALKC-1029	Department 27 Inside Assess & Remediation
ALKC-1030	Department 27 Interim Measures	ALKC-1030	Department 27 Interim Measures
ALKC-1032	Miscellaneous Contaminated Sites	ALKC-1032	Miscellaneous Contaminated Sites
ALKC-1034	Miscellaneous PCB Sites	ALKC-1034	Miscellaneous PCB Sites
ALKC-1036	NEPA Environmental Assessment	ALKC-1036	NEPA Environmental Assessment
ALKC-1038	Outfall 001 Raceway & Retention Pond	ALKC-1038	Outfall 001 Raceway & Retention Pond
ALKC-1040	Plating Building	ALKC-1040	Plating Bldg.
ALKC-1042	RCRA South Lagoon Closure Groundwater	ALKC-1042	RCRA South Lagoon Closure Groundwater
ALKC-1044	Groundwater Treatment & Monitoring	ALKC-1044	Groundwater Treatment & Monitoring
ALKC-1046	TCE Still Area Soils	ALKC-1046	TCB Still Area Soils
ALKC-1048	Department 71 & Truck Shop Sump	ALKC-1048	Department 71 & Truck Shop Sump
ALKC-1050	Northeast Area	ALKC-1050	Northeast Area
ALKC-1723	KCP Corrective Activities	ALKC-XXX	Flood Protection Improvements
		KC001	NPDES Sewer Systems
		KC0019	Repair And Seal Storage Lots
ALKC-3001	General Plant Projects Waste Management	ALKC-0030	Modify Demolition Lot
		KC0029	Protection Of Waste Management Storage Areas
ALKC-3002	New Facility Planning	KC009	Eliminate TTOS (Separate Process Waste Water)
ALLA- 42	ES&H Improvements (Haz. Waste Treat. Fac.)	ALLA0042	ES&H Improvements (Haz. Waste Treat. Fac.)
ALLA- 43-A	High Explosive (HE) Wastewater Treatment	ALLA0043	Centralized HS Wastewater Treatment Facility
ALLA- 51	Sanitary Wastewater Systems Consolidation	ALLA0051	Sanitary Wastewater Systems Consolidation
		ALLA0051A	Sanitary Wastewater Systems Consolidation
ALLA- 74	Air Exhaust Mods.	ALLA0074	New Stack At LAMPF
ALLA- 81	Corrective Activities	ALLA0081	Corrective Activities Master ADS
		ALLA0049	Replace PCB Transformers & Capacitors
		ALLA0055	Underground Storage Tanks
		ALLA0070	Water Supply System/Cross-connection

ADS Number	Title	A-106 No.	A-106 Title
		ALLA3263	RCRA Active Firing Sites
		ALLA080	NPDES Projects
ALLA- 82	GPP Corrective Activities	ALLA082	Corrective Activities GPP ADS
ALLA-1049	Canyons	ALLAOP9115	ER Program-Remediation Phase
ALLA-1062	Interim Remedial Measures	ALLAOP9115	ER Program-Remediation Phase
ALLA-1063	Interim Remedial Measures	ALLAOP9115	ER Program-Remediation Phase
ALLA-1066	NEPA Documentation for Disposal Facility	ALLAOP9115	ER Program-Remediation Phase
ALLA-1067	RCRA Mixed Waste Storage/Disposal Facility	ALLAOP9115	ER Program-Remediation Phase
ALLA-1071	TA-0, 19, 26, 73, 74	ALLAOP9115	ER Program-Remediation Phase
ALLA-1078	TA-1	ALLAOP9115	ER Program-Remediation Phase
ALLA-1079	TA-10,31,32,45	ALLAOP9115	ER Program-Remediation Phase
ALLA-1082	TA-11,13,16,24,25,28,37	ALLAOP9115	ER Program-Remediation Phase
ALLA-1086	TA-15	ALLAOP9115	ER Program-Remediation Phase
ALLA-1093	TA-18, 27, 65	ALLAOP9115	ER Program-Remediation Phase
ALLA-1098	TA-2, 41	ALLAOP9115	ER Program-Remediation Phase
ALLA-1106	TA-21	ALLAOP9115	ER Program-Remediation Phase
ALLA-1111	TA-6,7,22,40,58,62	ALLAOP9115	ER Program-Remediation Phase
ALLA-1114	TA-3,59,60, 61, 64	ALLAOP9115	ER Program-Remediation Phase
ALLA-1122	TA-33	ALLAOP9115	ER Program-Remediation Phase
ALLA-1127	TA-35 Waste Oil Storage Pit Etc.	ALLAOP9115	ER Program-Remediation Phase
ALLA-1129	TA-4,5,35,42,48,52,55,63,66	ALLAOP9115	ER Program-Remediation Phase
ALLA-1130	TA-36,68,71	ALLAOP9115	ER Program-Remediation Phase
ALLA-1132	TA-39	ALLAOP9115	ER Program-Remediation Phase
ALLA-1135	TA-40 Scrap Detona. Site Closure	ALLAOP9115	ER Program-Remediation Phase
ALLA-1140	TA-46 Assessment	ALLAOP9115	ER Program-Remediation Phase
ALLA-1144	TA-49	ALLAOP9115	ER Program-Remediation Phase
ALLA-1147	TA-50	ALLAOP9115	ER Program-Remediation Phase
ALLA-1148	TA-51, 54	ALLAOP9115	ER Program-Remediation Phase
ALLA-1157	TA-8,-9,-23,-69	ALLAOP9115	ER Program-Remediation Phase
ALLA-2105	Programmatic Tech Support	ALLAOP9115	ER Program-Remediation Phase
ALLA-2107	Programmatic Management	ALLAOP9115	ER Program-Remediation Phase
ALLA-2110	ER Analytical Chemistry Facility	ALLAOP9115	ER Program-Remediation Phase
ALLA-3256	Mixed Waste Receiving and Storage Facility	ALLA3256	Mixed Waste Receiving & Storage Fac.
ALLA-4172	Facility Operations and Maintenance	ALLA3056	Asbestos & PCB Disposal
ALLA-4173	General Plant Projects Waste Management	ALLA3086	Storage/Waste Oil And Storage Facility
		ALLA3091	Emergency Power Supply
ALLA-4174	New Facility Planning	ALLA3080	Radioactive Liquid Waste Treatment Facility
		ALLA3089	Sludge Solidification Bldg.
		ALLA3097	Treatment/Radioactive Waste Line
ALMD-1165	Decommissioning of Building 21	ALMD1165	Bldg. 21 Decommissioning
ALMD-1167	Decommissioning of Plutonium Processing Bldg	ALMD1167	PP Bldg. Decommissioning
ALMD-1170	Decommissioning of Spec. Metallurgical Bldg.	ALMD1170	SM Bldg. Decommissioning
ALMD-1172	Decommissioning of Semi-Works Cave Areas	ALMD1172	SW Cave Decomm.
ALMD-1175	Decommissioning of Underground Lines	ALMD1175	Underground Lines Decomm.
ALMD-1176	Decommissioning of Waste Transfer System	ALMD1176	Waste Transfer System
ALMD-1201	OU1 Area B Groundwater	ALMD01A	Area A Groundwater
ALMD-1202	OU2 Main Hill Seeps	ALMD02A	Main Hill Seeps
ALMD-1203	OU3 Miscellaneous Sites	ALMD03A	Misc Sites
ALMD-1204	OU4 Miami-Erie Canal	ALMD04A	Miami-Erie Canal
ALMD-1205	OU5 RAD Contaminated Soils	ALMD05A	RAD Contaminated Soils
ALMD-1206	OU6 D&D Sites Haz Con	ALMD06A	D&D Sites Haz Constituents
ALMD-1209	OU9 Sitewide RI/FS	ALMD09A	Site-Wide RI/FS
ALMD-1210	Program Management	ALMDMGT	ER Program Management
		ALMD10A	Misc Activities Related To RI/FS Tasks
ALMD-4028	Decommissioning of EW Soil	ALMD4028	Soils Decommissioning
ALPP-1001	4.5 Acre Site	ALPP001	Pinellas-4.5 Acre Site
ALPP-1005	Miscellaneous Sites	AL1005051	Pinellas-Miscellaneous Sites
ALPP-1010	PRP Participation	AL1010051	Pinellas-Peak Oil Superfund Site (PRP)
ALPP-1012	Sludge Holding Tank	AL1012051	Pinellas-Sludge Holding Tank Closure
ALPX- 68	BCRA Waste Staging Area	1ALPX008	ES&H Enhancement RCRA

ADS Number	Title	A-106 No.	A-106 Title
ALPX- 69	Waste Treatment Equipment	1ALPX026	Waste Treatment Equip.
ALPX- 70	HW Stagomg Facility	1ALPX009	HW Staging Facility
ALPX-1198-AR	Chemical Releases Assessment/Remediation	1ALPX001	ER Program Pantex
ALPX-1200-AR	Construction Landfills Assessment/Remed.	1ALPX001	ER Program Pantex
ALPX-1203-AR	Fire Department Burn Pits Assessment/Remed.	1ALPX001	ER Program Pantex
ALPX-1205-AR	Firing Sites Assessment/Remediation	1ALPX001	ER Program Pantex
ALPX-1207-AR	Former Cooling Tower Assessment/Remediation	1ALPX001	ER Program Pantex
ALPX-1212-AR	High Explosive/Rad. Sites Assessment/Remed.	1ALPX001	ER Program Pantex
ALPX-1213-AR	Hypalon Pond Assessment and Remediation	1ALPX001	ER Program Pantex
ALPX-1215	NEPA Documentation - Assessment	1ALPX001	ER Program Pantex
ALPX-1216-AR	Onsite Playas and Ditches Assessment/Remed.	1ALPX001	ER Program Pantex
ALPX-1219-AR	Priority Reconnaissance Assessment/Remed.	1ALPX001	ER Program Pantex
ALPX-1220-AR	Old Sewage Treatment Plant Assessment/Remed.	1ALPX001	ER Program Pantex
ALPX-1222-AR	Supplemental Sites Assessment/Remediation	1ALPX001	ER Program Pantex
ALPX-1223-AR	Underground Storage Tanks Assessment/Remed.	1ALPX001	ER Program Pantex
ALPX-1227-AR	Leaking Undergrd Stor Tank Assessment/Remed.	1ALPX001	ER Program Pantex
ALPX-1229	ER Program Management	1ALPX001	ER Program Pantex
ALPX-1230-AR	Zone 12 Groundwater Assessment/Remediation	1ALPX001	ER Program Pantex
ALPX-1232-AR	Burning Ground Assessment/Remediation	1ALPX001	ER Program Pantex
ALPX-1235	Hydrogeologic Investigations	1ALPX001	ER Program Pantex
ALPX-1236	Interim Corrective Measures (Remediation)	1ALPX001	ER Program Pantex
ALPX-3102	Facility Operations and Maintenance	1ALPX033	Waste Chemical Control Computer System
		1ALPX034	Hazardous Waste Unit Closure 11-44
		1ALPX035	Hazardous Waste Unit Closure 12-43
		1ALPX044	Onsite Landfill Improvements
		1ALPX045	Hazardous Waste Unit Closure-Obsolete Burning
ALPX-3103	Hazardous Waste Treatment and Processing Fac	1ALPX027	Hazardous Waste Treatment & Processing Fac.
ALPX-3104	General Plant Projects Waste Management	1ALPX036	Burning Ground Upgrades
ALPX-3105	New Facility Planning	1ALPX041	High Explosive Incinerator
		1ALPX042	Water Balance & Sewer Upgrade
		1ALPX043	Containment Improvements
ALSA-1136	New Facility Planning	ISNLA041	New Facility Planning
ALSA-1155	Corrective Activities Operating/CAP EQ	ISNLA034	Corrective Activities Operating/Cap Eq
		ISNLA010	Corrective Activities Operating/Cap Eq
		ISNLA080	Corrective Activities Operating/Cap Eq
ALSA-1156	GPP Corrective Activities	ISNLA080	Corrective Activities GPP
ALSA-1266	Central Coyote Test Field	ALSA-1266	Environmental Restoration - Assessment
ALSA-1267	Chemical Waste Landfill	ALSA-1267	Environmental Restoration
ALSA-1270	Coyote Canyon Blast Area	ALSA-1270	Environmental Restoration
ALSA-1272	Coyote Springs Area	ALSA-1272	Environmental Restoration - Assessment
ALSA-1273	Edgewood Test Site	ALSA-1273	Environmental Restoration - Assessment
ALSA-1281	Kauai Test Facility	ALSA-1281	Environmental Restoration
ALSA-1282	Lurance Canyon	ALSA-1282	Environmental Restoration - Assessment
ALSA-1284	Multi-Party Sites	ALSA-1284	Environmental Restoration
ALSA-1288	Pendulum Area	ALSA-1288	Environmental Restoration - Assessment
ALSA-1289	Mixed Waste Landfill	ALSA-1289	Environmental Restoration - Assessment
ALSA-1293	Schoolhouse Mesa Test Site	ALSA-1293	Environmental Restoration - Assessment
ALSA-1295	Septic Tanks and Drainfields	ALSA-1295	Environmental Restoration - Assessment
ALSA-1297	South Coyote Test Field	ALSA-1297	Environmental Restoration - Assessment
ALSA-1298	SW Coyote Test Field	ALSA-1298	Environmental Restoration - Assessment
ALSA-1300	Leaking Underground Storage Tanks (LUST)	ALSA-1300	Environmental Restoration
ALSA-1302	Tech Area 1	ALSA-1302	Environmental Restoration - Assessment
ALSA-1303	Tech Area 2	ALSA-1303	Environmental Restoration - Assessment
ALSA-1306	Tech Area 3 and 5	ALSA-1306	Environmental Restoration - Assessment
ALSA-1307	Liquid Waste Disposal	ALSA-1307	Liquid Waste Disposal Assess.
ALSA-1308	Thunder Range	ALSA-1308	Environmental Restoration - Assessment
ALSA-1309	Tijeras Arroyo	ALSA-1309	Environmental Restoration - Assessment
ALSA-1311	Tonopah Test Range Area 9	ALSA-1311	Environmental Restoration - Assessment
ALSA-1312	Tonapah Test Range Area 3	ALSA-1312	Environmental Restoration - Assessment
ALSA-1313	Tonapah Test Range, Test Area	ALSA-1313	Environmental Restoration - Assessment

ADS Number	Title	A-106 No.	A-106 Title
ALSA-1327	Remote Facilities	ALSA-1327	Remote Facilities Assess.
ALSL- 103	Corrective Activities	1ALSNLL010	TRL Tritium Monitor System Replacement
ALSL-1350	Remediation Program Management/Tech. Support	1ALSNLL011	Assessment of Potential Release Sites
		1ALSNLL012	Remediation of Release Sites
ALSL-1351	Fuel Oil Spill Assessment/Remediation	1ALSNLL012	Remediation of Release Sites
		1ALSNLL011	Assessment of Potential Release Sites
		ALSL-1351	Fuel Oil Spill Assessment/Remediation
ALSL-1352	Navy Landfill Assessment/Remediation	1ALSNLL011	Assessment of Potential Release Sites
		1ALSNLL012	Remediation of Release Sites
		ALSL-1352	Navy Landfill Assessment/Remediation
ALSL-1353	Miscellaneous Sites Assessment	1ALSNLL011	Assessment of Potential Release Sites
		ALSL-1353	Misc Site Assessments
ALWP-3234	Base Waste Management - Storage	WIPP-01	Prep of RCRA Permit Appl. Disposal Phase
		WIPP-02	NEPA Documentation For Disposal Phase SEIS II
		WIPP-03	VOC-NEW Equipment & Program Modifications
		WIPP-04	TRUPACT Cleaning Facility
		WIPP-05	Sewage Lagoon
		WIPP-06	Haz Waste Minimization Program
		WIPP-07	No-migration Variance Petition For Disposal
		WIPP-08	Clean Air Act Amendments Air Toxics/NESHAP
		WIPP-09	Clean Water Act-Stormwater Permit
		WIPP-10	Solid Waste Management Units - Phase I Assess
		WIPP-11	Test Phase RCRA Permitting Fee
		WIPP-12	NEPA Mitigation Action Plan For SEIS II
		WIPP-13	Groundwater Monitoring Wells
		WIPP-14	Mining Waste Management - RCRA Solid Waste Rq
		WIPP-15	Waste Water Treatment Plant (TRUPACT)
		WIPP-16	Hazardous Air Pollutant Emission Inventory
		WIPP-17	ROC (Record of Decision) To SEIS II
		WIPP-18	Equipment Washdown Facility
		WIPP-19	Upgrades To Maintain Compliance With RCRA
		WIPP-20	Underground Fuel Tanks Replacement
		WIPP-21	Modify Test Phase Permit: Wet Bins & Alcove
		WIPP-22	Permit For Source Term Tests In Waste Hdlg Bl
		WIPP-23	40 CFR 191 Compliance Report
		WIPP-24	TRUPACT Cleaning Fac. & Waste Water Treatment
CH -1300	Continuity of Operations	CHANL1300	TRU Waste Managment (AGHCF Upgrade)
CH -1301-A	WM Projects Non-Defense	CHANL1301A	WM Project Non-defense
CH -1302	PCB Transformer Disposal	CHANL1302	PCB Transformer Disposal
CH -1303	Rehabilitation of Waste Management Building	CHANL1303	Rehabilitation Of Waste Management Bldg.
CH -1304	Hazardous, Rad. & Mixed Waste Storage Facil.	CHANL1304	Haz, Radioactive & Mixed Waste Storage Fac.
CH -1305	UST Upgrade/Replacement	CHANL1305	Underground Storage Tank Upgrade/Replacement
CH -1306	Sanitary Waste Water Treatment Plant Impr.	CHANL1306	SWT Plant Improvements/Upgrade
CH -1307	800 Area Landfill Leachate Collection/Treat.	CHANL1307	800 Area Landfill Leachate Coll/Treatment
CH -1308	Lab and Sanitary Sewer Collection Sys. Rehab	CHANL1308	Lab & Sanitary Sewer Collection System Rehab.
CH -1309	Laboratory Waste Water Treatment Plant Impr.	CHANL1309	LWT Plant Improvements/Upgrade
CH -1310	Treatment of Boiler House Area Waste Water	CHANL1310	Treatment Of Boiler House Area Waste Water
CH -1311	Canal Water Treatment Rehabilitation	CHANL1311	Canal Water Treatment Rehabilitation
CH -1312	Chloride Removal Plant	CHANL1312	Chloride Removal Plant
CH -1313	Cooling Tower Blowdown Water Diversion	CHANL1313	Cooling Tower Blowdown Water Diversion
CH -1401	800 Area Landfill Remedial Activities	CHANL1401	800 Area Landfill Remedial Activities
CH -1402	East Area Sewage Treatment Plant	CHANL1402	East Area Sewage Treatment Plant
CH -1403	570 Holding Pond	CHANL1403	570 Holding Pond
CH -1404	Sawmill Creek Remedial Activities	CHANL1404	Sawmill Creek Remedial Activities
CH -1405	317/319/ENE Area	CHANL1405	317/319/ENE Area
CH -1406	100 Area	CHANL1406	100 Area
CH -1407	Outfall Area	CHANL1407	Outfall Area
CH -1408-A	Sitewide Hydrogeological Baseline Study	CHANL1408A	Site-Wide Hydrogeological Baseline Study
CH -1408-B	Sitewide Well and Borehole Closure	CHANL1408B	Site-Wide Well And Borehole Closure
CH -1409-A	Inactive Waste Sites Management Plan	CHANL1409A	Inactive Waste Site Management Plan

ADS Number	Title	A-106 No.	A-106 Title
CH -1411	Lime Sludge Removal	CHANL1411	Lime Sludge Removal
CH -1412	D&D Experimental Boiling Water Reactor	CHANL1412	D&D Experimental Boiling Water Reactor (EBWR)
CH -1413	D&D of CP-5 Reactor	CHANL1413	D&D of CP-5 Research Reactor
CH -1414	D&D of Hot Cells	CHANL1414	D&D of The Hot Cells
CH -1415	D&D of Juggernaut Reactor	CHANL1415	D&D of The Juggernaut Reactor
CH -1416	D&D of Argonne Thermal Source Reactor (ATSR)	CHANL1416	D&D of The Argonne Thermal Source Reactor
CH -1417	D&D of 60" Cyclotron	CHANL1417	D&D of 60-Inch Cyclotron
CH -1418	D&D of ZPR Reactor Facilities, Building 315	CHANL1418	D&D of The ZPR Reactor Facilities, Bldg. 315
CH -1601	Facility Operations and Maintenance (NonDef)	90CHANLW50	Hazardous/Mixed Waste Operations
		90CHANLW51	Radioactive Scrap & Waste Facility Operations
CH -1602	General Plant Project Waste Mgmt. (NonDef)	93CHANLW49	Radioactive Scrap & Waste Facility Operations
		95CHANLW48	Underground Storage Tanks Upgrade
		93CHANLW55	Underground Storage Tank Upgrade
CH -1603	Corrective Activities	88CHANLW38	RSWF Part B Permit Application & Upgrades
		89CHANLW43	Underground Storage Systems Release Detection
		89CHANLW46	Liners-RSWF RCRA Permit Compliance
CH -1604	New Facilities Planning (Defense)	92CHANLW52	Radioactive NA Waste Process Facility
		93CHANLW54	Radioactive NA Waste Process Facility
CH -1605	New Facilities Planning (Non-Defense)	92CHANLW60	Waste Handling Facility (Construction)
CH -1701	PCB Spill Cleanup	88CHANLW44	Clean-Up of Historical PCB Spill
CH -1702	WAG 9 Assessment	87CHANLW56	Operable Unit 9-01 (Track 1)
		87CHANLW57	Operable Unit 9-02 (Track 2)
		87CHANLW58	Operable Unit 9-03 (Track 2)
		87CHANLW59	Operable Unit 9-04 (RI/FS)
		88CHANLW42	Sampling & Analysis for Background Data
CH -1703	CLPA Decontamination & Decommissioning	91CHANLW45	D&D Evaporator in Bldg. 752
CH -2202	Waste Management Facility Phase II	93CHBNL031	Hazardous Waste Managment Upgrade II
CH -2203	Waste Minimization Facility Upgrades	90CHBNL025	Waste Minimization Facilities Upgrades
CH -2204	Floor Drain Reconnection	93CHBNL032	Floor Drain Reconnection
CH -2205	Waste Management Facility Phase III	94CHBNL039	Hazardous Waste Management Facility Upgrade I
CH -2206	Waste Management Upgrades I	90CHBNL013	Hazardous Waste Management Facility Upg.-1
CH -2300	Program Management	CH-2300	Program Management
CH -2301	Brookhaven Graphite Research Reactor D&D	CH-2301	Brookhaven Graphite Research Reactor (BGRR)
CH -2302	Sitewide Activities	88CHBNL011	Groundwater Monitoring Program
		CH-2302	Site-Wide Activities
CH -2303	Operable Unit I	CH-2303	Operable Unit I
CH -2304	Operable Unit II	CH-2304	Operable Unit II
CH -2305	Operable Unit III	CH-2305	Operable Unit III
CH -2306	Operable Unit IV	CH-2306	Operable Unit IV
CH -2307	Operable Unit V	CH-2307	Operable Unit V
CH -2308	Operable Unit VI	CH-2308	Operable Unit VI
CH -2309	Operable Unit VII	CH-2309	Operable Unit VII
CH -2310	Removal Activities	88CHBNL012	Storage Tank Removal
		CH-2310	Removal Actions
CH -3100	Waste Operations	94CHPPPL24	Disposal of PCB Capacitors
CH -3101-01	Upgrade to Existing Haz. Materials Stor. Fac	CH-3101-01	Upgrades To Hazardous Materials Storage Fac.
CH -3102-01	Underground Storage Tank Remediation	CH-3102-01	Underground Storage Tank Remediation
CH -3201	Groundwater Characterization/Remediation	CH-3201	Groundwater Characterization & Remediation
CH -3202	CERCLA Past Waste Site Investigation	CH-3202	CERCLA Inventory of Past Hazd Substances Rel.
CH -4100	Waste Management Activities	90CHFNAL07	Clean-UP PCB Contam. At Main Ring Serv. Bldgs
		91CHFNAL09	Main Ring Transformer PCB Concentration Red.
		92CHFNAL13	RCRA Facility Investigation (RFI) Part B Pmt.
CH -4101-01	Low-Level Radioactive Waste Sort/Repackage	93CHFNAL11	Radioactive Waste Process Bldgs.
CH -4200	Chromate Contamination Cleanup	92CHFNAL10	Clean-Up of Chromates In Main Ring Perf. Pipe
CH -5201	UST Contamination Assessment/Remediation	90CHAMES05	Contaminated (Diesel Fuel Oil) Soil Removal
		90CHAMES06	Underground Storage Tank System Upgrade
CH -5202-EW	Ames Chemical Disposal Site RI/FS & RD/RA	91CHAMES08	Chemical Disposal Site Remediation
CH -5202-EX	Ames Chemical Disposal Site RI/FS & RD/RA	91CHAMES07	Chemical Disposal Site Assessment
CH -5204	Inactive Waste Site Characterization	92CHAMES09	Inactive Waste Site Characterization Act.
FS - 10-B4	RMI Site	1FNFEMP008	Env Res-RMI/Fields Break

ADS Number	Title	A-106 No.	A-106 Title
FS - 16-C3	Waste Management	1FNFEMP007	Waste Mgmt Oper-Backing Low Level Waste Tmt.
FS - 30-B2	Regulatory Oversight	1FNFEMP009	Env Res-CEPA Env Monitoring Oversight
FS - 46-B2	Operable Unit 1	1FNFEMP001	Env Res-RI/FS Operable Unit 1
FS - 47-B2	Operable Unit 2	1FNFEMP002	Env Res-Required Closures & Removal
FS - 48-B2	Operable Unit 3	1FNFEMP003	Env Res-Response Action-Operable Unit 3
FS - 49-B2	Response Action - Operable Unit 4	1FNFEMP004	Env Res-Response Action-operable Unit 4
FS - 50-B2	Operable Unit 5	1FNFEMP005	Corrective Action-Water Qual Improvements
FS - 52-B2	Remedial Support Facilities	1FNFEMP010	Env Res-Remedial Support Facilities
FS - 64-D1	Long Term Monitoring	1FNFEMP006	Corrective Action-Air Quality Improvement
FS - 69-D1	Project Support	1FNFEMP011	Env Res-Hazards Abatement
ID - 28-EG	WAG 1 TAN -Test Area North Assess./Cleanup	E.9.2.1	RCRA/CERCLA Environmental Restoration Program
ID - 30-EG	WAG 2 TRA -Test Reactor Area Assess./Remed.	E.9.2.1	RCRA/CERCLA Environmental Restoration Program
ID - 34-EG	WAG 4/CFA -Central Fac. Area Assess./Cleanup	E.9.2.1	RCRA/CERCLA Environmental Restoration Program
ID - 36-EG	WAG 5 - PBF & ARA Assessment/Cleanup	E.9.2.1	RCRA/CERCLA Environmental Restoration Program
ID - 38-EG	WAG 6 - EBR-1/Borax Assessment/Cleanup	E.9.2.1	RCRA/CERCLA Environmental Restoration Program
ID - 40-EG	WAG 7/RWMC - Radioactive Waste Mgmt. Complex	E.9.3	INEL Buried Waste Remedial Action Program
ID - 41-EG	WAG 10 - Misc. Units Assessment/Cleanup	E.9.2.1	RCRA/CERCLA Environmental Restoration Program
ID - 45-EG	S&M-D&D Surveillance and Maintenance	E.9.2.1	RCRA/CERCLA Environmental Restoration Program
ID - 48-EG	ARA II D&D	E10.3.1	D & D Activities (Defense)
ID - 49-EG	ARA III D&D	E10.3.1	D & D Activities (Defense)
ID - 50-EG	WRRTF Hot Waste Tank	E10.3.1	D & D Activities (Defense)
ID - 51-EG	TAN - TSF D&D	E10.3.1	D & D Activities (Defense)
ID - 52-EG	ARA I D&D	E10.3.1	D & D Activities (Defense)
ID - 53-EG	TAN 607 Decon Shop D&D	E10.3.1	D & D Activities (Defense)
ID - 54-EG	MTR D&D	E10.3.1	D & D Activities (Defense)
ID - 60-EG	ETR D&D	E10.3.1	D & D Activities (Defense)
ID - 63-EG	Borax-V D&D	E10.3.2	D & D Activities (Nuclear Energy)
ID - 65-EG	Loft Ancillaries D&D	E10.3.2	D & D Activities (Nuclear Energy)
ID - 67-EG	TTAF D&D	E10.3.2	D & D Activities (Nuclear Energy)
ID - 102-EG	Inactive Underground Storage Tanks	E.9.2.1	RCRA/CERCLA Environmental Restoration Program
ID - 103-E1	INEL ER Tiger Team	E.9.2.1	RCRA/CERCLA Environmental Restoration Program
ID - 111-E1	Program Management Support	E.9.2.1	RCRA/CERCLA Environmental Restoration Program
ID - 112-E1	FFA/CO Grant to Idaho	E.9.2.1	RCRA/CERCLA Environmental Restoration Program
ID - 112-E2	SHOSHONE - BANNOCK	E.9.2.1	RCRA/CERCLA Environmental Restoration Program
ID -1001-WN	Waste Operations	IC-0002	Waste Management - Treatment
		IC-0004	Waste Management - Storage
		IC-0005	Waste Management - Disposal
		IC-0014	Liquid Effluent Treat & Disposal (LET&D) ICPP
		ID-1006C	Waste Line Contaminants - ICPP
		ID-1045C	Waste Management - Waste Minimization
		W-5.1	Mixed Waste Rule Compliance - ICPP
ID -1004-WN	New Facilities Planning	IC-0002	Waste Management - Treatment
		IC-0004	Waste Management - Storage
		IC-0005	Waste Management - Disposal
ID -1005-WN	HLW Tank Farm Replacement - Phase I	IC-0002	Waste Management - Treatment
		IC-0004	Waste Management - Storage
ID -1008-WN	New ICPP Mission Activities	ID1008	New Icpp Mission Activities
ID -1204-WN	WAG 3 ER - Assessment Cleanup	E.9.2.1	RCRA/CERCLA Environmental Restoration Program
		ID 1204-WN	Environmental Restoration, Assessment & Clean
ID -1304-WN	CPP-603 Decontamination and Demolition	E.10.3.1	D & D Activities (Defense)
ID -1305-WN	SFE-20/CPP-740 D&D Activities	ID-1305WN	SFE-20/CPP-740 D&D Activities
ID -1306-WN	CPP-631, -709, -734, CRS D&D Programs	ID 1306WN	CPP 631, 709, 734, D&D Programs
ID -1307-WN	CPP-640 D&D	ID 1307-WN	CPP 640 D&D
ID -1308-WN	CPP-601 Decommissioning and Decontamination	ID 1308-WN	CPP 601 D&D
ID -1309-WN	Waste Calcine Facility D & D	ID 1309WN	Waste Calcine Facility D & D
ID -1310-WN	Tank Farm Decontamination & Decommissioning	ID 1310WN	Tank Farm D&D
ID -1311-WN	WINCO Post D&D S&M Program	E.9.2.1	RCRA/CERCLA Environmental Restoration Program
ID -4103-EG	Waste Minimization/Pollution Prevention	IE-0020	Waste Management - Waste Minimization
ID -4302-EG	New Facility Planning	IE-0009	Waste Management - Storage
		IE-0010	Waste Management - Treatment

ADS Number	Title	A-106 No.	A-106 Title
		IE-0012	Waste Management - Disposal
ID -4306-EG	Solid Waste Transfer Station (LI)	IE-0012	Waste Management - Disposal
ID -4307-EG	Dry Cask Storage Project (LI)	IE-0009	Waste Management - Storage
ID -4309-EG	Waste Characterization and Storage Facility	IE-0009	Waste Management - Storage
ID -4310-EG	Waste Reduction Operations Complex	IE-0009	Waste Management - Storage
		IE-0010	Waste Management - Treatment
		IE-0012	Waste Management - Disposal
ID -4311-EG	Radioactive Waste Management Complex	IE-0009	Waste Management - Storage
		IE-0012	Waste Management - Disposal
ID -4312-EG	Text Area North	IE-0009	Waste Management - Storage
		IE-0010	Waste Management - Treatment
NV - 201-AA	Program Management Support	NV201-AA	Nepa Support
NV - 211-AA	Plutonium Soils	NV-211-AA	Plutonium Contaminated Soils
NV - 212-AA	Groundwater Characterization Project	NV-212-AA	Groundwater Characterization Project
NV - 213-AA	Test Areas	NV-213-AA	Underground Test Areas Remedial Actions
NV - 214-AA	RCRA Industrial Sites	NV-214-AA	RCRA Industrial Sites
NV - 215-AA	CERCLA Industrial Sites	NV-215-AA	CERCLA Industrial Sites
NV - 334-AA	New Facility Planning	NV-334-AA	New Facility Planning
NV - 335-AA	GPP Waste Management	NV-335-AA	GPP Waste Management
NV - 336-AA	Corrective Activities	NV-336-AA	Corrective Activities
OR -1301-AA	NEW YORK Sites - Assessment & Cleanup	158	Niagara Falls Storage Site (NFSS)
		139	Colonie Interim Storage Site (CISS)
OR -1302-AA	NEW JERSEY Sites - Assessment & Cleanup	138	Maywood Interim Storage Site (MISS)
		137	Wayne Interim Storage Site (WISS)
		118	Middlesex Sampling Site (MSP)
OR -1303-AA	MISSOURI Sites - Assessment & Cleanup	140	Latty Avenue Properties
OR -2101	Steam Plant Ash Disposal Facility LI Proj	10RY12119	Steam Plant Ash Disposal Facility
OR -2102	Corrective Activities	10RY12227	Treatment Plant Discharges
		10RY12230	Non-point Source Pollution Control
		10RY12233	Cooling Towers
		10RY12234	Cooling Towers
OR -2103	General Plant Projects, Corrective Act.	10RY12225	Nonpermitted Plant Drains
		10RY12263	Cooling Water Discharges
		10RY12270	Sanitary Sewer System
		10RY12271	Sanitary Sewer System Rehabilitation
		10RY12280	Non-permitted Plant Drains
OR -2201	Facility Operations & Maintenance	10RY12226	Non-permitted Plant Drains
		10RY12245	Treatment-privatization
		10RY12281	Facility Operations & Maintenance
OR -2202	Site-Wide Activities	10RY12180	Environmental Surveillance Upgrades
		10RY12181	Environmental Surveillance Upgrades
		10RY12200	Waste Minimization
		10RY12201	Waste Minimization
		10RY12264	Cooling Water Discharges
		10RY12266	Non-point Source Pollution Control
		10RY12269	Sanitary Sewer System Rehabilitation
OR -2203	Prod Waste Storage Faciltiy (PWSF)	10RY12199	Production Waste Storage Facility
OR -2204	Industrial Waste Compaction Facility (IWCF)	10RY12273	Industrial Waste Compaction Facility
		10RY12275	Industrial Waste Compaction Facility
OR -2205	Plant Drains Wastewater Treatment Upgrades	10RY12ZZZ	Drain Waste Water Treatment
OR -2206	General Plant Project WM-DP	10RY12265	Cooling Water Discharges
		10RY12272	General Plant Projects
		10RY12279	Non-permitted Plant Drains
OR -2207	New Facilities	10RY12262	Treatment Plant Discharges
		10RY12XXX	Future Line Item Projects
		10RY12YYY	Future Line Item Projects
OR -2301	Chestnut Ridge	10RY12256	Chestnut Ridge
OR -2302	Bear Creek Valley	10RY12255	Bear Creek Valley
OR -2303	Upper East Fork Poplar Creek (UEFPC)	10RY12257	Upper East Fork Poplar Creek
OR -2304	CAPCA Phase I	10RY12136	RCRA Closures Phase I (CAPCA Project)

ADS Number	Title	A-106 No.	A-106 Title
OR -2305	CAPCA Phase II	10RY12224	Capca Phase II Assessments
OR -2701	Y-12 Plant Facilities D&D	10RY122701	Y-12 Plant Facilities Decontamination & Decom
OR -3101	Bethel Valley LLLW-CAT System Upgrade	50RORNL337	Bethel Valley LLLW Collection & Transfer Sys.
		50RORNL754	Bethel Valley LLW Collection & Transfer Sys.
OR -3102	Melton Valley LLLW CAT SYSTEM Upgrade	50RORNL451	MV LLW Collection & Xfer System Upgrade
		50RORNL700	Melton Valley LLLW Collection & Transfer Sys.
OR -3103	Corrective Activities - Defense	50RORNL829	LLLW Tank FFA Compliance
OR -3104	Corrective Activities - NonDefense	50RORNL876	Subtitle I USTS Capital Equipment (WBS 7.11)
OR -3201	Facility Operations and Maintenance - Def.	50RORNL711	Continuity of Operations
OR -3202	NFS Storage Project	50RORNL811	Waste Storage - Solid - ORNL TRU Waste - MW
		50RORNL852	NFS Storage (WBS 4.01)
OR -3203	Site Wide Activities - Defense	50RORNL786	Subtitle I USTS
OR -3204	General Plant Projects - Defense	50RORNL205	Ventilation System Upgrade (WBS 2.05)
		50RORNL207	Upgrade 3047 Filter House (WBS 2.07)
		50RORNL350	Manhole Monitors - Process Waste (WBS 3.50)
		50RORNL429	SWSA 6 Improvements (WBS 4.29)
		50RORNL437	Class III & IV Retrievable Stg Facility
		50RORNL439	CH-TRU Storage Facility (WBS 4.39)
		50RORNL440	SWSA 6 Staging Area Upgrade (WBS 4.40)
		50RORNL753	Continuity of Operations
		50RORNL756	Waste Treatment - WEAF Upgrade (WBS 4.23)
		50RORNL789	Continuity of Operations
		50RORNL797	Class III/IV Above Ground Storage (WBS 4.47)
		50RORNL814	Bulk Radiation Soil Disposal (WBS 4.24)
		50RORNL820	Contaminated Equipment Storage Facility
		50RORNL824	Pipeline Additions for FFA (WBS 3.16)
		50RORNL828	3039 Emergency Generator (WBS 2.03)
		50RORNL830	Support For FFA Compliance GPPS
		50RORNL847	Emerg Response Storage Fac Expansion
		50RORNL848	TRU Waste Storage Facility (WBS 4.04)
		50RORNL849	SLLW Staging Facility (WBS 4.06)
		50RORNL850	IWMF Upgrade (WBS 4.53)
		50RORNL851	Mixed Waste Storage Facility (WBS 4.63)
		50RORNL853	RH TRU Waste Storage Bunker (WBS 4.12)
		50RORNL854	Waste Operations Support Facility (WBS 4.46)
		50RORNL857	Bldg 3525 LLW FFA Upgrade (WBS 3.27)
		50RORNL858	FFA Compliance Bldg 3019A (WBS 3.28)
		50RORNL859	Pretreatment REDC LLW (WBS 4.54)
		50RORNL860	Class III/IV Below Ground Retr. Stor. Fac.
		50RORNL861	Hydraulic Head Measuring Stations (WBS 6.36)
		50RORNL862	NHF Filter Pit Upgrade (WBS 2.10)
		50RORNL866	Process Waste Flow Characterization
		50RORNL867	Contaminated Sump Pumping Mod (WBS 3.83)
		50RORNL872	Class III/IV Waste Storage (WBS 4.05)
		50RORNL878	Pretreatment FPDL (3517) (WBS 3.98)
OR -3205	Process Waste Treatment Plant	50RORNL831	Process Waste Treatment Plant
		50RORNL844	Waste Treatment Water PWTP (WBS 3.12)
OR -3206	FFA LLLW Tank Compliance	50RORNL793	LLLW Tank FFA Compliance
OR -3207	New Facility Planning - Defense	50RORNL413	Waste Handling & Packaging Plant (WHPP)
		50RORNL448	Waste Characterization & Cert Facility
		50RORNL714	Waste Characterization And Certification Fac.
		50RORNL790	Waste Treatment - Solid-LIP-WHPP & Support
		50RORNL791	Waste Treatment - Solid-LIP-WHPP & Support
		50RORNL792	Waste Treatment - Water-PWTP (WBS 3.36)
		50RORNL832	Melton Valley Storage Tanks Capacity Increase
		50RORNL833	Retrieved Cask Storage Bunker (WBS 4.44)
		50RORNL834	NPDES Permit Compliance Study
		50RORNL840	Retrieved Cask Storage Bunker (WBS 4.44)
		50RORNL841	Melton Valley Stor Tank Capacity Inc.
		50RORNL842	ORNL Process Waste Treatment Facility

ADS Number	Title	A-106 No.	A-106 Title
OR -3251	Facility Operations & Maintenance - Nondef.	5ORORNL400	Facility Operations & Maintenance Cap Equip.
OR -3253	General Plant Projects, WM, Nondefense	5ORORNL379	ORR/BSR/LLW Upgrade (WBS 3.79)
		5ORORNL380	Clean Water Act Compliance (WBS 3.80)
		5ORORNL421	Expand Mixed Waste Storage Capacity
		5ORORNL443	PCB/Hazardous Waste Storage, Bldg 7652
		5ORORNL630	Upgrade Hot Off-Gas Sys At 3039 Stack
		5ORORNL634	Waste Ops Control Center Expansion (WBS 6.34)
		5ORORNL798	Continuity of Operations
		5ORORNL803	Manhole Monitors Process Waste - 3000
		5ORORNL806	Continuity of Operations
		5ORORNL810	Process Waste Flow Monitors (WBS 3.92)
		5ORORNL813	Upgrade Block Fans Bldg. 3039 (WBS 2.12)
		5ORORNL816	NRWTP Access Controls (WBS 3.95)
		5ORORNL817	4500 Area LLW Upgrade (WBS 3.96)
		5ORORNL818	Cert & Seg of Newly Generated SW (WBS 4.38)
		5ORORNL823	FFA Compliance Work Bldg 3025 II (WBS 3.85)
		5ORORNL826	Upgrade Bldg 7507 Mixed Waste (WBS 4.30)
		5ORORNL855	Safety Improvement To 3042 (WBS 4.71)
		5ORORNL856	3000 Area LLW Upgrade (FFA) (WBS 3.02)
		5ORORNL863	Filter Pits Upgrade (WBS 2.29)
		5ORORNL864	3108 Filter Pit Enclosure (WBS 2.30)
		5ORORNL865	Outfall Dechlorination 6000/4508 (WBS 3.11)
		5ORORNL868	Outfall 302 Storm Sewer Rehab (WBS 3.91)
		5ORORNL869	Safety Improvements To 3001 (WBS 4.70)
		5ORORNL870	Surface Water Monitoring Improvements
		5ORORNL871	Wastewater Piping Replacement 4500s ORNL
		5ORORNL873	Safe Acc Impr Rad Waste Mgmt Area (WBS 3.06)
		5ORORNL874	Stack Monitoring Improvements (WBS 6.24)
		5ORORNL875	Chlorine Treatment For Cooling Water
OR -3254	New Facility Planning - Nondefense	5ORORNL835	Bethel Valley FFA Upgrade (WBS 3.31)
		5ORORNL836	Melton Valley LLLW Coll & Transfer Startup
		5ORORNL843	Bethel Valley FFA Upgrade (WBS 3.31)
OR -3255	Sanitary Waste System Upgrade	5ORORNL845	Sanitary Waste System Upgrade
OR -3301	ORNL WAG 1 Environmental Restoration	5ORORNL503	ORNL RI/FS Wag 1
OR -3302	ORNL WAG 2 Environmental Restoration	5ORORNL758	ORNL Wag 2 Environ Restoration
OR -3303	ORNL WAG 3 Environmental Restoration	5ORORNL759	ORNL Wag 3 Environ Restoration
OR -3304	ORNL WAG 4 Environmental Restoration	5ORORNL760	ORNL Wag 4 Environ Restoration
OR -3305	ORNL WAG 5 Environmental Restoration	5ORORNL761	ORNL Wag 5 Environ Restoration
OR -3306	ORNL WAG 6 Environmental Restoration	5ORORNL722	ORNL Wag 6 Environ Restoration
OR -3307	ORNL WAG 7 Environmental Restoration	5ORORNL762	ORNL Wag 7 Environ Restoration
OR -3308	ORNL WAG 8 Environmental Restoration	5ORORNL768	ORNL Wag 8 Environ Restoration
OR -3309	ORNL WAG 9 Environmental Restoration	5ORORNL763	ORNL Wag 9 Environ Restoration
OR -3310	ORNL WAG 10 Environmental Restoration	5ORORNL764	ORNL Wag 10 Environ Restoration
OR -3311	ORNL WAG 11 Environmental Restoration	5ORORNL765	ORNL Wag 11 Environ Restoration
OR -3312	ORNL WAG 13 Environmental Restoration	5ORORNL766	ORNL Wag 13 Environ Restoration
OR -3313	ORNL Inactive Liquid Low-Level Waste Tanks	5ORORNL736	ORNL Inactive LLLW Tank System
OR -3401	Landlord Operations	5ORORNL838	Subtitle I USTS
		5ORORNL877	Subtitle I USTS Capital Equipment
OR -3402	Sanitary Waste System Upgrade	5ORORNL839	Sanitary Waste System Upgrade
		5ORORNL846	Sanitary Sewage System Upgrade
OR -3701	ORNL Facilities Decontamination and Decomm.	5ORORNL745	Molten Salt Reactor Experiment Decomm.
		5ORORNL746	Metal Recovery Facility Decomm.
		5ORORNL774	Shielded Transfer Tanks Decomm.
		5ORORNL775	Orr Experimental Facilities Decomm.
		5ORORNL776	Fission Product Development Laboratory Decom.
		5ORORNL777	Homogeneous Reactor Experiment Decomm.
		5ORORNL778	Fission Product Pilot Plant Decomm.
		5ORORNL779	Waste Evaporator Facility Decomm.
		5ORORNL787	ORNL Facilities Decontamination & Decomm.
OR -4101	Sewage Collection System Rehabilitation, WM	2ORORGD156	Sewage Collection System Rehab

ADS Number	Title	A-106 No.	A-106 Title
OR -4102	Corrective Activities	20RORGD109	Toxicity Reduction (2/2)
OR -4103	General Plant Projects, CA	20RORGD068	Toxicity Reduction (1/2)
		20RORGD069	Sewage Collection System Rehab (1/2)
		20RORGD110	Sewage Collection System Rehab (2/2)
OR -4201	Facility Operations & Maintenance	20RORGD083	Facility Operations & Maintenance
		20RORGD115	Mixed Waste Storage Expansion Project
OR -4202	Site-Wide Activities	20RORGD087	Waste Minimization - MW
		20RORGD119	Waste Management Instrumentation & Equipment
OR -4203	Disposal/K-1515 San. Water Treat. PlantWaste	20RORGD141	Sanitary Water Plant Waste Disposal
OR -4204	TSCA Incinerator	20RORGD131	Toxic Substances Control Act Incinerator
OR -4206	General Plant Projects, WM, Defense	20RORGD152	General Plant Projects
		20RORGD153	GPP Project Management
OR -4207	New Facility Planning	20RORGD154	New Facility Planning
		20RORGD155	Project Planning and Management
OR -4301	Main Plant Area	20RORGD054	Remedial Invest/Feasibility Study-Main Plant
OR -4302	Process Plant Area Remedial Action	20RORGD055	Remedial Invest/Feasibility Study-Process
OR -4303	External Plant Area	20RORGD056	Remedial Invest/Feasibility Study-External
OR -5301	Support Facilities	5301	Support Facilities
OR -5302	Off-Site Groundwater Contamination	5302	Offsite Groundwater Contamination
OR -5303	WAGs 5 & 11	5303	Wag 5 & 11
OR -5304	WAGs 1 & 7	5304	Wag 1 & 7
OR -5305	WAG 13	5305	Wag 13
OR -5306	WAGs 8 & 9	5306	Wag 8 & 9
OR -5307	WAGs 12 & 15	5307	Wag 12 & 15
OR -5308	WAGs 10 & 16	5308	Wag 10 & 16
OR -5309	WAG 17	5309	Wag 17
OR -5310	WAG 18	5310	Wag 18
OR -5311	Groundwater Program	5311	Groundwater Programs
OR -5312	Underground Storage Tanks	5312	Underground Storage Tanks
OR -5313	WAGs 2,3, & 14	5313	Wag 2, 3, & 14
OR -5501	Program Management	5501	Program Management
OR -5701	Facility Decontamination and Decommissioning	5701	Facility Decontamination And Decommissioning
OR -6301-AA	Quadrant I RFI/CMS/CMI	20RPORT145	Quadrant I RFI/CMS/CMI
OR -6302-AA	Quadrant II RFI/CMS/CMI	20RPORT146	Quadrant II RFI/CMS/CMI
OR -6303-AA	Quadrant III RFI/CMS/CMI	20RPORT147	Quadrant III RFI/CMS/CMI
OR -6304-AA	Quadrant IV RFI/CMS/CMI	20RPORT148	Quadrant IV RFI/CMS/CMI
OR -6305-AA	Closures	20RPORT115	Closures
OR -6306-AA	Ground Water Protection Program	20RPORT144	Groundwater Protection Program
OR -6307-AA	Underground/Aboveground Storage Tanks	20RPORT060	Undergrnd Storage Tanks/Above Grnd Storage
OR -6308-AA	Other Consent Decree	20RPORT149	Other Consent Decree
OR -6309-AA	RCRA Closures	20RPORT150	RCRA Closures
OR -6701-AA	GCEP Termination, Surveillance and Maint.	20RPORT116	GCEP Termination
OR -6702-AA	Surplus Facilities Demolition	20RPORT130	Surplus Facilities Demolition
OR -7301	Project Integration	10RWSS7301	WSSRAP-Project Integration
OR -7302	Support Facilities	10RWSS7302	WSSRAP - Support Facilities
OR -7303	Quarry	10RWSS7303	WSSRAP - Quarry
OR -7304	Raffinate Pits	10RWSS7304	WSSRAP - Raffinate Pits
OR -7305	Chemical Plant	10RWSS7305	WSSRAP - Chemical Plant
OR -7306	Vicinity Properties	10RWSS7306	WSSRAP - Vicinity Properties
OR -7307	Disposal Facility	10RWSS7307	WSSRAP - Disposal Facility
OR -7308	Studies	10RWSS7308	WSSRAP - Studies
OR -8203	Reservation Support	20RORGD091	Central Facilities (Line Item) Planning
OR -8390	ORAU Remedial Investigation/Remedial Action	5ORORNL732	ORAU RI/FS
OR -9202	Low Level Waste Disposal Facilities	20RORGD092	Low-level Waste Disposal Facilities
OR -9203	OAK RIDGE Storage Facilities	20RORGD160	Oak Ridge Storage Facilities
OR -9302	Watts Bar Reservoir	20RORGD075	Off-Site Investigations
OR -9303	Non-FFA Projects	5ORORNL784	Non-FFA Offsite- CSX Site Characterization
OR -9304	East Fork Poplar Creek (EFPC)	10RY12141	East Fork Poplar Creek
RF -1001	OU 1 - 881 Hillside	RF1001	OU 1 - 881 Hillside
RF -1002	OU 2 - 903 Pad, Mound, and East Trenches	RF1002	OU 2 - 903 Pad, Mound, And East Trenches

ADS Number	Title	A-106 No.	A-106 Title
RF -1005	OU 5 - Woman Creek	RF1005	OU 5 - Woman Creek
RF -1006	OU 8 - 700 Area	RF1006	OU 8 - 700 Area
RF -1007	OU 12 - 400/800 Area	RF1007	OU 12 - 400/800 Area
RF -1008	OU 13 - 100 Area	RF1008	OU 13 - 100 Area
RF -1010	OU 14 - Radioactive Sites	RF1010	OU 14 - Radioactive Sites
RF -1011	OU 3 - Offsite Areas	RF1011	OU 3 - Offsite Areas
RF -1012	Sitewide Programs	RF1012	Sitewide Programs
RF -1014	OU 6 - Walnut Creek	RF1014	OU 6 - Walnut Creek
RF -1231	OU 10 - Other Outside Closures	RF1231	OU 10 - Other Outside Closures
RF -1251	OU 9 - Original Process Waste Lines (OPWL)	RF1251	OU 9 - Original Process Waste Lines (OPWL)
RF -1255	OU 7 - Present Landfill	RF1255	OU 7 - Present Landfill
RF -1258	OU 4 - Solar Ponds	RF1258	OU 4 - Solar Ponds
RF -1261	OU 11 - West Spray Field	RF1261	OU 11 - West Spray Field
RF -1263	Oxnard Facility	RF1263	Oxnard Facility
RF -1264	Onsite/Offsite Water Management	RF1264	Onsite/Offsite Water Management
RF -1271	Decontamination Facilities - ER	RF1271	Decontamination Facilities - ER
RF -1272	Waste Handling/Treatment Facilities - ER	RF1272	Waste Handling/treatment Facilities - ER
RF -3812	Program Control	TD3812.P13	Program Support For Compliance Activity
RF -3821	Facility Operations & Maintenance	TDD3821.03	Saltcrete Disposal
RF -3822	New Facilities Planning	TDD3822.F3	LLW Mixed Storage Facility
		TDD3822.F5	Residue Elimination Project
		TDD3822.F8	Sludge Immobilization System, Building 774
RF -3824	Corrective Activities	TDD3824.C1	Upgrade Radioactive Stack Sampling
		TDD3824.C2	Survey & Identify Existing NESHAPS Emissions
		TDD3824.C3	Saltcrete
RF -3826	Capital Projects	TD3826.CP2	Nitrate Salt Immobilization, Bldg. 374
		TD3826.CP3	Organic Process System, Bldg. 774
		TD3826.CP6	Steam Cleaning/Stripping
		TD3826.CP7	Sludge Immobilization System, Bldg. 776
		TD3826.CP8	Thermal Treatment Process Unit
		TD3826.CP9	Polymer Solidification
		T3826.CP10	Waste Cementation Upgrades, Bldg. 776
RF -3827	Sewage Treatment Plant	ADS3827	Sewage Treatment Plant
RF -3828	New Sanitary Landfill	ADS3828	New Sanitary Landfill
RF -3829	Building 374, Liquid Waste Treat. Fac. Upg.	ADS3829	Bldg. 374 Liquid Waste Treatment Facility
RL -1240-1	Vitrification	D-173-A	Hanford Waste Vitrification Plant (HWVP)
		D-173-B	Hanford Waste Vitrification Plant (HWVP)
		D-173-C	Hanford Waste Vitrification Plant (HWVP)
RL -1260-0	Facility Operations	W-004	B Plant AMU Area Upgrade
		W-107	B Plant Steam Condensate Treatment Ugrades
		W-108	B Plant Chem Effluent (BCE) Treatment Upgrade
		B-455	Wesf K-3 Filter System Upgrade
RL -2200-0	Solid Waste Storage and Disposal	W-156	Caisson Retrieval Facility
		W-196	Hazardous Waste Operations Loading Dock
		2200	Low-level Burial Ground Closure
		PERMIT-001	Permit/Waste Operations
		W-221	Phase 2 Waste Retrieval
		W-156	Remote-Handled TRU Retrieval
		W-025	RMW Disposal Facility (Nondrag Off)
		W-242	Solid Waste Thermal Treatment
		W-026	Waste Receiving And Processing Facility
RL -2200-1	Project W-112, Enhanced RMW Storage	W-112	Moderate Hazard Storage Facility
RL -2200-2	Project W-113, CH-TRU Retrieval	W-113	Waste Retrieval Facility
RL -2230-1	WRAP Module 2A	W-100	Wrap Facility Module 2
RL -2230-2	WRAP Module 2B	W-255	Waste Receiving And Processing Facility
RL -2310-1	Hanford Environmental Compliance (HEC)	HEC-W-049	200 Area Treated Effluent Disposal Facility
		HEC-L-045	300 Area Treated Effluent Disposal Facility
		HEC-W-024	B Plant Radiological And Containment Upgrades
		HEC-W-007	BCP Treatment Facility
		HEC-W-041	Environmental Hot Cell Expansion

ADS Number	Title	A-106 No.	A-106 Title
		HEC-C-018	242-A Evap/Purex Plant Condensate Treatment
		HEC-W-017	Groundwater Monitoring Wells Systems
		HEC-B-680	PFP Liquid Llw System Modifications
		HEC-C-031	PFP Liquid Effluent Treatment
		HEC-W-010	B Plant Environmental Compliance Upgrades
		HEC-W-016	Radioactive Mixed Waste Storage Facilities
		HEC-W-020	Waste Management Facilities Cathodic Prot.
		HEC-W-011	Waste Sampling And Characterization Facility
		HEC-W-020	Waste Management Facilities Cathodic Prot.
		HEC-W-011	Waste Sampling And Characterization Facility
RL -2320-0	Waste and Decontamination Services	W-XXX-	340 Secondary Containment/Leak Detection
		W-259	T-Plant Secondary Containment/Leak Detection
		C-253	T-Plant Waste Water Systems Modifications
RL -3000-0	SST Closures	RA-007	ER - 200 Area (SST) RFI/CMS
		RA-071	ER 200-PO-3 RI/FS
		RA-072	ER 200-TP-6 RI/FS
RL -3010-0	RARA/USTs	RA-010	ER - Radiaction Area Reduction EJ
		RA-037	Inactive Underground Storage Tanks
RL -3020-0	RCRA Closures	RA-053	216-A-10 Crib Closure
		RA-052	216-A-368 Crib Closure
		D/D-011	Closure Of 183-H Basins
		RA-046	ER-216-U-12 Crib Closure/Post Closure Plan
		RA-034	ER-300 Area Process Trenches
		RA-035	ER-B-Pond and A-29 Ditch Intrim, RA
		RA-036	ER-NRDWL Closure
RL -3100-0	100 DR Char., Assess. and Remedial Action	RA-058	ER 100-DR-3 RI/FS
		RA-028	ER-100-DR-1 RFA/CMS
		RA-031	ER-100-DR-2 RI/FS
		RA-018	ER-100-KR-1 RI/FS
RL -3105-0	100 BC Char., Assess. and Remedial Action	RA-056	ER 100-BC-4 RI/FS
		RA-057	ER 100-IU-1 RI/FS
		RA-055	ER 100-BC-3 RI/FS
		RA-016	ER-100-BC-1 RI/FS
		RA-022	ER-100-BC-2 RI/FS
		RA-017	ER-100-BC-5 RI/FS
RL -3110-0	100 KR Char., Assess. and Remedial Action	RA-063	ER 100-KR-3 RI/FS
		RA-025	ER-100-KR-2 RI/FS
		RA-019	ER-100-KR-4 RI/FS
RL -3115-0	100 FR Char., Assess. and Remedial Action	RA-060	ER 100 FR-2-RI/FS
		RA-061	ER 100-IU-3 RI/FS
		RA-062	ER 100-FR-3 RI/FS
		RA-020	ER-100-FR-1 RI/FS
RL -3120-0	100 HR Char., Assess. and Remedial Action	RA-059	ER 100-HR-2 RI/FS
		RA-026	ER-100-HR-1 RFI/CMS
		RA-027	ER-100-HR-3 RFI/CMS
RL -3125-0	100 NR Char., Assess. and Remedial Action	RA-029	ER-100-NR-1 RFI/CMS
		RA-041	ER-100-NR-2 RI/FS
RL -3200-0	200 BP Char., Assess. and Remedial Action	RA-015	ER-200-BP-1 RI/FS
		RA-042	ER-200-BP-11 RI/FS
		RA-045	ER-200-BP-2 RI/FS
		RA-032	ER-200-BP-4 RFI/CMS
		RA-023	ER-200-BP-5 RI/FS
RL -3210-0	200 PO Characterization and Assessment	RA-065	ER 200-PO-1 RI/FS
		RA-066	ER 200-PO-4 RI/FS
		RA-043	ER-200-PO-2 RI/FS
		RA-044	ER-200-PO-5 RI/FS
RL -3220-0	200 SO Characterization and Assessment	RA-067	ER 200-SO-1 RI/FS
RL -3225-0	200 TP Characterization and Assessment	RA-068	ER 200-TP-2 RI/FS
		RA-039	ER-200-TP-1 RI/FS
		RA-040	ER-200-TP-4 RI/FS

ADS Number	Title	A-106 No.	A-106 Title
RL -3230-0	200 UP Characterization and Assessment	RA-021	ER-200-UP-2 RI/FS
RL -3235-0	200 ZP Char., Assess. and Remedial Action	RA-069	ER-200-ZP-2 RI/FS
		RA-024	ER-200-ZP-1 RI/FS
RL -3240-0	200 IU Characterization and Assessment	RA-064	ER-200-IU-3 RI/FS
RL -3300-0	300 FF Char., Assess. and Remedial Action	RA-070	ER-300-FF-2 RI/FS
		RA-013	ER-300-FF-1 RI/FS
		RA-038	ER-300-FF-3 RI/FS
		RA-014	ER-300-FF-5 RI/FS
RL -3390-0	1100 EM Char., Assess. and Remedial Action	RA-012	ER-1100-EM-1 RI/FS
RL -3400-0	Program Management Support Remedial Actions	RA-011	ER-Eqpt and Facility Upgrades
		RA-008	ER-Technology Support RI/FS and NEPA Support
		RA-002	ER- ER Planning
RL -3410-0	Program Management Support Decont & Decomm	D/D-016	Hanford Site D&d Management/Administration
RL -3500-0	Asbestos Abatement	D/D-017	Asbestos Abatement
RL -3510-0	100 Area D&D	D/D-005	Decommissioning 100 Area Reactors GE/GF
		D/D-006	Decommissioning 100 Area Effluents - GF
		D/D-007	Decommissioning 100 Area Ancillaries - GF
		D/D-013	100/200/300 Areas Cleanup of Excess Support
RL -3520-0	200 Area D&D	D/D-012	232-Z Waste Incineration Facility D&D
		D/D-010	233-S Plutonium Concentration Facility D&D
		D/D-002	Decommissioning Of Strontium Semiworks
		D/D-003	Decommissioning Of 224-B Facility
RL -3700-0	Disposal Facility	RA-073	Disposal Facility
RL -4100-0	Program and Environmental Management	C-027	211-T Chemical Storage Area
		PERMIT-002	Permits/Chemical Processing
RL -4110-0	K Basin Operations Program	PERMIT-003	Regulatory Response/N/K/300 Fuels
RL -4120-0	N Reactor Program	N-3003	UST Removal/N Reactor
		N-3009	Air Monitoring Installation/N Reactor
		PERMIT-003	Regulatory Response/N/K/300 Fuels
RL -4150-0	300 Area Fuel Supply Program	PERMIT-003	Regulatory Response/N/K/300 Fuels
RL -4170-0	PFP	C-116	PFP Waste Disposal
RL -4200-0	FFTF Plant	PERMIT-004	Permit - 004
RL -4210-0	Program and Environmental Management	PERMIT-004	Liquid Metal Reactor Program Permit
RL -7200-0	General Admin Support/Buildings	L-092	2751E, 2752E, 2753E, Emergency Drain Field
		L-116	200 Area Sanitary Sewer System
		L-092	2751E, 2752E, 2753E, Emergency Drain Field
		L-028	Petroleum Bulk Plant Upgrade
		B-697	Laundry Facility Effluent Treatment
		D-387	Laboratory Addition, 318 Building
		D-392	Refrigerated Air Conditioning, 325 Building
		D-404	Radionuclide Liquid Effluent Monitors
		D-405	Nonradioactive Liquid Effluent Monitors
		D-406	Radiological Exhaust Air Sampling
		D-408	Environmental Upgrades
		D-XXX-02	Work Place Air Monitoring
		D-XXX-04	Work Place Air Monitoring
		L-059	300 Area Ash Pond Replacement
		92L-063	Solid Waste Transfer Station
RL -7205-1	92-L-017, 200 East Steam System Rehab, PH II	92-D-186	200 East Steam System Rehab Ph II
RL -7205-2	90-B-503, Decon Laundry Facility	90-D-174	Decontamination Laundry Facility
RL -7205-4	94-L-070, 300 Area Process Sewer Piping Sys.	94-D-412	300 Area Process Sewer Piping System Upgrade
RL -7210-1	92-L-044, Hanford Infrastruct., Undrgrnd Stg	92-D-184	Infrastructure Underground Storage Tanks
RL -7225-1	95-D-424, 324 Facility Compliance/Renovation	D-424	324 Facility Compliance/Renovation
RL -7225-2	94-D-391, 325 Facility Compliance/Renovation	93-D-184	325 Facility Compliance/Renovation
SF -1002	Program Support	LLWL-015	Compliance Stock Monitoring
SF -1004	Program Support	SF-1004	Permits - Relocate High Explosive Burn Fac.
SF -1482-11	Soil and Groundwater - Environmental Assess.	SSFL 018	Environ Monitoring Fac
SF -1482-12	Closure Hazardous Waste Handling Facility	SSFLBL0039	Waste Handling Fac Closure
SF -1483-10-SG	Soil and Groundwater Char. & Remediation	ER3016AA	Environ Restoration Assess Program
		ER3023AA	Master Substation PCB Remediation

ADS Number	Title	A-106 No.	A-106 Title
SF -1488-10	Area IV - Remedial Action	4009-AB	SSFL Groundwater Cleanup
SF -1488-20	ETEC D & D	4000-AA	SCT1 Waste Water Disposal System
		4002-AA	Secondary Containment
		4003-AA	Bldg. 059 D&D
		4005-AB	RMDF Assessments
		4005-AC	RMDF D&D
		4006-AB	SSFL Work Area Assessments
		4006-AC	SSFL Work Area Decontamination
		5000-AA	Sodium Disposal Facility Assessment
		5000-AB	Sodium Disposal Facility Cleanup
		5001-AA	Bldg. 005 Assessments
		5001-AB	Bldg. 005 D&D
		1488-20	Bldg 023 Assessments
		5002-AC	Bldg. 023 D&D
		5003-AA	D&D of Rockwell International Hot Lab
SF -2002	Program Support	SF 2002	Toxic Air Releases Assess & Fac Rehab
SF -2006	Program Support	SSFLBL0035	Sanitary Sewer Chem Discharge Monitors
SF -2011	Program Support	SF-2011	Undergrnd Tank Monitoring & Removal Phase 2
SD -3914	Waste Minimization Management	SSFLBL0017	Waste Minimization
SF -3931	Facility Operations & Maintenance (WM)	SF-3931-T	Di Regeneration Equip Controls
SF -3934	Hazardous Waste Handling Facility	SF-3934	Hazardous Waste Handling Facility
SF -3945	Sewer Pipe Rehabilitation	SF-3945	Sewer Improvement
SF -4007-AA	Program Support	4007-AA	Corrective Actions At Permitted Facilities
SR - 25-LI	New Facility Planning - DWPF	SR-25-06	Failed Equip Storage Vaults -DWPF
		SR-25-16	Glass Waste Storage Fac Bldg
		SR-25-36	Salt Cell Benzene Abatement
SR - 26-LI	DWPF Line Item 81-T-105	SR-26-LI	Defense Waste Processing Facility
SR - 32-AA	H-Tank Farm	SR-32-CAH	Isokinetic Sampler Upgrades - H Area
		SR-32CA001	Constant Air Monitors, F&H Area
SR - 33-AA	F-Tank Farm	SR-33-CAF	Isokinetic Sampler Upgrades - F Area
SR - 35-AA	Effluent Treatment Facility	SR-35-AA33	SRL Liquid Processes
		SR-35CA	Effluent Treatment Facility - CE
		SR-35-AA32	ETF R&D
SR - 37-GP	General Plant Projecte-Liquid Waste	SR-37G	Effluent Treatment Facility Projects
SR - 38-LI	New Facility Planning-Liquid Waste	SR-38-56	Tank Farm Storm Water Control
		SR-38-66	Storm Water Monitoring Upgrades
		SR-38-46	ETF Oxidation Removal Facility
		SR-38-36	ITP Benzene Abatement
		SR-38-01	Process Sewer
SR - 39-LI	New Waste Transfer Facility	SR-39-LI	New Waste Transfer Fac
SR - 42-AA	Solid Waste Storage and Disposal	SR-42-28	Haz/mixed Waste Disposal Vaults
SR - 43-GP	General Plant Projects-Solid Waste	SR-43G	Solid Waste Disposal Fac - GPP
		SR-43G-TRU	Tru Pads & Enclosures, SWDF
SR - 44-LI	New Facility Planning-Solid Waste	SR-44-56	High Activity TRU Facility (HATF)
		SR-44-26	Waste Prep Fac Support & Operation
		SR-44-630	Waste Characterization Lab, 772-H
SR - 45-LI	Consolidated Incineration Facility	SR-45-LI	Consolidated Incinerator Fac (cif) Support
		SR-45-LI	Nonradioactive Haz Waste
SR - 46-LI	Burial Ground Expansion	SR-46-LI	Nonradioactive Haz Waste
		SR-46-LI	Solid Waste Disposal
SR - 47-LI	M-Area Waste Disposal	SR-47-LI	Y-M-Area Waste Disposal
SR - 48-LI	Hazardous Waste/Mixed Waste Disposal Fac.	SR-48-LI	Haz Waste/mixed Waste Disposal
SR - 49-LI	Transuranic Waste Facility	SR-49-LI	Transuranic Waste Fac
SR - 310-LI	Replacement HLW Evaporator	SR-310-LI	Replacement High Level Waste Evaporator
SR - 311-LI	Diversion Box & Pump Pit Containment	SR-311-LI	Diversion Box & Pump Pit Containment
SR - 312-LI	Hazardous LLW Processing Tanks	SR-312-LI	Haz Low Level Waste Processing Tanks
SR - 313-LI	Inter Area Line Upgrade	SR-313-LI	Interarea Line Upgrade
SR - 314-LI	HLW Removal from Filled Waste Tanks	SR-314-LI	High Level Waste Removal From Filled Tanks
SR - 408-D	Waste Transfer	SR0408D	Waste Transfer
SR - 410-LI	New Sanitary Landfill	SR-410-LI	New Sanitary Landfill

ADS Number	Title	A-106 No.	A-106 Title
SR - 501-AA	SRL & TNX Basins	SR-501-AA	SRL & TNX Basins
SR - 502-AA	Coal Pile Runoff & Ash Basins	SR-502-AA	Coal Pile Runoff & Ash Basins
SR - 503-AA	Acid/Caustic Basins	SR-503-AA	Acid/caustic Basins
SR - 504-AA	Oil & Chemical Basins	SR-504-AA	Oil & Chemical Basins
SR - 505-AA	Reactor Basins	SR-505-AA	Reactor Basins
SR - 506-AA	Separations Basins	SR-506-AA	Separations Basins
SR - 507-AA	Basin Sewer Lines	SR-507-AA	Basins Sewer Lines
SR - 508-AA	Burning Pits	SR-508-AA	Burning Pits
SR - 509-AA	Rubble Pits & Piles	SR-509-AA	Rubble Pits & Piles
SR - 510-AA	Radioactive Burial Grounds	SR-510-AA	Radioactive Burial Grounds
SR - 511-AA	Non Radioactive Burial Grounds	SR-511-AA	Non-Radioactive Burial Grounds
SR - 512-AA	Storage Tanks	SR-512-AA	Minimal Action Units
SR - 514-AA	Reactor Areas Groundwater	SR-514-AA	Reactor Area Groundwater
SR - 515-AA	200 Area Groundwater	SR-515-AA	200 Area Groundwater
SR - 516-AA	3/700 Area Groundwater	SR-516-AA	3/700 Area Groundwater
SR - 517-AA	400 Area Groundwater	SR-517-AA	400 Area Groundwater
SR - 518-AA	600 Area Groundwater	SR-518-AA	600 Area Groundwater
SR - 601-AA	R Reactor D&D	SR-601-AA	R Reactor
SR - 602-AA	232-F Tritium D&D	SR-602-AA	233-F Tritium D&D
SR - 603-AA	235-F PuFF D&D	SR-603-AA	235-F Puff D&D
SR - 606-AA	SED I & SED II D&D	SR-606-AA	SED I & SED II D&D
SR - 607-AA	412-D Heavy Water Facility D&D	SR-607-AA	412-D Heavy Water Fac D&D
SR - 608-AA	HWCTR D&D	SR-608-AA	HWCTR D&D
SR - 609-AA	Ford Building D&D	SR-609-AA	Ford Bldg D&D

APPENDIX I

Key EM Planning Documents and Inputs

Document	Purpose and Scope	Relationship to Other Planning Documents
Activity Data Sheet (ADSs)	Basic planning data that describe EM activities by site. Used in development of Five-Year Plan and EM budget. Also forms reporting basis in the Progress Tracking System. ADSs include scope of work, costs, schedules for each activity, regulatory drivers and milestones. ADSs are developed annually by Field Offices and finalized by joint Headquarter/Field review process. All activities identified for funding under the EM program are described by ADSs. State and Federal regulators, Office of Management and Budget, Congress, general public, and other interested parties review completed ADSs.	Basis for Five-Year Plan, Site-Specific Plans, and other aspects of EM planning.
Budget Activities [Internal Review Budget (IRB) and Office of Management and Budget (OMB) budget process]	To prepare the EM program budgets for DOE, OMB and Congressional review. Budget prepared annually in two-step process: (1) IRB for internal DOE review in the summer, and (2) external OMB review in the fall. The budget is then submitted to Congress by the President the following January.	Activity Data Sheet preparation for the Five-Year Plan forms the starting point for the IRB preparation.
Defense Authorization Act for FY 1992–1993 (P.L. 102-190) Section 3135	Section 3135 mandates a Five-Year Plan for Environmental Restoration and Waste Management activities of DOE nuclear facilities.	Drives Five-Year Plan content and production schedule. Also requires production of EM preliminary and final version with formal public comment periods.
DOE Orders 2250.1C, 4700.1, 5820.2A	Issued by the Secretary of Energy; establish policies and guidelines for management of DOE nuclear facilities, including cost and scheduling criteria and requirements for outlay program acquisitions.	Drive ADS and Five-Year Plan estimates and activity descriptions, as well as other management initiatives discussed in the plan.
Final Report on DOE Nuclear Facilities by the Advisory Committee on Nuclear Facility Safety (Ahearne Committee)	Assesses the DOE nuclear complex and presents recommendations to the Secretary on critical DOE-wide issues. The Committee highlighted nine issue areas: Risk Analysis, Research Reactors, Process Facilities, Environmental Cleanup, Radiation Protection, Rocky Flats Plant, Waste Isolation Pilot Plant, Safety Policy, and Other Activities.	Contributed to the development of land-use planning and risk management initiatives articulated in FY 1994–1998 Five-Year Plan.

Document	Purpose and Scope	Relationship to Other Planning Documents
EM Five-Year Plan	EM's primary planning tool for regulatory compliance, waste management, environmental cleanup, and technology development activities at DOE sites. Provides a detailed description of the EM program for internal and external goals, objectives, strategies, plans and accomplishments. The Five-Year Plan is produced annually. It presents EM's Strategic Plan; describes Environmental Restoration, Waste Management, Technology Development, Facility Transition, and Transportation program plans and accomplishments; and summarizes EM activities at the installation level. The plan presents financial data compiled from the Activity Data Sheets for the execution, budget and planning year, and for the four following years.	The Five-Year Plan is supported by Activity Data Sheets, which are evaluated by independent cost reviews. Roadmaps at the installation level form the general framework for more detailed five-year planning. Program baselining and priorization activities feed into the Five-Year Plan. The Five-Year Plan acts as a basis for Site-Specific Plans, which give further details for each installation. The Five-Year Plan receives extensive input from a number of sources: internal EM and DOE programs, State and Federal regulators, OMB, Congress, the general public, and other organizations and affected parties.
EM/Office of Environmental Safety and Health (EH) Memorandum of Understanding	To delineate the respective roles of the two organizations and to specify areas of interrelationship. The EM/EH Memorandum of Understanding is currently under development. EH is working on a draft version to be used as a source of negotiation. When completed, it will specify clear lines of authority.	MOU will reconcile overlapping planning activities in EM and EH.
Program Management Plans	Establish requirements, procedures, and systems by which program missions will be accomplished. Include activities of Headquarters program staff and support contractors.	Implementation documents for site-level activities.
Programmatic Environmental Impact Statement (PEIS)	The PEIS will analyze reasonable alternatives to siting DOE waste management facilities and will describe related environmental impacts. Based on this analysis, changes may be made to future site projects and activities. Public input provided through scoping meetings and workshops. An EM Advisory Committee will review draft PEIS.	Results from PEIS process will directly affect scope of Five-Year Plan as well as scope of activities at specific DOE installations.
Progress Tracking System (PTS)	To maintain system for reporting EM cost, schedule and technical progress in a way that can be linked to planned activities as presented in the Five-Year Plan. All activites funded by EM are reported through the PTS. The PTS is the primary EM system for monthly status reporting. Reports are submitted monthly at the Activity Data Sheet or Technical Task Plan level through the Field Offices. They contain information on planned costs, planned milestones, and their status.	The PTS reports on activities described in the Activity Data Sheets which back up the Five-Year Plan for Environmental Restoration and Waste Management Programs. Budgets for these activities are revised through the IRB and OMB process and set through the Approved Funding Plan. For the Technology Development Program, the Technical Activity Data Sheets presented in the Five-Year Plan are further defined into component Technical Task Plans during the budgeting year.

Document	Purpose and Scope	Relationship to Other Planning Documents
Roadmaps	Help managers respond to critical environmental, health, and safety issues at DOE sites. Identify issues or obstacles that might impede EM progress and develop strategies for resolution. Scope ranges from site-specific waste stream issues to crosscutting policy questions.	Roadmaps set the context for planning activities and feed national program planning, such as technical development, transportation or waste-stream planning. Issues and strategies identified by roadmaps are incorporated into the Five-Year Plan.
Remedial Action Assessment System (RAAS)	Develops and tests a computer-based methodology for identifying, linking and evaluating technologies for DOE sites. The methodolgy is being developed to standardize and compress the remedial investigation/feasibility study process.	Once fully developed, RAAS would be a key tool in the development of the Environmental Restoration Program baselines and project plans.
EM Safety and Health Five-Year Plan	Identifies and prioritizes EM-wide Safety and Health activities. Combined with similar plans from other programs, will form the DOE-wide Safety and Health Five-Year Plan.	For EM, safety and health data is a subset of the EM Activity Data Sheets. EM will discuss EM's portion of the DOE Safety and Health Five-Year Plan in EM's Five-Year Plan.
Secretary of Energy Notice 25A "Strategic Planning Initiative"	Integrates planning, programming and budgeting in a functional manner. Mandates six products that collectively underpin the yearly planning process; Strategic plans; guidance to the field; multi-year program plans; crosscut plans (as assigned); program issues; program planning proposals.	Provides policy framework for all EM planning activities; EM Five-Year Plan satisfies SEN 25A planning requirements.
Site-Specific Plans (SSPs)	Provide details on activities, milestones, accomplishments, and funding requirements for each site. Focuses on execution year activities. Prepared annually by Field Offices;submitted to Headquarters for review.	Linked to Five-Year Plan, ADSs, and PTS. The EM Integrated Planning Process will tie SSPs to Strategic Plans.
EM Strategic Plan	Develops EM-wide strategic objectives; establishes EM long-term vision and mission; outlines strategies for addressing issues and meeting goals. Describes the framework for subsequent planning efforts at the Headquarters and installation levels. Prepared annually with input from Headquarters, Field Offices, and other Program Secretarial Officers.	Sets overarching policy framework for all EM planning and is responsive to DOE-wide planning requirements set by SEN-25A-91 (Strategic Planning Initiative); provides direction for preparation of Five-Year Plan (especially Section I of FY 1994-1998 Five-Year Plan). Roadmaps constitute a critical input to the annually-updated EM Strategic Plan.

APPENDIX J
STATE AND TRIBAL GOVERNMENT WORKING GROUP AND STAKEHOLDERS' FORUM COMMENTS ON PREDECISIONAL DRAFTS

Introduction

The Predecisional Draft of the FY 1994–1998 Environmental Restoration and Waste Management Five-Year Plan has undergone a series of extensive reviews by both internal DOE programs and external organizations. Based largely upon the comments and suggestions made by these groups, the plan has been significantly revised and restructured, with resulting improvements in content, style, and utility.

Internal DOE organizations that reviewed and commented on the draft Five-Year Plan include the Office of Environment, Safety, and Health; the Office of General Counsel; the Office of Fossil Energy; the Office of Public Affairs; and the Office of Defense Programs. The draft was also reviewed across the EM Program, including the four Program Offices (Waste Management, Environmental Restoration, Technology Development, Facility Transition), and by the Field Offices.

The two external groups that participated in reviewing the document were the State and Tribal Government Working Group (STGWG) and the Stakeholders' Forum. STGWG, which meets approximately four times a year, is comprised of participants from 17 States, five Indian Tribes, three associations representing State interests, and the Office of Management and Budget. The Stakeholder's Forum meets on an annual basis and is comprised of interested parties representing Congress, trade unions, other Federal agencies, Tribal organizations, education associations, environment and public interest groups, professional and technical societies, and industry. Both STGWG meetings and the Stakeholder's Forum provide open settings where participants can address their concerns directly to DOE managers and effect significant changes to the Five-Year Plan while it is still a predecisional draft. DOE has worked closely with these groups in developing previous Five-Year Plans and has come to rely on their early, substantive involvement in its planning process.

STGWG met on June 8–10, 1992, in Denver, Colorado, to discuss an early (May) draft of the FY 1994–1998 Five-Year Plan. The group also met on December 17–18, 1992, in Washington, D.C., where they submitted comments on the subsequent (December) draft of the plan. The Stakeholders' Forum also met in June of 1992, in Arlington, Virginia, to review the May draft of the Five-Year Plan and convey their comments and concerns. In addition to comments received at each of these meetings, DOE received written comments from members of both groups.

This appendix is divided into two sections: the first summarizes the comments made by STGWG on the December draft of the Five-Year Plan and discusses how this plan addresses these comments; the second section discusses comments made by both STGWG and the Stakeholder's Forum on the May draft of the plan.

STGWG Comments on the December Draft

The December draft of the FY 1994–1998 Five-Year Plan received a number of substantive comments at the December STGWG meeting. Several STGWG members expressed satisfaction that their suggested revisions to the May draft were incorporated. Others noted that the overall size and structure of the document were much improved. Concerns with the plan were specific in nature, but generally fell within the following categories:

- The need for DOE to produce the Five-Year Plan in accordance with specific requirements of the National Defense Authorization Act for FY 1992 and FY 1993.
- A reduced emphasis in the plan on the "culture change" within DOE (and the lack of evidence of such a change throughout the DOE complex).
- A need for better definition and discussion of Indian roles/rights.
- Technology development issues.
- Update/clarification of Installation Summary discussions.
- Pollution prevention/waste minimization issues.
- Public involvement in cleanup decisions.

The National Defense Authorization Act for FY 1992 and FY 1993

One of the primary concerns expressed by STGWG members was that DOE violated the National Defense Authorization Act by not releasing the FY 1994–1998 Five-Year Plan in accordance with the schedule outlined in that act. Commenters requested that DOE account for delays in release of the plan and describe the steps it is taking to ensure that the next Five-Year Plan conforms to the requirements of the act.

DOE understands that it is accountable for producing the EM Five-Year Plan according to the provisions of the National Defense Authorization Act. DOE also realizes the importance of releasing the plan in a timely manner so that the information it contains is accurate and of use to interested and affected parties. Unfortunately, release of the FY 1994–1988 Five-Year Plan was delayed due to cost reviews, prolonged interagency review, and other unforeseen events. In addition, DOE believes it is essential that STGWG and the Stakeholders' Forum have opportunity to comment on the predecisional draft of the plan. The Five-Year Plan development schedule therefore included time to incorporate this critical external input.

Despite this year's delays, DOE will continue to strive to meet the requirements of the National Defense Authorization Act. The schedule for development of the FY 1995–1999 Five-Year Plan is designed to accommodate both internal and external reviews and also to meet the release date specified by Congress.

Culture Change at DOE

Another concern expressed by participants at the December STGWG meeting was that the Five-Year Plan included little discussion of the culture change taking place throughout DOE — a change from the closed, top secret nature of weapons production to a culture of openness and accountability in environmental cleanup efforts. Commenters were not only concerned that this change, emphasized in earlier Five-Year Plans, was rarely mentioned in the FY 1994–1998 Five-Year Plan, but they also felt that DOE Field Offices and sites have not fully demonstrated that this change has actually taken place.

Instituting a culture change throughout an organization of DOE's size and complexity is necessarily a lengthy process, and the plan may understate the complexity of this challenge. A great deal of progress has been made in opening up DOE operations and activities to public scrutiny, though there is still work to be done in this regard. The entire EM organization reflects DOE's ongoing efforts to instill this culture change throughout the weapons complex. Since its creation in 1989, EM has considered substantive public involvement an essential element of its cleanup efforts, and successive Five-Year Plans have documented efforts to improve public participation opportunities. For example, this year's plan demonstrates the importance of external involvement by discussing the new EM Office of Policy and Program Information, which is responsible for coordinating EM-wide participation efforts.

Indian/Tribal Roles and Rights

There were a number of comments regarding discussion of Indian issues throughout the Five-Year Plan, particularly the need for DOE to expand its efforts to involve Indian tribes in all stages of planning. Specifically, commenters urged DOE to incorporate Indian treaty rights in its land-use planning strategies and in its efforts to transition surplus sites and facilities. Several commenters also expressed concern over DOE's American Indian Policy, calling the policy inadequate.

Protecting Indian treaty rights has been, and will continue to be, of primary importance to DOE. The Department strives to work closely with all affected tribes in developing and carrying out cleanup strategies. As such, DOE efforts to incorporate facility transition and land-use planning activities into the EM cleanup effort will rely heavily on input and suggestions from affected Tribes. These planning initiatives have only recently been introduced into EM planning and will not be implemented fully without consultation with all affected parties.

Although several STGWG members have expressed concern with DOE's American Indian Policy, it is important to emphasize that there will be significant opportunities for Tribal involvement in developing the Implementation Plan for this policy. DOE has convened a working group on Indian issues that draws membership from all major EM programs and Field Offices. The primary, immediate task of this group is to address a number of critical issues, including: improving internal DOE communication on matters affecting Tribal rights and policies; determining criteria upon which to base financial and technical assistance to Tribes; and establishing a process for complying with laws regarding cultural resource management. DOE will look to tribal leaders to help resolve these issues and in implementing the DOE American Indian Policy.

Technology Development

A number of suggestions were made by STGWG members concerning technology development issues. One commenter wanted the Five-Year Plan to discuss EM efforts to coordinate with other DOE groups that work with the private sector on technology transfer issues. Another commenter asked DOE to acknowledge that other programs, such as EPA's Superfund, have already developed many technologies that could be used in DOE's cleanup efforts. Other related comments stressed the importance of involving Tribal representatives in transportation issues.

DOE agrees that the Five-Year Plan should include further discussion of EM technology transfer issues. The Five-Year Plan has been revised to reflect discussion of DOE's Technology Transfer Planning Group, which coordinates individual technology transfer programs and policies in order to reduce overlap among DOE programs. Discussion in the Five-Year Plan has also been revised to emphasize DOE's awareness of parallel technology development efforts that might have applicability within the EM cleanup program.

DOE further agrees that Tribal representation in transportation issues is critical to overall success. As discussed in the plan, DOE continues to work closely with affected Tribes and States, through such groups as the Transportation Emergency Preparedness Program External Coordination Working Group, in decisions regarding the transportation of DOE wastes across Tribal lands and territories.

Installation Summaries

Several STGWG members requsted that information contained in specific installation summaries be clarified and updated. One commenter noted that Congress recently made a land withdrawal decision at the Waste Isolation Pilot Plant and asked that the WIPP summary be updated to reflect this. As a result, discussion of WIPP has been updated throughout the Five-Year Plan to reflect the recent WIPP Withdrawal Act.

Based on other STGWG comments, DOE has revised a number of installation summaries. Suggested changes to the strategic outlook, milestones, and progress charts were incorporated into the Paducah, Portsmouth, Mound, and Nevada Test Site Installation Summaries.

Pollution Prevention/Waste Minimization

Although one commenter stated that DOE's commitment to waste minimization and pollution prevention is a noted improvement (over last year's plan), a number of commenters were interested in seeing even more discussion of DOE's efforts in this area. One STGWG member stated that Section 1.6.6, "Preventing Pollution at its Source," should specifically mention waste minimization as an important factor in the evaluation of removal and remediation technologies. Another commenter asked for clarification of the role and authority of the Waste Reduction Steering Committee.

The discussion of pollution prevention has been expanded in this Five-Year Plan to reflect STGWG comments. DOE agrees that waste minimization is an important factor in the evaluation of removal and remediation technologies and has revised Section 1.6.6 to reflect this. In addition, the Waste Reduction Steering Committee's role in providing uniform program direction and promoting information sharing has been clarified in the Five-Year Plan.

Public Involvement

There were a number of comments made by STGWG members concerning DOE's interaction with states, Tribes, and the general public. One commenter felt that DOE efforts to include the public in issues relating to development of national risk levels for cleanup are inadequate. Another commenter requested that DOE make a firm commitment to consult adjacent communities and jurisdictions before moving to address off-site contamination problems. A third commenter stated that the public participation program at the Fernald site has been successful and should be referenced in the Five-Year Plan as an example for other sites.

As stated in this appendix and throughout the Five-Year Plan, DOE firmly believes in directly involving all affected groups and individuals in its efforts to clean up the weapons complex. The Department has a number of mechanisms in place — at the national and site level — through which its solicits and encourages input from interested parties regarding DOE planning documents and initiatives, such as national risk-based standards. DOE understands the importance of obtaining consensus on these critical issues and will continue to work with the public in developing methods for resolving them.

DOE agrees that the Fernald public participation program should be highlighted in the Five-Year Plan as an example of a successful public involvement effort and has added a discussion of it in the Executive Summary and in Section I.

STGWG and Stakeholders' Forum Comments on the May Draft

Overall, Stakeholder and STGWG comments on the Predecisional FY 1994–1998 Five-Year Plan were favorable. Both groups acknowledged significant improvements over the FY 1993–1997 Five-Year Plan, many of which were based on previous STGWG/Stakeholder recommendations. However, there was also a number of areas that both groups agreed could be improved through clarification or further discussion. Generally, STGWG and Stakeholder comments can be broken down into the following categories:

- Worker Health and Safety
- Education and Training
- Public Involvement
- Cost Estimates
- Research and Technology Development
- Transition Issues
- Risk-Based Management
- Land-Use Planning
- Waste Minimization
- Five-Year Plan Structure and Organization
- Installation Summaries/Site-Specific Issues

This appendix summarizes the concerns expressed by Stakeholders' Forum and STGWG members—both at the June 1992 meetings and through letters and correspondence received through June 29, 1992—and discusses how the final draft of the Five-Year Plan addresses these comments.

Worker Health and Safety

Many STGWG and Stakeholders' Forum participants urged that the Five-Year Plan devote more discussion to the issue of worker health and safety. Specifically, comments recommended that the plan provide more detail on worker health and safety training for EM personnel. It was also suggested that the plan detail the specific enforcement procedures that DOE follows in ensuring worker protection. Comments also referred to Figure 1.4b, noting that it was unclear and did not correspond to the written text.

As discussed throughout the Five-Year Plan, worker health and safety are of primary importance to EM. This is emphasized by the development this year of the first EM Safety and Health Five-Year Plan. This plan, which is summarized in the Five-Year Plan (Section 1.6.9), addresses DOE-wide strategies, programs and priorities to reduce and manage health and safety risks.

A brief discussion of worker health and safety training can also be found in Section 1.6.9 of the Five-Year Plan. A more detailed description and discussion of this issue can be found in the EM Safety and Health Five-Year Plan for FY 1994-1998.

DOE and EM have enforcement procedures similar in scope to those used by other Federal agencies. Clearly stated requirements, standards, and implementing guidance are identified, and responsibility is placed upon its workers and contractors to implement them. EM managers and its contractors conduct periodic self-assessments to specifically examine environment, safety and health performance, and to identify and mitigate potential problems. In addition, DOE and EM have extensive independent audit and appraisal programs to evaluate performance against the standards, and where problems are found they are clearly identified and the contractor is directed to correct the situation.

Based on comment suggestions, Figure 1.4b has been clarified and the accompanying text revised to more closely correspond with it.

Education and Training

STGWG and Stakeholders' Forum participants expressed interest in having the Five-Year Plan include more discussion of education and training. Regarding DOE's educational programs, participants thought that the Five-Year Plan should explicitly reference ongoing efforts to include under-represented groups. Comments received also wanted the plan to address the fragmentation of EM's education programs to show, for example, a connection between high school, college, and post-graduate efforts. Regarding worker training, comments recommended that EM place greater emphasis on non-degree training and certification, and urged that EM look beyond its own resources for worker training/retraining (i.e., union training).

DOE agrees that education and training are important issues, crucial to the success of its cleanup efforts. For this reason, DOE is very active in promoting opportunities and programs through which more people can become involved in the EM mission. As discussed in the Five-Year Plan, DOE has a wide range of educational initiatives—from high school student programs to minority recruiting programs—and is actively pursuing further opportunities. In response to STGWG/Stakeholder comments, DOE has tried to show a connection in the Five-Year Plan between these diverse efforts and to provide more detail about programs for involving under-represented groups. This discussion appears as part of the Technology Development section (Section 2.4.5). Worker retraining and manpower needs are also discussed as part of the human and capital resources objective (Section 1.6.7).

Public Involvement

STGWG and Stakeholders' Forum participants had significant concerns regarding DOE's ability to effectively incorporate public participation into the Five-Year Plan development process. Several comments noted that DOE's public involvement efforts could be significantly improved. Recommendations included providing more detail regarding DOE public outreach and communication programs, as well as identifying successful public participation activities in the Five-Year Plan and using them to develop guidelines for use at the sites. Comments also stressed the need to improve public involvement efforts at the local level.

Since its inception in 1989, EM has recognized the need for early and substantive involvement in the Five-Year Plan development process, and has been gradually making progress on the public participation front. Soon after the first Five-Year Plan was developed, DOE formed STGWG to review it. The following year,

the Stakeholders' Forum was established to broaden external involvement. These two formal participation groups have been critical to seeking external input into the EM planning process. Every year, EM has continued to enhance and broaden public participation efforts. Most recently, as discussed in this Five-Year Plan, a new Office of Policy and Program Information was created to coordinate EM-wide participation efforts. This office and other EM public participation activities are discussed in Section 1.6.2.
As suggested, EM has been reviewing the site-specific public participation plans in an effort to develop effective general guidelines to be used at all the sites. It is anticipated that next year's local public involvement efforts will be more successful due to increased coordination and guidance from the Office of Policy and Program Information.

Section 1.6.2 was revised to provide a clearer picture of public participation in EM's programs, including EM objectives, recent accomplishments, and strategies for overcoming existing obstacles to increased involvement.

Cost Estimates

DOE received several letters from STGWG and Stakeholders' Forum members regarding Five-Year Plan cost estimates. A major concern was that it is difficult to measure progress and to track DOE commitments to compliance agreements without the publication of cost estimates. In addition, members raised a number of issues with the Activity Data Sheets (ADSs). One concern was that ADSs lack uniformity in scope and derivation. Another comment suggested that, even if specific cost estimates are not available, ADSs should identify which projects and compliance agreement milestones will be funded.

Planning estimates were absent in the predecisional draft circulated to STGWG and the Stakeholders' Forum because the estimates were not completed. Several groups, including the Interagency Review Group, the Office of Management and Budget, the U.S. Army Corps of Engineers, and DOE itself, have recently conducted careful reviews of the EM program. Their findings are contributing to an improved cost estimation and validation process. However, because of the demands of multiple cost reviews and other time constraints, the development of ADSs to support the FY 1994—1998 Five-Year Plan was delayed. These delays and uncertainties are also impacting publication of the Five-Year Plan, and DOE has notified Congress of the schedule changes.

The ADS format has been revised this year to allow for improved reporting of legal requirements. All activities are categorized as either legally driven, required by DOE Environment, Safety, and Health Order, or as other essential management activities. For each milestone, the specific regulatory driver is referenced, in addition to a planned completion date. Also, it is important to note that ADSs are not funding documents but planning documents used to develop funding requests. The ADSs that support this plan are available in public reading rooms (Appendix E).

Research and Technology Issues

Several STGWG members and Stakeholders' Forum participants expressed concern that EM's technology development program is being driven by contractors. It was felt that technology development efforts should have a strong "needs based" orientation. In addition, comments suggested that DOE create an outreach program to help technology transfer to private industry, and that DOE make better use of the institutions and universities available for applied research.

DOE's technology development efforts are needs driven—they are undertaken in response to requirements identified by EM program offices, specifically Environmental Restoration and Waste Management. Section 2.4.5 of the Five-Year Plan discusses technology development in detail.

DOE is interested in establishing working relationships with universities and institutions. The Five-Year Plan includes a discussion of DOE efforts in establishing academic partnerships (Section 1.6.7). DOE is also interested in expanding technology transfer to the private sector. As discussed in the Five-Year Plan, both DOE and industrial laboratories can benefit from these exchanges through increased credibility and understanding of technical needs. A "strategies" discussion has been added to Section 2.4.5 of the plan to clarify DOE's efforts in this area.

Transition Issues

Participants at the STGWG meeting thought that the Facility Transition module of the Five-Year Plan (Section 1.6.3) was inadequate for a program of its significance, and suggested that the plan be changed to reflect the importance of transition planning. Stakeholders were primarily concerned that DOE develop a plan for retraining employees as it continues to close and consolidate facilities. Comments from both groups also recommended that the plan discuss DOE landlord activities in more detail.

The Facility Transition module has been expanded to reflect the importance of transition planning within the EM planning process. The facility transition issue is significant because it demonstrates DOE's commitment to cleanup goals, has a significant effect on local work forces, and affects the end-use of the site. Because of its potential effect on local communities, facility transition must be discussed in tangible terms.

Both Sections 1.6.3 and 2.3.1 have been expanded to reflect the importance of transition planning issues, and confusing graphics have been replaced (Figure 1.6.3a, for example). Section 1.6.3 now includes more background information on facility transition and how it has assumed a greater role within EM. In addition, a summary of the process is presented in Section 2.3.1, and the plan has been revised to clarify EM's landlord responsibilities (Section 1.6.3).

Worker retraining is being considered in facility-specific transition plans and is a key consideration in the transition planning process. The Facility Transition and Management Program is working with the Technology Development Program to integrate retraining needs at EM facilities with programs that have been established through education programs. Facility Transition is also targeting retraining programs to projections of future resource needs. These programs are discussed in Sections 2.3.3 and 2.4.5 of the plan. In addition, discussion of the human and capital resources objective has been expanded to include retraining issues and strategies (Sections 1.6.7 and 2.4.5).

Risk-Based Management

Stakeholders' Forum participants expressed several concerns about risk assessment and risk-based decision making. Specifically, they felt that the Five-Year Plan does not adequately explain how risk-based decision making works, who is responsible for such decisions, and how it relates to the plan as a whole. In addition, comments noted that the Five-Year Plan does not indicate whether DOE intends to negotiate agreements on acceptable risks with legitimate Stakeholders.

Most DOE activities are legally-driven. To the extent that the regulations guiding EM's efforts are risk-based, so is the EM program. DOE recognizes the importance of understanding where risks lie and intends to negotiate with all affected parties on ways of addressing the issue. However, resolving the question of how to assign risk to DOE activities will not be a quick or easy process. It involves a number of questions, such as what are "acceptable" contamination levels and "how clean is clean," that evoke a wide range of responses. Section 1.6.4 discusses the problems associated with risk assessment and risk-based management, and possible strategies for resolving them. DOE will be working with affected and interested parties on risk-based management issues for a long time and welcomes any ideas or suggestions for addressing them.

Land-Use Planning

Land-use planning generated interest at both STGWG and the Stakeholders' Forum. Participants thought the Five-Year Plan should include: a better description of how DOE intends to deal with land-use issues and how they relate to risk management, specific reference to Treaty rights, a reference to how DOE intends to utilize the expertise of local governments, and an acknowledgement that a land-use plan should not be implemented without public approval.

DOE has only recently begun the process of developing a land-use planning approach to facility cleanup. As discussed in Section 1.3, the land-use planning process will consider such factors as current land-use, public expectations, cultural resources, local ecological and meteorological factors, legal rights, and Treaty obligations before recommending cleanup options and future uses.

In response to STGWG and Stakeholder comments, DOE has expanded and revised its discussion of land-use issues in the Five-Year Plan. The discussion deals with land-use issues at two levels: development of complex-wide land-use policy to address DOE's multiple missions, and implementation of land-use planning at the site level to guide the identification and evaluation of alternative future site uses and appropriate remediation strategies. Future land-use options will also be shaped by a large number of legal and regulatory requirements. Treaty rights should and will figure as prominent guiding forces for those sites subject to their provisions.

Like other aspects of the Five-Year Plan, the development of a land-use plan will be subject to external reviews and open to outside suggestions. As indicated in the plan, the process will include extensive public involvement. Participation will be encouraged and solicited from interested members of the general public as well as experts from State, local and Tribal governments.

Waste Minimization

Participants at the Stakeholders' Forum agreed that the Five-Year Plan needs a better description of what DOE is doing to recycle reusable materials. One comment wanted the plan to specify how much more waste is expected to be generated by EM activities. Other comments thought that DOE needs a greater emphasis on waste minimization and that the plan should provide an expanded discussion of these efforts.

As discussed in the Five-Year Plan, Waste Minimization is one of DOE's primary objectives. In light of its importance, DOE has included additional information about recycling efforts under way at DOE installations and the legal and technological obstacles to implementing a DOE-wide recycling program (Sections 1.6.6 and 2.1.1).

DOE has identified a number of trends that will significantly affect future waste production. These include decreased waste from reduced defense production and waste minimization efforts, and increased waste from weapons dismantlement and decontamination and decommissioning activities. DOE realizes the importance of identifying the extent of the waste that will be generated by EM activities and is in the process of estimating the effects of these trends on future DOE waste generation.

Five-Year Plan Structure and Organization

STGWG and Stakeholders' Forum participants generally agreed that the graphics used in the Five-Year Plan should be enhanced or modified. Comments noted some discrepancies between graphics and text, and criticized graphics and figures which made trivial or detracted from the overall tone of the plan. Another major issue raised at STGWG and the Stakeholders' Forum was the need for DOE to discuss EM commitments, accomplishments, and setbacks in a more straightforward manner. Other structural issues included a suggestion that early in the document DOE include a discussion of crosscutting issues, limitations, and how the plan attempts to prioritized activities. In addition, comments recommended including document references, reducing the number of acronyms, and clarifying the comprehensive EM vision. Comments also stressed the need to maintain an accurate and readable National Progress Chart.

In response to STGWG and Stakeholders comments, the Five-Year Plan has undergone numerous structural revisions. The quality and utility of the graphics in the plan have been significantly improved, inconsistencies between graphics and text have been corrected, and misleading or inaccurate graphics have been removed or replaced. The use of acronyms has also been significantly reduced throughout the plan, and a list of those acronyms used is printed on the inside back cover of the plan for easy reference.

DOE has been working on improving the tracking of EM progress and accomplishments. Last year, in part due to STGWG/Stakeholder comments, DOE developed the National Progress Chart. This Five-Year Plan includes a revised and updated version of the chart (Executive Summary and Section 1.2). The accompanying text has also been expanded to provide better detail on milestones that have been completed or changed. Crosscutting objectives are referenced early in the Five-Year Plan (Section 1.1) and discussed in greater detail in Sections 1.6 through 1.6.9. The system EM uses to prioritized activities is also discussed early in the plan in Section 1.4.

A concise statement of the DOE vision for environmental restoration and waste management has been added to the initial discussion of program mission and objectives (Section 1.1), as have the planning assumptions that underlie them. Major issues affecting the Environmental Restoration and Waste Management Program appear in Section 1.3. Major compliance issues are discussed throughout the plan, not only under issues and trends (Section 1.3), but also as part of the discussion of implementation of initiatives in the FY 1993-1997 Five-Year Plan (Section 1.4) and discussion of the program's compliance objectives (Section 1.6.5).

Installation Summaries/Site-Specific Issues

A number of STGWG members expressed concern about Volume II of the Five-Year Plan, the Installation Summaries. A suggested improvement was to have the summaries explain accomplishments and setbacks in a clearer, more candid manner. Specifically, it was felt that the technical terminology made the summaries difficult for those outside the DOE complex to understand. Other comments noted inconsistencies between the information displayed in the progress charts and the actual status of some milestones.

DOE agrees that the Installation Summaries presented in the predecisional draft of the Five-Year Plan were inadequate. Since the STGWG and Stakeholders' Forum reviews, all of the 37 site-specific summaries have undergone major revisions. In order to more accurately portray commitments and accomplishments, the information used in the progress charts for each site has been verified and updated. Additionally, where possible, the technical terminology has been deleted or clarified. Explanations for any slippages or setbacks are provided in the footnotes. Furthermore, the accompanying text has been modified to clearly support and expand upon information in the charts.

State and Tribal Government Working Groups and Stakeholders' Forum representatives are as follows:

State and Tribal Government Working Group

Barbara Barry
Colorado Department of Health

Jeff Breckel
Washington Department of Ecology

Carol Browner
Florida Secretary of Environmental Regulations

William H. Burke
Confederated Tribes of the Umatilla Indian Reservation

Marsden Chen
New York State Department of Environmental Conservation

David Bedan
Missouri Department of Natural Resources

Judith Espinosa
New Mexico Health and Environmental Department

George Gerstle
Office of the Governor, Colorado

Michael Grainey
Oregon Department of Energy

Valerie Hudson
Kentucky Department of Environmental Protection

David Humphrey
Idaho Department of Health and Welfare

Russell Jim
Yakima Indian Nation

Robert W. King, Jr.
South Carolina Department of Health and Environmental Control

Jack McGurk
California Department of Health Services

G. Tracy Mehan, III
Missouri Department of Natural Resources

Dan Miller
National Association of Attorneys General

Gale Norton
National Association of Attorneys General

Sam Penney
Nez Perce Tribal Executive Committee

Susan Rieff
Texas Environmental Policy Division

Cheryl Runyon
National Conference of State Legislatures

Gilbert Sanchez
Pueblo De San Ildefonso

James L. Setser
Georgia Department of Natural Resources

Ben Smith
Tennessee State Planning Office

David Thomas
Illinois Hazardous Waste Research and Information Center

Paul Thompson
National Governors' Association

Jack Van Kley
National Association of Attorneys General

John Walker
Agency for Nuclear Projects, Nevada

Tom Winston
Ohio Environmental Protection Agency

Jeanette Wolfey, Esq.
Shoshone-Bannock Tribes

Stakeholders' Forum

Mike Anderson
National Congress of American Indians

Lanny Bates
Martin Marietta Energy Systems, Inc.

Susan Baverick
Natural Resources Defense Council

Robert Benedetti
EG&G, Inc.

Ron Bhada
New Mexico State University

Judith Bostock
Clemson University

Eddie Boyd
Xavier University of Louisiana

Elmer Chatak
Industrial Union Department AFL-CIO

John Crockett
Oak Ridge Associated Universities

David Culp
Plutonium Challenge

August Curley
Clark Atlanta University

Scott Dam
American Nuclear Society

Donald Elisburg
Center to Protect Worker's Rights

Mike Flynn
International Association of Machinists and Aerospace Workers

Zada Friedersdorff
National Education Association

Chad Glenn
U.S. Nuclear Regulatory Commission

Steve Green
Westinghouse Environmental Affairs

LaDonna Harris
Americans for Indian Opportunity

Clyde Jupiter
American Nuclear Society

Melinda Kassen
Environmental Defense Council

Jim Lapping
Building and Construction Trades Department, AFL-CIO

Randy Legeai
Tulane University

Jan Linsenmeyer
Office of Technology Assessment

Phillip Niedzielski-Eichnor
Energy Communities Alliance

Pat Oshie
Yakima Indian Nation

Nancy Pearson
League of Women Voters of the United States

Nancy Pomerleau
U.S. Army Corps of Engineers

Sheldon Samuels
Workplace Health Fund

Marty Siegel
American Institute of Chemical Engineers

Ginger Swartz
Rocky Flats Environmental Monitoring Council

Mervyn Tano
Council of Energy Resource Tribes

Sandra Tillett
Occupational Health Foundation

Varien Tilton
Associated Western Universities

Gary Vine
Electric Power Research Insitute

James Watts
Oil, Chemical, and Atomic Workers International Union, AFL-CIO

James Werner
Natural Resources Defense Council

APPENDIX K

Five-Year Plan Document References

For more information on subjects discussed in the Five-Year Plan, please write: Five-Year Plan, (EM-14), Office of Environmental Restoration and Waste Management, 1000 Independence Ave., Washington, DC 20585. Most referenced documents are available at either DOE reading rooms (see Appendix E), or through the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Rd., Springfield, VA 22161 (703) 487-4650.

1. Activity Data Sheets (ADSs): ADSs are made available each fiscal year, by site, in public reading rooms (see Appendix E for DOE reading room locations).

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21. *Nuclear Weapons Complex Reconfiguration Study,* U.S. Department of Energy, Washington, D.C., January 1991.

22. *Office of Environmental Restoration and Waste Management FY 1991–1995 Five-Year Plan (DOE/S-0070),* U.S. Department of Energy, Washington, D.C., August 1989.

23. *Office of Environmental Restoration and Waste Management FY 1992–1996 Five-Year Plan (DOE/S-0078P,* U.S. Department of Energy, Washington, D.C., June 1990.

24. *Office of Environmental Restoration and Waste Management FY 1993–1997 Five-Year Plan (DOE/S-0090P),* U.S. Department of Energy, Washington, D.C., August 1991.

25. *Resource Conservation and Recovery Act (RCRA) Workshop: Workshop Minutes,* State and Tribal Government Working Group (STGWG), Dallas, Texas, March 1992.

26. *Waste Minimization Crosscut Plan*, U.S. Department of Energy, Washington, D.C., May 1992.

27. Site-Specific Plans: Site-Specific Plans are made available each fiscal year, by site, in public reading rooms (see Appendix E for DOE reading room locations).

Glossary

academic partnerships. Agreements between DOE and 25 colleges and universities to support the development and modification of courses to provide curricula relevant to DOE environmental problems.

action plan. A plan describing a specific cleanup or corrective activity.

Activity-Based Costing (ABC). A planning method that considers activities rather than resources. ABC breaks the operation down into activities required to accomplish a task and describes the resources required to complete each activity. The summation of those resources justifies the basis for the funding request.

Activity Data Sheets (ADSs). Data prepared at the installation level to show specific plans, milestones, funding, compliance requirements, human resources and other pertinent information for the five-year period.

alpha-emitting. Certain radioactive elements that emit positively charged alpha particles. Alpha particles cannot penetrate the skin; however, they can be hazardous if swallowed, inhaled, or absorbed through a wound.

American Indian Policy. A policy issued by DOE on November 29, 1991. It outlines the principles to be followed by DOE in interactions with Federally recognized American Indian Tribes to ensure that Tribal rights and interests are identified and considered in pertinent DOE decision-making processes.

applicable or relevant and appropriate requirements (ARARs). 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 CERCLA (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.

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.

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 a release. Characterization provides the basis for acquiring the necessary technical information to develop, screen, analyze, and select appropriate cleanup techniques.

Clean Air Act (CAA). An act 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 Emission Standards for Hazardous Air Pollutants. The CAA was passed in 1970 amending 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 (NPDES) permit.

closure plan. Documentation prepared to guide the deactivation, stabilization, and surveillance of a waste management unit or facility under RCRA.

***Code of Federal Regulations* (CFR).** All Federal regulations in force are published annually in codified form in the *Code of Federal Regulations*.

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 abandoned and uncontrolled waste sites that could endanger public health, welfare, or the environment.

contact-handled TRU waste. Those items with external surface rates not exceeding 200 mrems per hour, which allows direct handling. (see Remote-handled TRU wastes.)

cryogenic. Using refrigerants to achieve very low temperature.

corridor States. States through which transportation routes to the Waste Isolation Pilot Plant are designated.

decommissioning. The process of removing a facility from operation, which may include 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.

de minimis limit. A level of contamination below which the effects are negligible.

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 Field Offices. DOE Field Offices located in Albuquerque, Chicago, Fernald, Idaho, Nevada, Oak Ridge, Richland, San Francisco, and Savannah River.

DOE Orders. Internal requirements that establish DOE policy and procedures for compliance with applicable laws and regulations.

Environmental Assessment: A written environmental analysis which is prepared pursuant to the National Environmental Policy Act (NEPA) to determine whether a Federal action would significantly affect the environment and thus require preparation of a more detailed environmental impact statement.

Environmental Impact Statement: A document required of Federal agencies by the National Environmental Policy Act (NEPA) for major projects or legislative proposals significantly affecting the environment which describes the positive and negative effects of the undertaking and lists alternative actions.

environmental restoration. Cleanup and restoration of sites contaminated with hazardous substances during past production or disposal activities.

Environmental Restoration Management Contractors (ERMCs). Contractors responsible for managing environmental restoration activities of the site. These ERMCs will select subcontractors who have demonstrated specific expertise, technology, and experience in performing cleanup activities. ERMCs will be responsible for reviewing and evaluating the subcontractors' work. EM believes that this system will improve the cost management control and efficiency of its activities.

Environmental Restoration Program. An EM subprogram 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. Remedial actions, most often concerned with contaminated soil and groundwater, and decontamination and decommissioning are responsibilities of this program.

Facility Transition and Management Program. An EM subprogram which manages the transfer to EM of the responsibilities and facilities that formerly belonged to the nuclear weapons program. Several sites have already been transferred to EM for deactivation and subsequent cleanup. As other sites are transferred to EM, the existing resources (funding and personnel) will be transferred to EM.

feasibility study (FS). A step in the environmental restoration process specified by CERCLA. The objectives of the FS 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 FS should result in unimpeded subsequent development of a remedial design for implementation of the selected remedial actions.

Federal Facilities Agreement (FFA). See compliance agreements.

Federal Facilities Compliance Act (FFCA). Federal law signed in October 1992. The objective of the FFCA is to bring all Federal facilities into compliance with applicable Federal and State hazardous waste laws, to waive Federal sovereign immunity under those laws, and to allow the imposition of fines and penalties.

Federal Facility Compliance Agreement (FFCA). See compliance agreements.

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 (GTCC). Nuclear Regulatory Commission-developed, low-level waste disposal criteria based on concentration of radionuclides (Classes A, B, and C) that exceed the low-level waste limits for Class C and used to designate the waste as generally unacceptable for near-surface disposal.

groundwater. Liquid water occurring beneath the earth's surface in the interstices between soil grains, in fractures, or in porous formations.

hazard. An act or phenomenon posing potential harm to some person(s) or thing(s); the magnitude of the hazard is the amount of harm that might result, including the seriousness and the number of people exposed.

hazardous waste. As defined in RCRA, 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.

high-level waste (HLW). 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.

incineration. A treatment technology using combustion to destroy organic constituents and reduce the volume of wastes.

Indian Tribe. Any Indian Tribe, Band, Nation, or other organized group or community, including any Alaska Native village, but not including any Alaska Native regional or village corporation, that is recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians.

Integrated Demonstration (ID). A systems engineering concept to test methods for solving generic problems and then customize the resulting technological system for use at similar sites.

Interagency Agreement (IAG). A written agreement, enforceable by law, between EPA and another Federal agency where goods and/or services are provided, whether in exchange for monetary reimbursement or where policy agreements are delineated. IAGs for CERCLA activities may function both as obligating documents and as reporting documents necessary for EPA financial and program management.

land disposal restrictions (LDRs). A RCRA program that restricts land disposal of RCRA hazardous wastes and requires treatment to promulgated treatment standards.

landlord. Landlord responsibilities are assigned to the program that accounts for the major activities conducted at the site and include the provision of capital assets at installations. EM is currently the landlord at Richland, Fernald, Oak Ridge K-25 Site, and Idaho and is expected to add Pinellas, Mound, and Rocky Flats within the FY 1994–FY 1998 planning period.

land-use planning. A decision-making process to determine the future or end use of a parcel of land, considering such factors as current land use, public expectations, cultural considerations, local ecological factors, legal rights and obligations, technical capabilities, and costs.

low-level waste (LLW). Radioactive waste not classified as high-level waste, transuranic waste, spent nuclear fuel, or by-product material.

Memorandum of Understanding. A document stating the terms of agreement between two agencies.

milestone. A designation of the time frame within which certain elements of a program will be accomplished to permit management to track progress.

mixed waste. Waste containing both radioactive and hazardous components, as defined by the Atomic Energy Act and RCRA.

National Emission Standards for Hazardous Air Pollutants (NESHAPs). 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 requirements 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 (NPL). EPA's list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial response using money from the Trust Fund. The list is based primarily on the score a site received on the Hazard Ranking System. EPA is required to update the NPL at least once a year.

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 spent fuel from civilian nuclear reactors.

Occupational Safety and Health Act (OSHA). An act to regulate and set safety and health standards through the Occupational Safety and Health Administration of the Department of Labor.

Office of Environmental Restoration and Waste Management (EM). Consists of five major subprograms—Waste Management and Corrective Activities, Environmental Restoration, Facility Transition and Management, Technology Development, and Transportation Management. These subprograms are interdependent parts of the overall EM program, sharing its goals and pursuing its objectives.

operable unit (OU). A discrete action that comprises an incremental step toward comprehensively addressing site problems. This discrete portion of a remedial response manages migration or eliminates or mitigates a release, threat of release, or pathway of exposure. The cleanup of a site can be divided into a number of operable units, depending on the complexity of the problems associated with the site. Operable units may address geographical portions of a site, specific site problems, or initial phases of an action or may consist of any set of actions performed over time or any actions that are concurrent but located in different parts of a site.

Operational Readiness Reviews (ORRs). Reviews that identify specific tasks that require completion before facilities can be certified as ready to commence operation.

Progress Tracking System (PTS). A computerized system that will provide monthly information on planned expenditures and milestones and actual expenditures and milestone completion dates for use by program managers, senior EM and DOE management, and external parties.

public participation. The process by which the views and concerns of the public are identified and incorporated into DOE's decisionmaking process.

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 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 CERCLA Remedial Investigation.

RCRA Part A Permit. The first part of a RCRA 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 RCRA permit application that describes wastes managed, quantities, and facilities.

Record of Decision (ROD). The CERCLA 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 that the manufacture, generation, transportation, alteration, or disposition of 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 Actions. Activities initiated to assess and clean up inactive DOE facilities or waste sites.

remedial investigation (RI). The CERCLA 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.

remote-handled TRU wastes. Those items whose external surface rate do exceed 200 mrems per hour. (see contact-handled TRU waste.)

reprocessing. The dissolution of spent reactor fuel and separation of uranium, transuranic elements, and fission products.

Resource Allocation Support System (RASS). A system being developed to provide a systematic and comparative evaluation of funding requests as well as projected short- and long-term costs of an option, taking into account the expected benefits associated with the proposed tasks.

Resource Conservation and Recovery Act (RCRA). A Federal law that established a regulatory system to track hazardous substances from the time of generation to disposal. The law required safe and secure procedures to be used in treating, transporting, storing, and disposing of hazardous substances. RCRA is designed to prevent new, uncontrolled hazardous waste sites.

risk. Adds to a hazard and its magnitude the probability that the potential harm or undesirable consequence will be realized. The concept of risk further quantifies hazards by attaching the probability of being realized to each level of potential harm.

risk assessment. The characterization of potential adverse effects of exposures to hazards; includes estimates of risk and of uncertainties in measurements, analytical techniques, and interpretive models; quantitative risk assessment characterizes the risk in numerical representations.

risk communication. An interactive process of exchange of information and opinion among individuals, groups, and institutions; often involves multiple messages about the nature of risk or expressing concerns, opinions, or reactions to risk messages or to legal and institutional arrangements for risk management.

roadmaps. A plan developed at the installation level that constitutes detailed analyses of issues that affect EM's ability to achieve long-term goals. These roadmaps approach long-range planning from the bottom up. They are very detailed and concrete and identify strategic issues that are traditionally addressed through top-down planning.

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. Guides the development of maximum contaminant levels that 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.

self-assessment. A program to evaluate environmental, safety, health, quality assurance, safeguards, and security activities at each DOE facility. Self-assessment programs also identify the root causes of findings and track their resolutions to completion.

shallow land burial. Disposal of wastes in shallow trenches; commonly used for low-level wastes.

site. For the purposes of the FY 1994–1998 Five-Year Plan, lands, installations, and/or facilities for which DOE has or shares responsibility for environmental restoration and waste management activities.

site inspection. The process under CERCLA 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.

Site-Specific Plans (SSPs). Plans developed by individual sites to provide the detailed planning for activities at each installation for the execution year, based on the Five-Year Plan for the subsequent five-year period.

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.

spent nuclear fuel (SNF). Irradiated nuclear reactor fuel before reprocessing; contains uranium, fission products, and transuranic elements.

stakeholders. Any person or organization with an interest in or affected by activities at a DOE site. Stakeholders may include representatives from Federal agencies, Congress, American Indian Tribes, unions, educational groups, industry, environmental groups, and others.

State and Tribal Government Working Group (STGWG). Includes representatives from 17 States, five affected Indian Tribes, three organizations representing the States' interests, and the Office of Management and Budget.

storage. Retention and monitoring of waste in a retrievable manner, pending final disposal.

Superfund Amendments and Reauthorization Act (SARA). The 1985 Act amending and reauthorizing CERCLA.

surplus facility. Any facility or site (including installed equipment) that has no identified programmatic use or that may or may not be radioactively contaminated to levels that require controlled access.

Technology Development Program. An EM subprogram that includes establishing and maintaining an aggressive national program for applied research, development, demonstration, testing, and evaluation to resolve major environmental restoration and waste management technology deficiencies by rapidly advancing technology beyond current capabilities.

Third Thirds Waste. EPA proposed the Third Third rule, as required by the Hazardous and Solid Waste Amendments of 1984, to establish treatment standards required prior to land disposal on November 22, 1989 (54 FR 48372). The final rule was issued on May 8, 1990. The Third Third rule established treatment standards and effective dates for all wastes (including characteristic wastes) for which treatment standards had not yet been promulgated (40 CFR Part 268.12), including derived-from wastes (i.e., multi-source leachate), and for mixed radioactive/hazardous wastes.

Toxic Substances Control Act (TSCA). A law enacted in 1976 to protect human health and the environment from unreasonable risk from exposure to the manufacture, distribution, use, or disposal of substances containing toxic chemicals. Under TSCA, any hazardous wastes that contain more than 50 ppm of polychlorinated biphenyls are subject to regulation under this Act.

Transition. The process of planning and carrying out the transfer to EM of production plants undergoing a mission change. Transition involves safely deactivating unneeded facilities and overseeing their smooth transfer to EM, where they may be either cleaned up or prepared for reuse.

Transition Working Group (TWG). An organization created to facilitate the transition planning activities at production plants that are undergoing a mission change. These groups are composed of EM and Defense Programs staff at DOE Headquarters, Field Office personnel, and representatives of the Management and Operating contractor at the plant.

Transportation and Emergency Management Program. The program responsible for the safe movement of wastes among facilities for the purposes of treatment, storage, and disposal. The Emergency Management Program is responsible for coordinating the response to adverse occurrences in EM operations.

transuranic waste (TRU). Waste that is contaminated with alpha-emitting radionuclides with an atomic number greater than 92 (heavier than uranium), half-lives greater than 30 years, and concentrations greater than 100 nanocuries per gram of waste.

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.

TRUEX. A process (transuranic extraction) for removing high-level waste that results in a twentyfold reduction in high-level waste volume; the remaining low-level waste has a volume commensurate to the original waste.

TRUPACT-II. A Nuclear Regulatory Commission-certified container designed specifically for transuranic waste transportation.

underground storage tank (UST). Any tank or associated piping containing hazardous materials as defined by the Hazardous and Solid Waste Amendment (Subtitle C or Subtitle I).

uranium mill tailings. A category of nuclear waste consisting of the by-products of uranium mining and milling.

Uranium Mill Tailings Radiation Control Act (UMTRA) of 1978. The act that 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 authorized DOE to undertake remedial actions at 24 designated inactive uranium-processing sites and at an estimated 5048 vicinity properties.

vitrification. The process of immobilizing waste that produces a glass-like solid that permanently captures the radioactive waste.

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.

WIPP Land Withdrawal Act. Signed on October 30, 1992, this Act withdraws public lands surrounding the WIPP site, establishes a new regulatory framework for WIPP involving regulatory oversight by EPA and other Federal agencies, and outlines numerous prerequisites for WIPP Test and Disposal Phases.

Waste Management Program. The EM subprogram that includes treatment, storage, and disposal of radioactive, hazardous, mixed, and sanitary waste generated by DOE activities. This program's efforts are dedicated to addressing the backlog of stored waste and new waste generated by EM's cleanup efforts.

waste stream. Terminology used to refer to waste leaving a facility or operation.

work breakdown structure (WBS). A hierarchical categorization of project activities scheduled to be implemented in FY 1993 that will provide a systematic structure for the flowdown of managerial direction and upflow of required reporting throughout the Waste Management Program. This arrangement will simplify and clarify the flow of information between Headquarters and Field Offices and will result in more effective management control.

ACRONYMS AND INITIALISMS

ADS	Activity Data Sheet
AIP	Agreement-in-Principle
AL	DOE Albuquerque Field Office
BNL	Brookhaven National Laboratory
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CH	DOE Chicago Field Office
CMS	Corrective Measures Study
CQM	Cost Quality Management
D&D	decontamination and decommissioning
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
EM	Office of Environmental Restoration and Waste Management
EMAC	Environmental Restoration and Waste Management Advisory Committee
EPA	U.S. Environmental Protection Agency
ERMC	Environmental Restoration Management Contractor
FEMP	Fernald Environmental Management Project
FFCA	Federal Facility Compliance Act Federal Facility Compliance Agreement
FN	DOE Fernald Field Office
FS	Feasibility Study
FUSRAP	Formerly Utilized Sites Remedial Action Program
FYP	Five-Year Plan
HLLW	high-level liquid waste
HLW	high-level waste
IAG	Interagency Agreement
ID	DOE Idaho Field Office
INEL	Idaho National Engineering Laboratory
KCP	Kansas City Plant
LANL	Los Alamos National Laboratory
LDR	land disposal restriction
LLW	low-level waste
MIDAS	Mobile Instrumentation System
NEPA	National Environmental Policy Act
NPL	National Priorities List
NRC	Nuclear Regulatory Commission
NTS	Nevada Test Site
NV	DOE Nevada Field Office
OMB	Office of Management and Budget
OR	DOE Oak Ridge Field Office
ORNL	Oak Ridge National Laboratory
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PCBs	polychlorinated biphenyls
PEIS	Programmatic Environmental Impact Statement
PGDP	Paducah Gaseous Diffusion Plant
PORTS	Portsmouth Gaseous Diffusion Plant
QA	quality assurance
QC	quality control
RCRA	Resource Conservation and Recovery Act
RF	Rocky Flats Office
RFI	RCRA Facility Investigation
RFP	Rocky Flats Plant
RI	Remedial Investigation
RL	DOE Richland Field Office
ROD	Record of Decision
SF	DOE San Francisco Field Office
SR	DOE Savannah River Field Office
SRS	Savannah River Site
STGWG	State and Tribal Government Working Group
TI&ED	Technology Integration and Education Development
TRAIN	Transportation Assessment and Integration
TRU	transuranic
UMTRA	Uranium Mill Tailings Remedial Action
UST	underground storage tank
VOCs	volatile organic compounds
WIPP	Waste Isolation Pilot Plant
WSSRAP	Weldon Spring Site Remedial Action Program

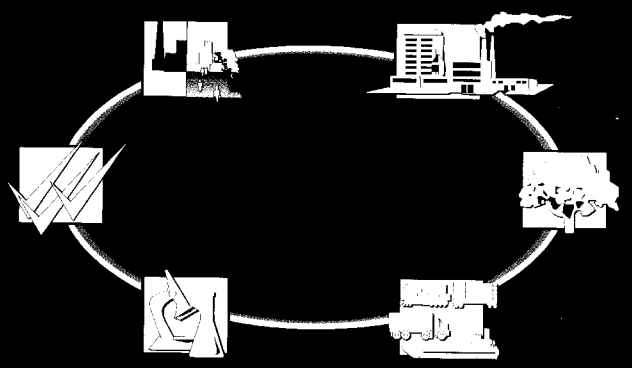
DOE/S-00097P Vol. 2

U.S. Department of Energy

Environmental Restoration and Waste Management Five-Year Plan

Fiscal Years 1994-1998

Installation Summaries



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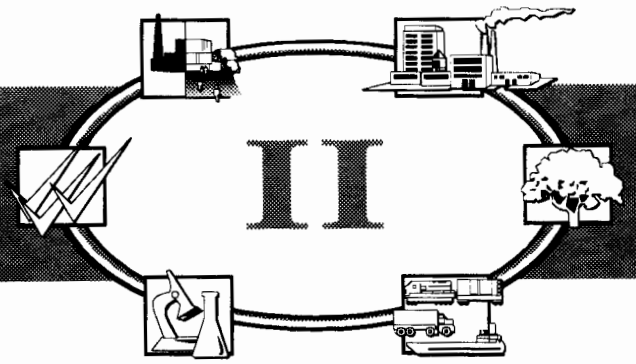
Environmental Restoration and Waste Management Five-Year Plan

Fiscal Years 1994-1998

Installation Summaries



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FY 1994–1998
FIVE-YEAR PLAN
CONTENTS

VOLUME II. INSTALLATION SUMMARIES

Albuquerque Field Office

Grand Junction Projects Office II-5
Inhalation Toxicology Research Institute II-10
Kansas City Plant II-15
Los Alamos National Laboratory II-22
Mound Plant II-30
Pantex Plant II-37
Pinellas Plant II-43
Sandia National Laboratories - Albuquerque II-49
Sandia National Laboratories - Livermore II-58
South Valley Site II-63
Uranium Mill Tailings Remedial Action Project II-68
Waste Isolation Pilot Plant II-75

Chicago Field Office

Argonne National Laboratory - East II-80
Argonne National Laboratory - West II-86
Battelle Columbus Laboratories II-92
Brookhaven National Laboratory II-96
Combined Laboratories (Ames, Fermi, Princeton) II-104

Fernald Field Office

Fernald Environmental Management Project II-110

Idaho Field Office

Idaho National Engineering Laboratory II-115
West Valley Demonstration Project Office II-124

Nevada Field Office

Nevada Off-Site Locations II-130
Nevada Test Site II-135

FY 1994–1998
FIVE-YEAR PLAN
CONTENTS

Oak Ridge Field Office

Formerly Utilized Sites Remedial Action Program II-143
Oak Ridge Gaseous Diffusion Plant (K-25 Site) II-148
Oak Ridge National Laboratory II-155
Oak Ridge Y-12 Plant II-164
Paducah Gaseous Diffusion Plant II-170
Portsmouth Gaseous Diffusion Plant II-177
Weldon Spring Site II-183

Richland Field Office

Hanford Site II-188

Rocky Flats Office

Rocky Flats Plant II-198

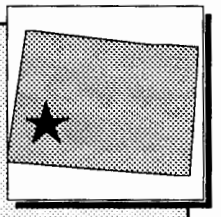
San Francisco Field Office

Laboratory for Energy-Related Health Research II-208
Lawrence Berkeley Laboratory II-213
Lawrence Livermore National Laboratory II-220
Santa Susana Field Laboratory II-230
Stanford Linear Accelerator Center II-236

Savannah River Field Office

Savannah River Site II-241

ALBUQUERQUE FIELD OFFICE
INSTALLATION SUMMARY
GRAND JUNCTION PROJECTS OFFICE



DESCRIPTION

The Grand Junction Projects Office (GJPO) 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 facility houses approximately 800 personnel in 35 buildings. Specialized facilities include the Analytical Chemistry Laboratory, DOE Core and Sample Repository, Electronics Laboratory, Instrument Calibration Facilities, Isotope Mass Spectrometry Laboratory, Petrology Laboratory, and the Radon Laboratory. Major programs include the Monticello Mill Tailings and Vicinity Properties National Priorities List (NPL) sites being remediated under the authority of CERCLA, decontamination and decommissioning (D&D) at the GJPO Site, Long-Term Surveillance and Maintenance Program, and the Environmental Management Technical Center. The Uranium Mill Tailings Remedial Action (UMTRA) Grand Junction Vicinity Properties Project and associated work is now presented with the Albuquerque-UMTRA Installation Summary.

STRATEGIC OUTLOOK

GJPO provides direct support to EM and to the Field Offices in the areas of site characterization, project integration and coordination, remedial design, remedial action, independent verification, D&D, long-term surveillance and maintenance, assessment of technology needs, geosciences, and analytical chemistry. The NPL Monticello Site projects are governed by the approved Federal Facilities Agreement schedule and CERCLA Records of Decision and requirements. The Long-Term Surveillance and Maintenance Program provides surveillance, monitoring, and maintenance of completed off-site DOE disposal sites. GJPO supports, facilitates, and carries out environmental cleanup projects throughout DOE, which is accomplished by applying GJPO's spectrum of capabilities where prompt actions are required to address possible impacts to human health and the environment.

Remedial action at the GJPO facility is scheduled for completion during FY 1994. Long-Range Plans are to support EM by continuing to facilitate restoration activities. As work on some of the larger programs assigned to GJPO winds down, more expertise will be available for EM needs.

The GJPO Technology Development Program helps to define EM technology development needs through widespread participation in Technology Support Groups. Specific GJPO tasks emphasize EM high-priority needs for nonintrusive characterization methods and for a well-trained, educated work force to efficiently and effectively remediate DOE sites.

ACCOMPLISHMENTS (FY 1991 – 3Q FY 1992)

Environmental Restoration

Monticello Remedial Action Project

- Completed the 30 percent engineering repository design.
- Submitted the first three peripheral property design packages.
- Awarded millsite preparation subcontract.
- Submitted the land procurement package.
- Initiated continuous physical on-site remedial action activities required by CERCLA.
- Completed option analysis of repository liner design.

Monticello Vicinity Properties Project

- Completed 125 land survey construction activities.
- Completed 147 radiological assessment construction activities.
- Completed 81 engineering design construction activities.
- Completed 28 Vicinity Property construction completions.

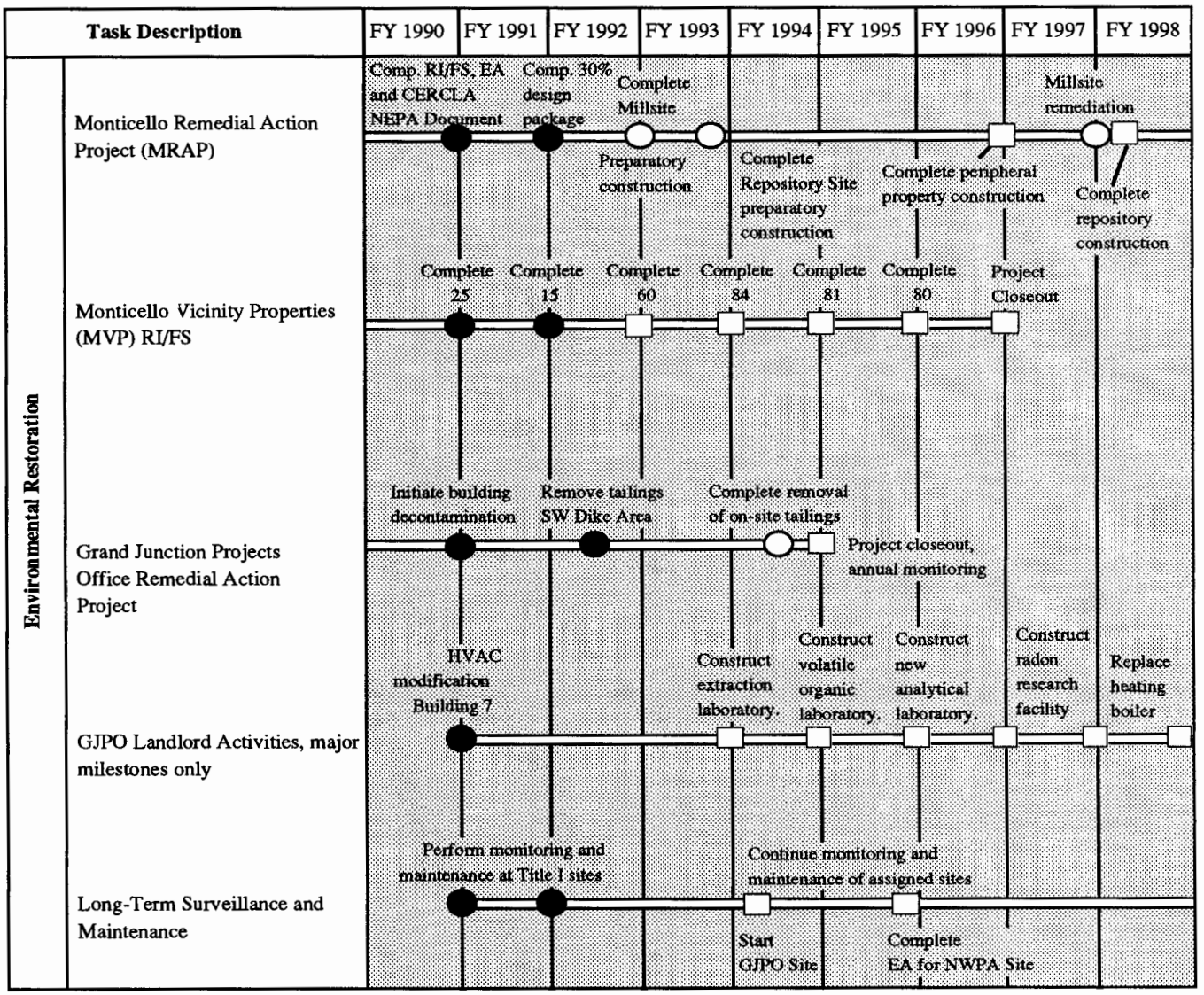
Grand Junction Projects Office Remedial Action Project

- Continued hauling of tailings to the interim repository (255,000 tons).

ALBUQUERQUE FIELD OFFICE
PROGRESS CHART
GRAND JUNCTION PROJECTS OFFICE

Long-Term Objectives
Complete Monticello Remedial Action Project.
Continue long-term surveillance and maintenance of off-site DOE disposal sites.

Five-Year Objectives
Complete GJPO Remedial Action Projects.
Complete Monticello Vicinity Properties.



Milestone Types	Milestone Status
○ Unchanged from FY 1993–1997 FYP	○ ◇ □ Planned
◇ New since FY 1993–1997 FYP	● ◆ ■ Complete
□ Changed from FY 1993–1997 FYP	◍ ◈ ▤ 50 percent complete
	- - - → Information flow

Notes and Acronyms

EA-Environmental Assessment
FYP-Five-Year Plan
GW-groundwater
HVAC-Heating, Ventilation and Air Conditioning
NEPA-National Environmental Policy Act
RI/FS-Remedial Investigation/Feasibility Study
SW-Southwest

MAJOR MILESTONES

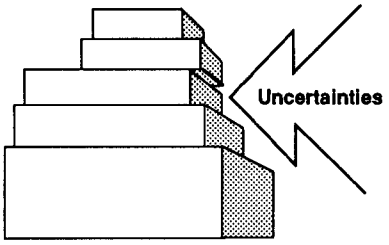
	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
Monticello Remedial Action Project			
• Complete 90 percent repository design package.	1Q FY 1993	2Q FY 1993[1]	CERCLA Sect. 120
• Complete repository site preparation and millsite pre-excavation activities.	3Q FY 1993	4Q FY 1993[1]	CERCLA Sect. 120
• Complete tailings removal to repository.	4Q FY 1996	1Q FY 1998[1]	CERCLA Sect. 120
Monticello Vicinity Properties			
• Complete 60 construction activities.	4Q FY 1992	4Q FY 1992	CERCLA Sect. 120
• Complete 84 construction activities.	4Q FY 1993	4Q FY 1993	CERCLA Sect. 120
• Complete 81 construction activities.	4Q FY 1994	4Q FY 1994	CERCLA Sect. 120
• Complete 80 construction activities.	4Q FY 1995	4Q FY 1995	CERCLA Sect. 120
• Complete project closeout activities.	New	4Q FY 1996	CERCLA Sect. 120
GJPO Remedial Action Project			
• Complete Remedial Actions.	4Q FY 1992	4Q FY 1994[2]	DOE/ Defense D&D
• Complete project closeout activities.	4Q FY 1993	4Q FY 1994[2]	DOE Defense D&D
Long-Term Surveillance and Maintenance			
• Start long-term monitoring of GJPO Site.	New	1Q FY 1994	DOE Order 5400.1 Attachment 1.1
• Complete Environmental Assessment for Nuclear Waste Policy Act 151(c) Site.	New	4Q FY 1995	DOE Order 5440.10 10 CFR 1021.200 (a), and 1021.330(c)
EM Technical Center			
• Facilitate/assist industry in startup of prototype demonstration of Molten Sodium Oxidation Process.	New	4Q FY 1994	RCRA/CERCLA

Note: Monticello Vicinity Properties reduction in construction activities because of fewer estimated properties requiring remediation.

[1]Slippage reflects current Remedial Design Work Plan.
[2]Slippage because of increased tonnages of waste uncovered.

CFR - *Code of Federal Regulations*

FIVE-YEAR PLAN ESTIMATES



There are a number of potential activities at Grand Junction Projects Office (GJPO) that may affect program requirements. These potential activities have not been included in the estimates below due to various uncertainties regarding scope of work, the phasing of regulatory reviews and approval schedules, availability of technology, lack of independent cost reviews and other factors. At GJPO, uncertainties in part relate to remedial action required by CERCLA, repository site preparation activities, and environmental assessment activities for the Nuclear Waste Policy Act 151(c) Site. If further analysis of these uncertainties and potential additional work results in additional funding needs based on legal requirements, DOE will, through mechanisms such as reallocating budgetary resources, requesting funds through the normal appropriation process, supplemental requests or internal reprogramming, pursue funding for these activities, or where appropriate, based on technical reasons, enter into the formal conflict resolution process with regulatory bodies.

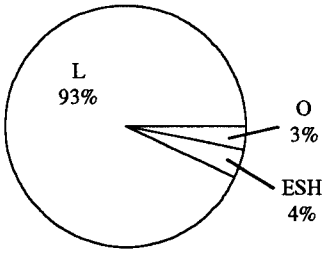
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Environmental Restoration	22,301	26,016	25,839	28,205	31,670	35,390	33,788
Total	22,301	26,016	25,839	28,205	31,670	35,390	33,788

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites.

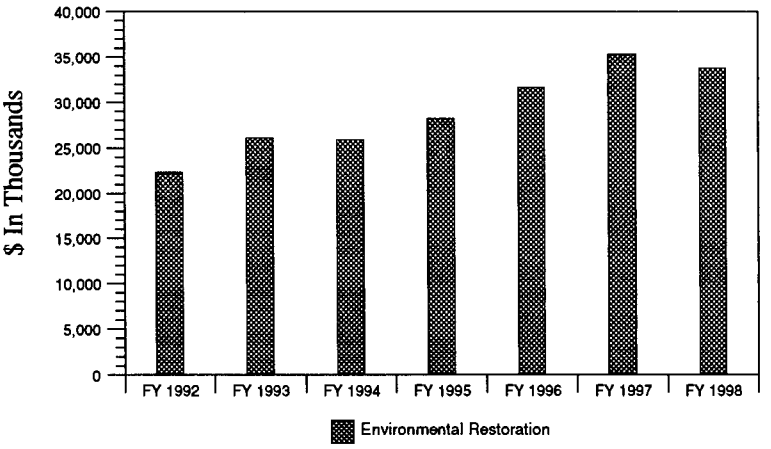
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



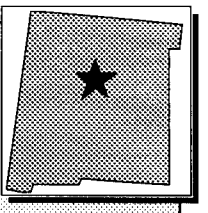
L- Legally Driven Requirements
ESH- Environment, Safety, and Health Requirements
O- Other Desirable Activities

Estimates by Year



For further information regarding Grand Junction Projects Office, call (505) 845-5699.

ALBUQUERQUE FIELD OFFICE
INSTALLATION SUMMARY
INHALATION TOXICOLOGY RESEARCH INSTITUTE



DESCRIPTION

The Inhalation Toxicology Research Institute (ITRI) occupies approximately 200,000 square feet of laboratory space on the southern edge of Kirtland Air Force Base outside of Albuquerque, New Mexico. ITRI facilities house research animals and generate sanitary, hazardous, low-level radioactive, limited transuranic, mixed, and biomedical wastes. ITRI conducts studies of the health effects of inhaling potentially hazardous airborne materials that might be found in industry, the environment, or the home. Such materials might include fission products, fuel cycle actinides, insulating materials, diesel exhaust emissions, coal combustion effluents, or other substances that might result from energy production or conservation technologies.

STRATEGIC OUTLOOK

ITRI's Five-Year Plan addresses two major programs: (1) environmental restoration, involving assessment and eventual cleanup of four sites that may have been contaminated with hazardous substances, and (2) waste management, involving proper management by collection, segregation, treatment, storage and eventual disposal of all hazardous, radioactive and sanitary wastes that are generated on-site.

The Environmental Restoration Program is directed toward assessment and remediation in three areas. This work will begin in FY 1992 and will be completed during the FY 1993–1998 period:

- Diesel Oil Release: On-site locations of past leaks and spills have resulted in soil and possibly groundwater contamination to a possible depth of 112 feet.
- Hot Pond Site: Consists of two small (30 feet by 30 feet) concrete-lined evaporating ponds that contain low-level radioactive contamination and possibly soil contamination. The radioactive contents of these ponds have already been removed and disposed of off-site.
- Lagoons and Groundwater: This ten-acre area contains sewage sludge from 29 years of operation as facultative sanitary sewage lagoons. The sludge may contain trace quantities of hazardous substances. Nitrate in excess of New Mexico standards is present in groundwater 90 to 120 feet beneath the lagoons.
- Regulatory drivers for environmental restoration activities at ITRI include New Mexico Underground Storage Tank Regulations, New MexicoWater Quality Control Commission Regulations, and a Tri-Party argeement among DOE, EPA, and the State.

ITRI disposes of all hazardous wastes at EPA-permitted commercial off-site disposal sites. All radioactive wastes are disposed of at DOE-owned sites. Sanitary sewage has been disposed of in on-site sewage lagoons, which resulted in groundwater nitrate contamination. Beginning in 1992, sanitary sewage is being disposed of in a municipal sewer system and the lagoons will be decommissioned. Past underground storage tank leaks have produced diesel oil contamination. Past use of small concrete-lined evaporation ponds have resulted in low-level radioactive contamination at one on-site location.

STRATEGIC OUTLOOK (Continued)

The Waste Management Program plans for the proper management of ITRI's wastes that will be generated by research activities during the lifetime of the institute. The long-term (five to 30 year) outlook for the institute shows little change in the present levels of research; biomedical research remains the prime activity. All future activities will continue to be conducted on the present site.

ITRI follows and is in compliance with all laws and regulations pertaining to the care and treatment of laboratory animals, including those of the National Institute of Health, the U.S. Department of Agriculture, and the American Association for Accreditation of Laboratory Animal Care. These requirements include approval of animal research conditions and methods and regular inspections. Going one step further to ensure humane care and treatment of laboratory animals, ITRI established the Animal Care Committee, which includes a representative from the local community to assist in oversight.

ACCOMPLISHMENTS (FY 1991 – 3Q FY 1992)

Corrective Activities

- The sewer line was completed during 1991 and will enable ITRI to dispose of sanitary sewage to the Albuquerque Sewage Treatment Plant. This sewer line now allows decommissioning of the present lagoon system so that assessment and cleanup under the Environmental Restoration Program may begin.

Waste Management

- ITRI's application to dispose of low-level radioactive waste at the Nevada Test Site has been granted. This approval will enable the resumption of shipments of such waste. These shipments were discontinued in April 1990.
- Two electrical transformers containing polychlorinated biphenyls (PCBs) have been removed and replaced with non-PCB transformers. One PCB-contaminated transformer has been drained and filled twice to reduce its PCB concentration to below one part per million.
- Procedures were formalized to ensure that radioactive waste is not sent off-site to commercial facilities inadvertantly.
- The amount of nuclear waste was reduced through solvent substitution.

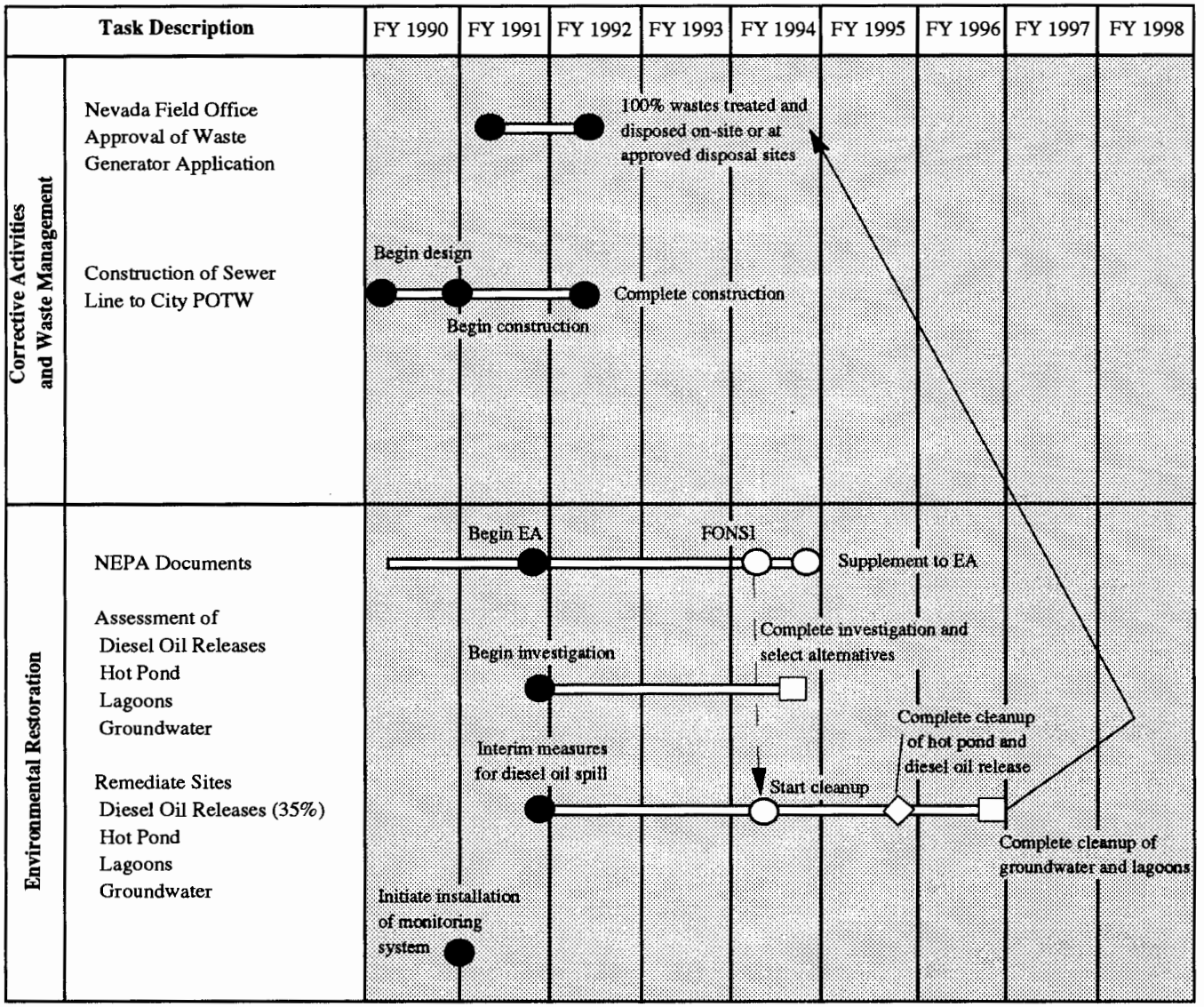
Environmental Restoration

- A preliminary hydrogeologic study was completed, and one additional groundwater monitoring well was installed west of the lagoon site. This study, together with sampling data from the new well, will be used to determine whether groundwater nitrate contamination has migrated off-site.
- Preliminary core drilling has tentatively defined known diesel oil spill sites. One groundwater monitoring well has been installed. A Subsurface Volatilization and Ventilation System has been installed at one site as an interim remedial measure to remove diesel oil by in situ removal of volatile components and bioremediation of nonvolatile components.

ALBUQUERQUE FIELD OFFICE
PROGRESS CHART
INHALATION TOXICOLOGY RESEARCH INSTITUTE

Long-Term Objectives
Clean up lagoon, hot pond, groundwater, diesel oil spills.

Five-Year Objectives
Clean up lagoon site.
Complete hot pond site assessment.
Clean up diesel oil spills 35%.
Have groundwater remediated and monitoring program in place.



Milestone Types

- Unchanged from FY 1993-1997 FYP
- New since FY 1993-1997 FYP
- Changed from FY 1993-1997 FYP

Milestone Status

- Planned
- 50% complete
- Complete
- Information flow

Notes and Acronyms

EA - Environmental Assessment
FYP - Five-Year Plan
FONSI - Finding of No Significant Impact
NEPA - National Environmental Policy Act
POTW - Publicly Owned Treatment Works

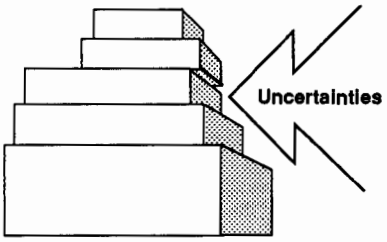
MAJOR MILESTONES

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
Corrective Activities			
• Complete removal and relocation of tanks and lines.	FY 1991	3Q FY 1993[1]	NMUSTR No. 1205-1219
Waste Management			
• Complete upgrade of waste treatment building.	FY 1993	4Q FY 1993	DOE Order 5820.2A
• Properly treat scintillation vial mixed waste.	FY 1991	4Q FY 1992[2]	DOE Order 5820.2A
Environmental Restoration			
• Complete assessment of diesel oil release.	FY 1993	4Q FY 1993	NMUSTR No. 1205-1219
• Complete assessment of hot ponds.	FY 1993	2Q FY 1994[3]	DOE Order 5400.1, .4, .5
• Complete assessment of sanitary lagoons and groundwater.	FY 1993	4Q FY 1994[3]	NMWQCCR Part 3, 103A, B
• Complete cleanup of diesel oil release.	New	3Q FY 1995	NMUSTR No. 1205-1219
• Complete cleanup of hot ponds.	New	3Q FY 1995	DOE Order 5400.1, .5, .14
• Complete cleanup of sanitary lagoons and groundwater.	FY 1997	2Q FY 1996	NMWQCCR Part 3, 103A, B

[1]Old tank removed, new tank in operation. Old piping removal delayed by labor problem.
[2]Vials shipped to treatment facility; awaiting treatment.
[3]Sanitary sewer hookup delay has caused cleanup and assessment schedule readjustment.

NMUSTR - New Mexico Underground Storage Tank Regulations

FIVE-YEAR PLAN ESTIMATES



There are a number of potential activities at the Inhalation Toxicology Research Institute (ITRI) that may affect program requirements. These potential activities have not been included in the estimates below due to various uncertainties regarding scope of work, the phasing of regulatory reviews and approval schedules, availability of technology, lack of independent cost reviews and other factors. At ITRI, uncertainties in part relate to environmental restoration activities in conjunction with diesel oil releases, hot ponds, and lagoons. If further analysis of these uncertainties and potential additional work results in additional funding needs based on legal requirements, DOE will, through mechanisms such as reallocating budgetary resources, requesting funds through the normal appropriation process, supplemental requests or internal reprogramming, pursue funding for these activities, or where appropriate, based on technical reasons, enter into the formal conflict resolution process with regulatory bodies.

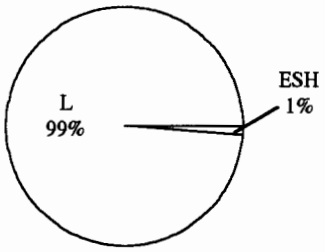
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Corrective Activities/Waste Management	1,096	449	535	449	449	449	449
Environmental Restoration	2,863	2,733	2,954	2,445	3,487	597	0
Total	3,959	3,182	3,489	2,894	3,936	1,046	449

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites.

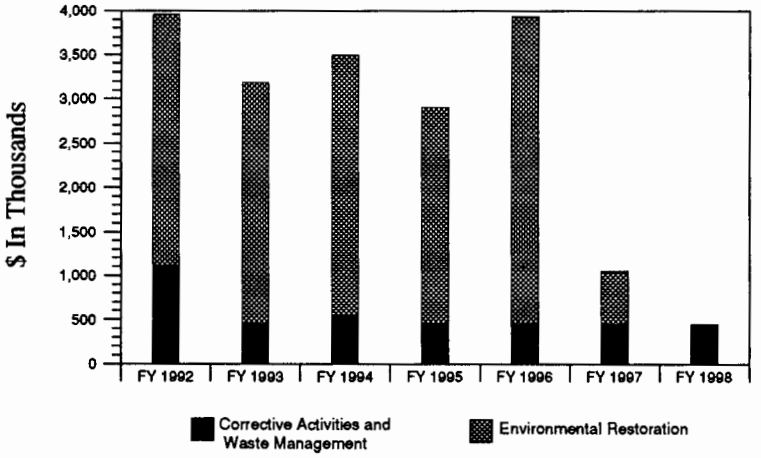
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



L- Legally Driven Requirements
ESH- Environment, Safety, and Health Requirements

Estimates by Year



For further information regarding Inhalation Toxicology Research Institute, call (505) 845-5699.

ALBUQUERQUE FIELD OFFICE
INSTALLATION SUMMARY
KANSAS CITY PLANT

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 square feet of building space. The plant mission is the manufacturing of nonnuclear weapons components involving machining, plastic fabrication, and electrical and mechanical assembly. No radioactive materials are machined or processed. Waste operations consist primarily of waste storage, off-site shipment and disposal, and on-site wastewater treatment for industrial process wastewaters. Twenty-seven sites are currently undergoing remediation.

STRATEGIC OUTLOOK

KCP has been named as the DOE preferred site for the consolidation of nonnuclear manufacturing facilities in the nuclear weapons complex. An Environmental Assessment, scheduled for completion in early 1993, is required for this decision to be finalized. Provided no significant environmental impact is identified, DOE plans to proceed with a three-year program to phase out nonnuclear production operations at the Mound, Pinellas, and Rocky Flats Plants and transfer many of these activities to Kansas City. KCP will likely remain the focus of these consolidated nonnuclear production operations well into the next century. Consolidation is expected to result in an expanded waste management program with no impact on environmental restoration.

Principal waste management operations at KCP include hazardous and toxic waste storage in preparation for off-site treatment or disposal in compliance with RCRA. KCP performs no on-site waste disposal. Treatment operations are limited to industrial wastewater pretreatment in compliance with the Clean Water Act. Small quantities of low-level radioactive and low-level mixed wastes also are generated and stored for off-site treatment or disposal. Effective and uninterrupted waste treatment, storage, disposal, and minimization activities are of critical importance to the plant mission and are necessary to ensure regulatory compliance and protection of plant personnel, the environment, and the surrounding community. The major concerns addressed under corrective activities are potential flooding of the plant, which is in a 500-year floodplain, and infiltration of contaminated groundwater into storm sewers.

The primary objective of the Environmental Restoration Program is to identify the nature and extent of environmental contamination and to clean up inactive waste sites in compliance with the RCRA 3008(h) Administrative Order on Consent. KCP's long-term objective is to clean up all contaminated sites by FY 2000 with the exception of groundwater, which requires long-term and ongoing treatment. The highest priority of the Environmental Restoration Program is the Northeast Area Remediation, where an interceptor trench and recovery wells have been installed to protect the Blue River from a groundwater plume contaminated with chlorinated solvents. Groundwater treatment technology has been successfully demonstrated and is being used for continued treatment of contaminated groundwater.

Future technology development efforts will focus on pollution prevention and waste minimization to reduce air emissions and hazardous waste generation. KCP currently is involved in a joint effort with Sandia National

STRATEGIC OUTLOOK (Continued)

Laboratories–Albuquerque to develop and demonstrate environmentally conscious manufacturing processes that will replace various hazardous materials used in production. This program will also support KCP efforts to work with local schools and universities as well as private industry.

ACCOMPLISHMENTS (FY 1991 – 3Q FY 1992)

Corrective Activities

- Completed design of flood protection system and awarded construction contract.
- Repaired portions of the storm sewer and initiated project design to prevent contaminated groundwater infiltration.
- Repaired and sealed surface of hazardous waste storage lots.

Waste Management

- Oversight of waste generators has been expanded and centralized in waste management operations.
- On-site waste transportation function was transferred to waste operations, eliminating the storage of potentially incompatible waste and cancellation of a $230,000 project for protection of the waste staging area.
- DOE Nevada Field Office audited the low-level radioactive waste program and procedures as required before shipment of waste to the Nevada Test Site. Program improvements are being implemented.
- Radioactive components are being removed from electronic assemblies and shipped off-site for disposal, thereby significantly reducing the volume of low-level mixed waste.
- Independent contractors were retained to provide a comprehensive review and audit of waste management operations. Improvements are being implemented and added to the RCRA Permit Application.
- Mercury waste was shipped off-site for reclamation.
- The Pollution Prevention/Waste Minimization Program was expanded to include completion of pilot process waste assessments.

Environmental Restoration

- EPA Public Notice comment period on Underground Tank Farm Corrective Action Plan began in March 1992.
- Received EPA approval on Abandoned Indian Creek Outfall Corrective Measures Study.
- Received EPA approval on five RCRA Facility Investigation Work Plans: Trichloroethylene (TCE) Still Area, Miscellaneous Contaminated Sites, Outfall 001, Department 26, and Plating Building.
- Conducted RCRA Corrective Action oversight inspection with no major findings.
- Received NEPA Categorical Exclusion determinations for Department 27 Interim Measures, Environmental Restoration Field Investigations for nine additional sites, and replacement of groundwater treatment system.
- Completed and submitted for EPA/Missouri Department of Natural Resources review the Final Corrective Measures Design for AICO.
- Completed RCRA Facility Investigation fieldwork for Miscellaneous Contaminated Sites and Plating Building.
- Completed interim measures work plan for Department 27 (Outside).
- Submitted Draft Interim Measures Design for Department 27 (Outside) to DOE-Headquarters for review.
- Received EPA/Missouri Department of Natural Resources approval for the Biota Study for the Northeast Area.

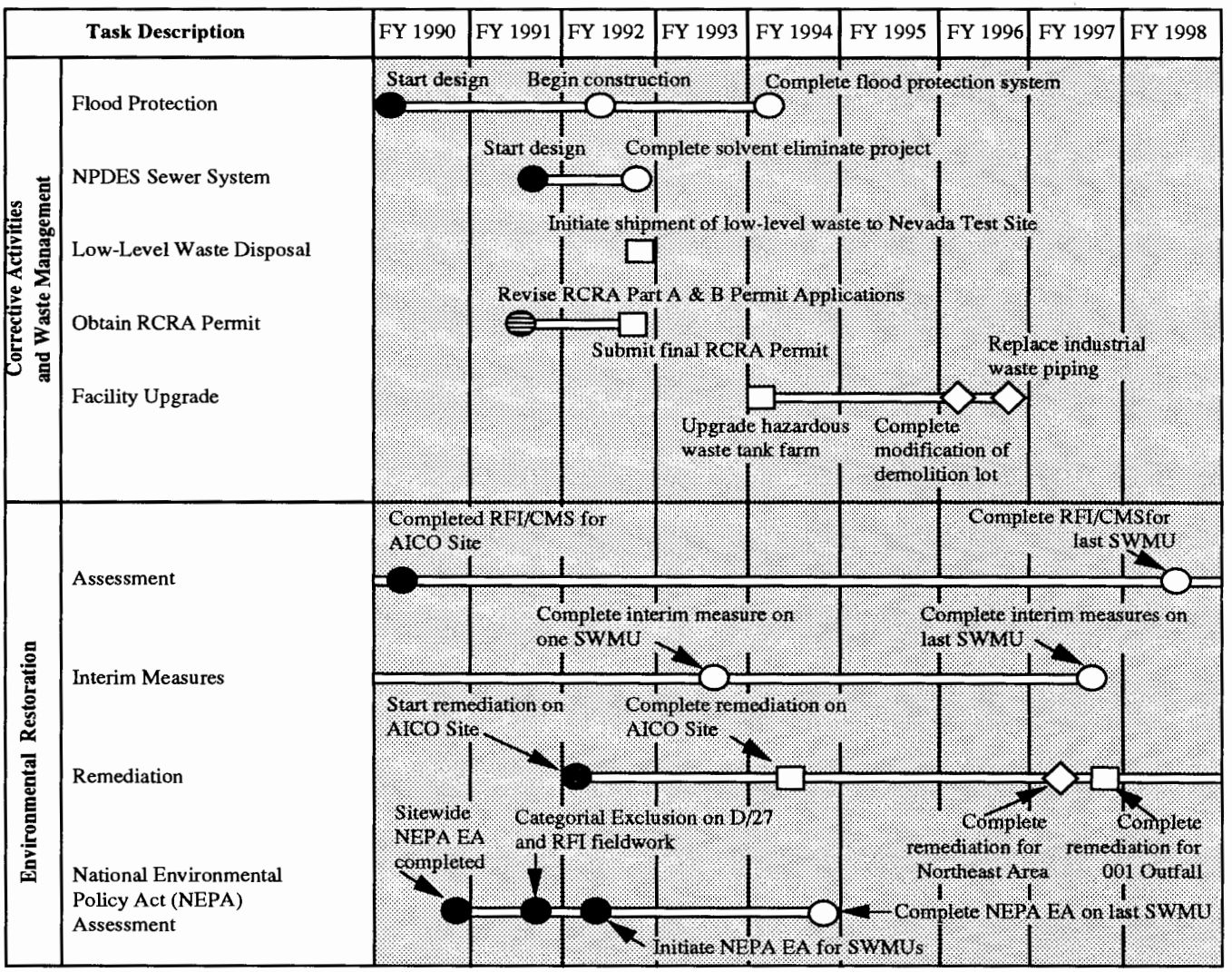
Technology Development

- Successfully demonstrated, tested, and evaluated ultraviolet/ozone/hydrogen peroxide groundwater treatment technology for use in the Environmental Restoration Program.
- Identified alternate cleaning processes and materials that significantly reduced air emissions and waste generation.
- Expanded environmentally conscious manufacturing initiatives to include electronic and electrical manufacturing processes and materials as well as solvent substitution.

ALBUQUERQUE FIELD OFFICE PROGRESS CHART KANSAS CITY PLANT

Long-Term Objectives
Clean up all SWMUs by FY 2000.
Continue compliance with waste management regulations.

Five-Year Objectives
Complete remediation for three SWMUs.
Complete assessment for 23 of 24 SWMUs.
Complete flood protection system.
Upgrade waste management storage facilities.



Milestone Types	Milestone Status
○ Unchanged from FY 1993–1997 FYP	○ ◇ □ Planned
◇ New since FY 1993–1997 FYP	● ◆ ■ Complete
□ Changed from FY 1993–1997 FYP	50 percent complete
	Information flow

Notes and Acronyms

AICO -Abandoned Indian Creek Outfall
CMI -Corrective Measures Implementation
CMS -Corrective Measures Study
EA -Environmental Assessment
FYP -Five-Year Plan
NPDES -National Pollutant Discharge Elimination System
RFI -RCRA Facility Investigation
SWMU -Solid Waste Management Unit

MAJOR MILESTONES

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
Corrective Activities			
• Complete flood protection system.	FY 1994	1Q FY 1994	TSCA 40 CFR 761.65, 264.18 44 CFR Part 9
Waste Management			
• Upgrade Hazardous Waste Tank Farm.	FY 1992	1Q FY 1994[1]	RCRA 40 CFR 265.171
• Complete Title II design to modify demolotion lot.	New	1Q FY 1995	RCRA 40 CFR 265.173B
• Complete modification of demolition lot.	New	1Q FY 1996	RCRA 40 CFR 265.173B
• Complete construction of equalization tank enclosure.	FY 1996	Canceled[2]	
• Replace industrial waste piping.	New	4Q FY 1996[3]	DOE Initiative
• Complete Title II design to eliminate total toxic organics.	New	4Q FY 1998	RCRA 40 CFR 433
• Ship low-level waste to Nevada Test Site.	FY 1992	3Q FY 1992	DOE Order 5820.2A, 5400.3, NVO-325
• Install backup batch treatment system.	FY 1992	Eliminated[4]	
Environmental Restoration			
• Complete Assessments of			
South Lagoon	FY 1992	1Q FY 1994[5]	RCRA 3008(h)
Outfall 001 Raceway	FY 1994	4Q FY 1994	RCRA 3008(h)
Plating Building	FY 1993	2Q FY 1996[6]	RCRA 3008(h)
Northeast Area	FY 1992	3Q FY 1995[6]	RCRA 3008(h)
Miscellaneous Contaminated Sites	FY 1994	3Q FY 1995[6]	RCRA 3008(h)
Trichloroethylene Still Area Soils	New	4Q FY 1995	RCRA 3008(h)
Department 26	FY 1993	4Q FY 1996[6]	RCRA 3008(h)
Department 27 - Inside	FY 1995	3Q FY 1998[6]	RCRA 3008(h)
• Complete Remediation of			
Department 27 - Outside	FY 1994	4Q FY 1993[6]	RCRA 3008(h)
Abandoned Indian Creek Outfall	FY 1993	2Q FY 1994	RCRA 3008(h)
Northeast Area	New	1Q FY 1997	RCRA 3008(h)
Outfall 001 Raceway	FY 1996	3Q FY 1997[6]	RCRA 3008(h)
South Lagoon	FY 1996	TBD[7]	RCRA 3008(h)
Miscellaneous Polychlorinated Biphenyl (PCB) Sites	New	4Q FY 1997	RCRA 3008(h)
Plating Building	New	TBD[8]	RCRA 3008(h)
Trichloroethylene Still Area Soils	New	4Q FY 1998	RCRA 3008(h)

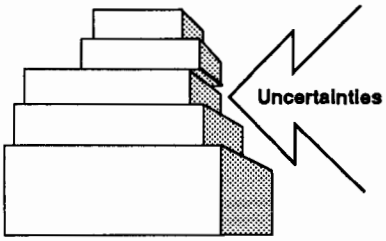
MAJOR MILESTONES (Continued)

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
Technology Development			
• Expand capabilities of Interim Precision Cleaning Facility.	New	4Q FY 1992	DOE Management Initiative
• Produce prototype production unit using environmentally conscious manufacturing technologies.	New	4Q FY 1992	DOE Management Initiative
• Support investigation and demonstration of waste management and environmental restoration technologies.	New	1Q FY 1996	DOE Management Initiative

[1] Slipped because of revision in scope of work.
[2] Cancelled; alternative protection option is being assessed.
[3] This project will replace the piping system that carries wastewater from the manufacturing facility to the Industrial Waste Pretreatment Facility.
[4] Project canceled because of reduced waste volumes negating need for redundant treatment system.
[5] Received EPA approval to place CMS and remediation on hold. Monitoring will continue.
[6] RFI/CMS combination report was split into separate deliverables extending the project and date.
[7] EPA determined that additional remediation is unnecessary and requested that groundwater monitoring be continued.
[8] Based on reprioritization of projects, remediation will be delayed until after FY 1998.

CFR - *Code of Federal Regulations*
TSCA - Toxic Substances Control Act

FIVE-YEAR PLAN ESTIMATES



There are a number of potential activities at the Kansas City Plant (KCP) that may affect program requirements. These potential activities have not been included in the estimates below due to various uncertainties regarding scope of work, the phasing of regulatory reviews and approval schedules, availability of technology, lack of independent cost reviews and other factors. At KCP, uncertainties in part relate to upgrades of the Hazardous Waste Tank Farm and remediation of the Abandoned Indian Creek Outfall Site. Additional uncertainties relate to the non-nuclear consolidation. If further analysis of these uncertainties and potential additional work results in additional funding needs based on legal requirements, DOE will, through mechanisms such as reallocating budgetary resources, requesting funds through the normal appropriation process, supplemental requests or internal reprogramming, pursue funding for these activities, or where appropriate, based on technical reasons, enter into the formal conflict resolution process with regulatory bodies.

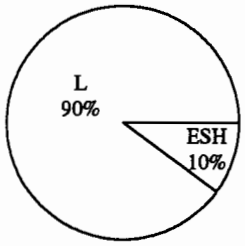
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Corrective Activities/Waste Management	11,717	9,851	8,333	9,002	9,871	10,828	11,060
Environmental Restoration	14,867	7,770	8,440	9,810	11,440	13,150	15,110
Total	26,584	17,621	16,773	18,812	21,311	23,978	26,170

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites.

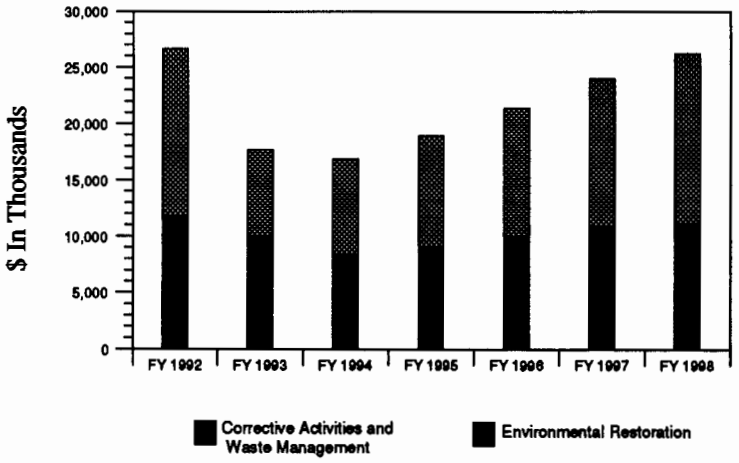
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



L- Legally Driven Requirements
ESH- Environment, Safety, and Health Requirements

Estimates by Year



For further information regarding Kansas City Plant, call (505) 845-5699.

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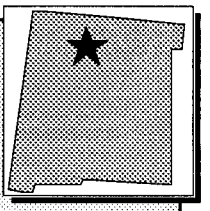
ALBUQUERQUE FIELD OFFICE
INSTALLATION SUMMARY
LOS ALAMOS NATIONAL LABORATORY



DESCRIPTION

Los Alamos National Laboratory (LANL) occupies about 43 square miles in Los Alamos County, approximately 60 miles north-northeast of Albuquerque and 25 miles northwest of Santa Fe. LANL is situated on the Pajarito Plateau, which is composed of finger-like mesas ranging in elevation from 6200 to 7800 feet. Major programs at LANL include applied research in nuclear and conventional weapons development, nuclear fission and fusion, nuclear safeguards and security, and waste management.

STRATEGIC OUTLOOK

The LANL strategy for Five-Year Plan implementation includes all activities necessary to comply with applicable laws and regulations that protect the public health and environment. The Five-Year Plan Program deals with hazardous, toxic, radioactive, and sanitary wastes. The Waste Management Program treats, disposes, and stores existing wastes generated at the laboratory. The Environmental Restoration Program identifies and cleans up sites where hazardous and radioactive wastes were disposed of in the past. Approximately 2250 potential release sites, aggregated into 24 operable units (OUs), are currently scheduled for investigation in the Environmental Restoration Program under the Hazardous and Solid Waste Amendments (HSWA) permit. Six surplus facilities are identified for decontamination and decommissioning (D&D) in the Five-Year Plan. The Corrective Activities Program brings facilities into regulatory compliance within a short time frame to address waste and other issues.

The Environmental Restoration, Waste Management, and Corrective Activities (ER/WM/CA) Programs are centered in the Environmental Management Division, and each program is headed by a program manager who reports to the EM Division Leader. The Research, Development, Demonstration, Testing, and Evaluation (RDDT&E) Program is managed by LANL's Technology Development Program, which coordinates its activities with the ER/WM/CA program management function.

Corrective Activities and Environmental Restoration Program OUs are located throughout the laboratory and adjacent areas and are remediated on an as-needed basis. Waste Management Program activities take place primarily at Technical Areas 50 and 54 and areas reserved for future development of waste management functions. LANL has implemented a five-part resource management strategy. It includes resource preservation, conservation, and restoration activities and will allow LANL to continue to accomplish its mission while minimizing its effects on the environment.

With the proposal to consolidate the nuclear weapons complex, transition activities at LANL are already in the planning stage. At this time, plans are preliminary and more information is forthcoming.

The principal regulatory drivers are as follows: Corrective Activities–Federal Facility Compliance Agreement and Administrative Order, Clean Water Act/National Pollutant Discharge Elimination System (NPDES) Permit, and RCRA; Waste Management–RCRA and the RCRA Operating Permit, Toxic Substances Control Act, HSWA, DOE Order 5820.2A; and Environmental Restoration–RCRA and the RCRA Operating Permit, including the HSWA Module VIII and CERCLA.

ACCOMPLISHMENTS (FY 1991 – 3Q FY 1992)

Corrective Activities

- Completed an updated conceptual design for the Centralized High-Explosive Wastewater Facility.
- Waste stream characterization for NPDES discharges are approximately 50 percent complete for entire site.
- Replaced 50 polychlorinated biphenyl transformers.
- Installed two major new aboveground replacement tanks.
- Continued construction of sanitary wastewater systems consolidation project.

Waste Operations

- Began preconceptual design of the Radioactive Liquid Waste Treatment Facility.
- Implemented Waste Minimization and Pollution Prevention Awareness Programs and Generator Education and Training.
- Formalized procedures to ensure that radioactive waste is not sent off-site to commercial facilities inadvertently.
- Improved record keeping and overall management of Waste Management Program activities.
- Analyzed and salvaged or disposed of 2000 compressed gas cylinders.
- Continued upgrades to Controlled Air Incinerator.
- Treated 25 million liters of radioactive liquid waste.
- Shipped 1400 cubic meters of hazardous waste off-site for incineration.
- Disposed of 6000 cubic meters of low-level waste in on-site facilities.

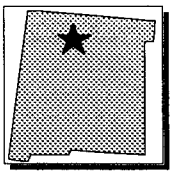
Environmental Restoration

- Updated Installation Work Plan for conducting environmental restoration and submitted it to the regulators in November 1991.
- Removed ten underground storage tanks in 1991.
- Submitted eight RCRA Facility Investigation (RFI) Work Plans to EPA for approval.
- Completed D&D on one reactor and assessment of two buildings.

Technology Development

- Developed and field-tested a portable mini-mass spectrometer for field screening of chemical samples.
- Established a Cooperative Research and Development Agreement with AWC/Lockheed to investigate magnetic separation combined with gravimetric separation to clean heavy metals from soils.
- Initiated work on the ATLAS line for treating transuranic wastes while minimizing the other resultant wastes.

ALBUQUERQUE FIELD OFFICE PROGRESS CHART LOS ALAMOS NATIONAL LABORATORY



	Task Description	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994
Corrective Activities and Waste Management	New Stack at LAMPF[a]			Title I	Title II	Construction complete
	SWSC Project		Title II	Construction complete		
	Hazardous Waste Treatment Facility	Concept design		Title I		
	RCRA Modifications					Complete site characterization
	Controlled Air Incinerator[b]	Upgrade activities				Startup activities
	Administratively Controlled Landfill			NEPA documentation		Construction complete
	MW Receiving and Storage Facility		NEPA documentation			Title I
	HE Wastewater Treatment System			Conceptual design		Title I
	MW Storage/Disposal Facility					
Environmental Restoration	Assessment	RFI workplan activity		Start RFIs		Finish RFI work-plans for 24 OUs
	Remediation	Conduct three RCRA closures	Complete 1 RCRA closure		Complete two RCRA closures	
	D&D Start		D&D of LAPRE	D&D of Buildings 3 and 4 South, TA-21	D&D of Phase Separation Pit	
	D&D Completion	D&D of UHTREX Reactor		D&D of LAPRE		D&D of Phase Separation Pit

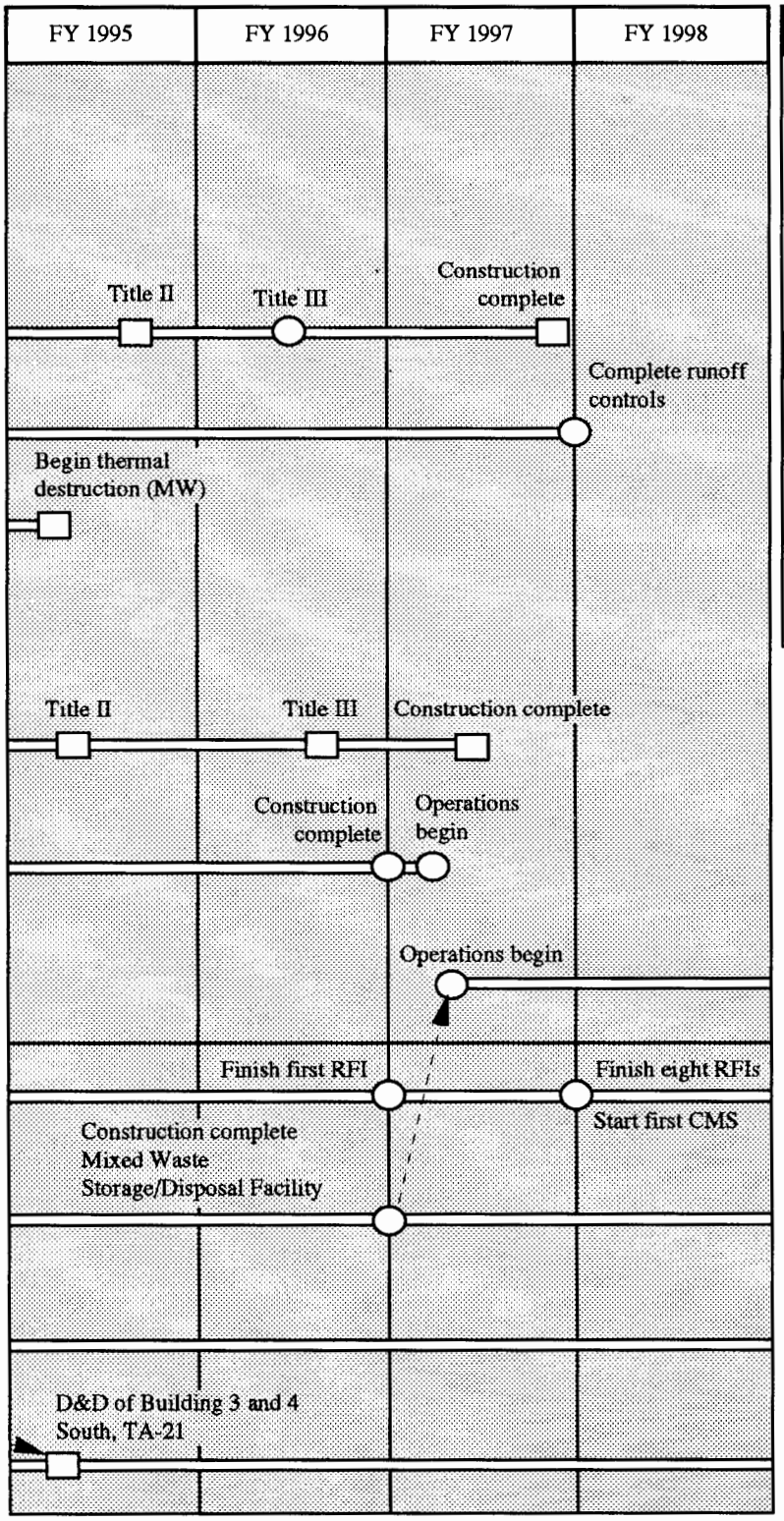
LOS ALAMOS NATIONAL LABORATORY

Long-Term Objectives

Bring active and standby facilities into compliance with air, water, and solid waste regulations.
Complete RFI/CMS for all OUs by FY 2002.
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 six RCRA closures by FY 1994.
Construct additional waste treatment, storage, and disposal facilities to manage wastes from current operations and cleanup of OUs.
Decommission 90 percent of identified surplus buildings.



Milestone Types

- ○ Unchanged from FY 1993–1997 FYP
- ◇ New since FY 1993–1997 FYP
- □ Changed from FY 1993–1997 FYP

Milestone Status

- ○ ◇ □ Planned
- ● ◆ ■ Complete
- 50 percent complete
- Information flow

Notes and Acronyms

[a] New stack at LAMPF
- regulatory delays (ADS 74)

[b] Controlled Air Incinerator
- regulatory delays (TDD 4170)

ADS -Activity Data Sheet
CMS -Corrective Measures Study
CWA -Clean Water Act
D&D -decontamination and decommissioning
FYP -Five-Year Plan
HE -high explosives
LAMPF -Los Alamos Meson Physics Laboratory
LAPRE -Los Alamos Plutonium Reactor Experiment
LLW -Low-Level Waste
MW -Mixed Waste
NEPA -National Environmental Policy Act
RFI -RCRA Facility Investigation
SWSC -Sanitary Wastewater Systems Consolidation
TA -Technical Area
TDD -Task Description Document
TRU -Transuranic Waste
UHTREX -Ultra-High Temperature Reactor Experiment

MAJOR MILESTONES

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
Corrective Activities			
• Complete construction of Hazardous Waste Treatment Facility.	FY 1993	FY 1997[1]	RCRA 40 CFR 288 B,C,D 40 CFR 260 A,B 40 CFR 285 B,Q
• Complete modifications to RCRA Firing Sites.	FY 1997	FY 1997	RCRA, CWA 40 CFR 125 40 CFR 265G
Waste Management			
• Begin construction of Radioactive Asbestos Burial Pit.	FY 1993	FY 1993[2]	NMSWR Part 105
• Restart of Controlled Air Incinerator.	FY 1993	FY 1995[2]	RCRA 40 CFR 268.42 TSCA 40 CFR 761.60, 65a
• Start operations at the Mixed Waste Receiving and Storage Facility.	FY 1994	FY 1997[1]	RCRA 40 CFR 268.42 RCRA 40 CFR 274
• Complete construction of High-Explosive Wastewater Treatment Facility.	FY 1997	FY 1996[3]	NPDES Permit FFCA Attach. 1 Sect. C 40 CFR 125
Environmental Restoration			
• Complete ten RFI Work Plans.	FY 1993	FY 1993	RCRA/HSWA 3004.u
• Complete four RFI Work Plans.	FY 1994	FY 1994	RCRA/HSWA 3004.u
• Complete one RFI Work Plan.	FY 1994	FY 1995[2]	RCRA/HSWA 3004.u
• Develop D&D Summary Site Plan.	FY 1992	4Q FY 1992	DOE Order 5820.2A
• Complete D&D of Buildings 3 and 4 South at Technical Area 21.	FY 1993	FY 1995[3]	DOE Order 5820.2A
• Complete D&D of phase separator pit at Technical Area 35.	FY 1996	FY 1994	DOE Order 5820.2A

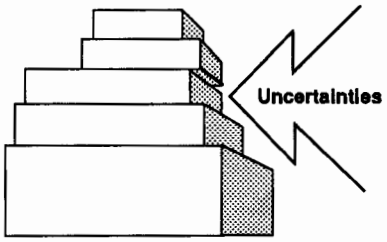
MAJOR MILESTONES (Continued)

	Schedule FY 1993–1997 Five–Year Plan	Schedule FY 1994–1998 Five–Year Plan	Regulatory Driver
Technology Development			
• Support investigation and demonstration of waste management and environmental restoration technologies.	New	1Q FY 1993	DOE Management Initiative

[1]Revised estimate based on better information on scope of project.
[2]Slipped because of reprioritization.
[3]Delayed for National Emissions Standards for Hazardous Air Pollutants compliance.

NPDES - National Pollutant Discharge Elimination System
CFR - *Code of Federal Regulations*
NMSWR - New Mexico Solid Waste Regulations

FIVE-YEAR PLAN ESTIMATES



There are a number of potential activities at the Los Alamos National Laboratory (LANL) that may affect program requirements. These potential activities have not been included in the estimates below due to various uncertainties regarding scope of work, the phasing of regulatory reviews and approval schedules, availability of technology, lack of independent cost reviews and other factors. At LANL, uncertainties in part relate to the startup of the Mixed Waste Receiving and Storage Facility, restart of the Controlled Air Incinerators, decontamination and decommissioning of Buildings 3 and 4 South of Technical Area 21, and D&D of Phase Separator Pit Technical Area 35. Startup of the Controlled Air Incinerator depends on acquiring a State part B permit. Other uncertainties include negotiation of the FFCA for LDR Waste, TRU drums not acceptably stored in inspectable RCRA arrays, D&D and transition of excess facilities. If further analysis of these uncertainties and potential additional work results in additional funding needs based on legal requirements, DOE will, through mechanisms such as reallocating budgetary resources, requesting funds through the normal appropriation process, supplemental requests or internal reprogramming, pursue funding for these activities, or where appropriate, based on technical reasons, enter into the formal conflict resolution process with regulatory bodies.

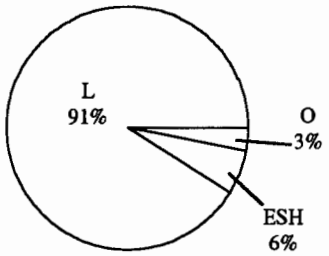
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Corrective Activities/Waste Management	63,667	87,086	92,763	100,244	109,936	120,597	123,394
Environmental Restoration	43,498	70,038	80,062	99,470	113,967	127,617	142,563
Facility Transition	0	4,500	4,500	4,600	4,600	4,600	4,600
Total	107,165	161,624	177,325	204,314	228,503	252,814	270,557

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites.

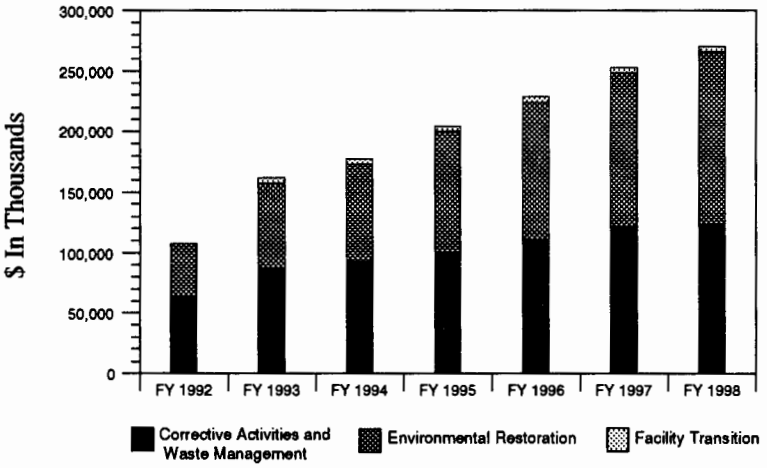
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



L- Legally Driven Requirements
ESH- Environment, Safety, and Health Requirements
O- Other Desirable Activities

Estimates by Year



For further information regarding Los Alamos National Laboratory, call (505) 845-5699.

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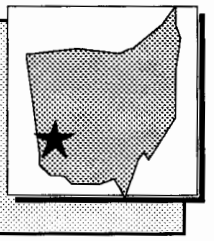
ALBUQUERQUE FIELD OFFICE
INSTALLATION SUMMARY
MOUND PLANT



DESCRIPTION

The Mound Plant is located within the southern city limits of Miamisburg in southwestern Ohio. The plant site occupies 306 acres of land overlooking Miamisburg and the Great Miami River. The Dayton metropolitan area is located ten miles northeast of the installation. Mound is an integrated research, development, and production facility operated by EG&G Mound Applied Technologies and performs work in support of DOE weapons and energy programs. Mound manufactures nonnuclear and tritium-containing components for DOE weapons.

STRATEGIC OUTLOOK

With the proposal to accelerate the consolidation of the nonnuclear component manufacturing activities associated with the nuclear weapons complex, as announced in the Secretary's press statement of December 16, 1991, a DOE Transition Planning Group is exploring options for the Mound Plant transition should a decision be made to terminate defense program activities. Implementation of any transition option is contingent on the findings of the Nonnuclear Consolidation Environmental Assessment, due to be completed in November 1992.

Operations at Mound generate sanitary, hazardous, radioactive, and mixed wastes. The Mound Environmental Restoration Program includes a CERCLA cleanup program and decontamination and decommissioning (D&D) activities. A Federal Facilities Agreement was negotiated with EPA in August 1990.

The long-range objective of the CERCLA program is to remediate all potential release sites to allow unrestricted land use. CERCLA remediation is expected to extend through 2007. The CERCLA program is driven entirely by a CERCLA Section 120 Federal Facilities Agreement signed August 6, 1990, by EPA and DOE. The CERCLA program is in the early phase of the Remedial Investigation/Feasibility Study (RI/FS) process. Two work plans will be completed for two of seven operable units (OUs) in FY 1992. The Records of Decision (RODs) for most of the OUs will be finalized in the mid-1990s.

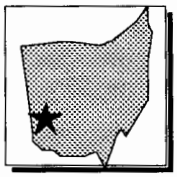
D&D operations began in FY 1978 and will continue until FY 2003. D&D activities are conducted solely under the jurisdiction of the Atomic Energy Act. Residual soil contamination after final D&D (to contamination levels that would allow unrestricted release) will be assessed under CERCLA, cleaned up under D&D, and verified under the CERCLA program driven by the Federal Facilities Agreement.

It is anticipated that Mound's low-level radioactive waste will be sent to the Nevada Test Site and that Mound's transuranic waste will be sent to the Waste Isolation Pilot Plant. Alternative storage sites for Mound's radioactive mixed waste include Nevada Test Site and Hanford. Hazardous waste will continue to be sent to a commercial treatment, storage, and disposal vendor. Solid sanitary wastes will continue to be sent to a local landfill.

ACCOMPLISHMENTS (FY 1991 – 3Q FY 1992)

- Project management methodology was initiated and improved so that Activity Data Sheets are now based on detailed work breakdown structures and resources tables.
- The waste minimization program was implemented. A formal waste minimization committee was established, and two pilot process waste assessments were completed.
- Title I design was completed for the radioactive waste storage facility. The Conceptual Design Report for the new Hazardous Waste Storage Facility was begun.
- The Mound waste operations included treatment of reactive hazardous waste and low-level liquid radioactive waste; storage of hazardous, radioactive and mixed waste; and disposal of hazardous waste. An application to dispose of low-level waste at the Nevada Test Site was approved.
- A significantly revised RCRA Part B Application and the Annual Report were submitted to EPA on schedule. Ohio EPA inspection resulted in no open findings.
- Three underground storage tanks were removed.
- The meteorological station upgrade has been completed and, after initial testing of the system, became fully operational in April 1992.
- Preliminary design of a new potable water system for backflow prevention and cross connection control was completed.
- Title I design was completed for the fuel oil storage tank upgrade.
- Completed West Powerhouse polychlorinated biphenyl removal action.
- Completed action to prepare a portion of the canal for railroad trestle repair.
- Completed Preliminary Evaluation of Remedial Action Technologies for three OUs.
- Completed sampling of radioactively contaminated soil in OU 6 where removals are under way or planned in the D&D program.
- Obtained EPA approval for OU 3 Quality Assurance Project Plan and Work Plan.
- Initiated fieldwork to collect data on potential release sites where little or no data are currently available (OU 3).
- Eliminated OU 8 by assigning underground tanks to various OUs based on geographic location.
- Drafted scoping reports for the sitewide RI/FS (OU 9). Eight reports were made final and placed in the public repository.
- Submitted proposal for investigative-derived material.
- Began excavation of Special Metallurgical (SM) Building annex's foundation and soil, characterized SM Building's stack and recommended decontamination for reuse; and removed SM leach field pipe lines (2016 feet).
- Removed remaining contaminated soil on waste transfer system project.
- Decontaminated one area in plutonium processing (PP) building.
- Submitted National Environmental Policy Act documentation for new projects.
- Issued D&D/CERCLA Interprogram Agreement on radiological/hazardous chemical soil remediation responsibilities.
- Issued D&D soil cleanup schedules to EPA and Ohio EPA.

ALBUQUERQUE FIELD OFFICE
PROGRESS CHART
MOUND PLANT



	Task Description	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994
Corrective Activities and Waste Management	Potable Water System			Complete system design		
	Fuel Oil Storage Tank Upgrade			Complete title and design		
	Meteorological Tower			System operational		
	Waste Minimization		Two assessments complete		Four assessments complete	
	RCRA Part B Permit			Submit Action Plan	Submit revisions to Part B Permit	
	NVO Application				Application for approval to ship D&D backlog to NTS approved	
	Characterize Oils			Characterization Plan prepared		
	Moratorium		Documentation submitted to DOE-HQ			
Environmental Restoration	Assess Waste Sites	Site Survey Report completed	RI/FS Work Plan for OU 1 completed	Complete RI/FS Work Plans on two additional OUs		Complete RI/FS OU1
	Decommission Buildings and Areas			Complete WTS decommissioning	Complete decomm. of PP bldg.	
	Conduct Waste Site Cleanups		Complete R Building nondefense areas		100% to off-site disposal; 0% to on-site disposal	Initiate OU 4 removal; Start cleanup of OU 1
Transition Activities	Planning			Establish working group	Complete plan and report to Congress	
	Building Characterization					

MOUND PLANT

Long-Term Objectives

Clean up all Operable Units by FY 2007.

Decommission all currently known surplus buildings by FY 2003.

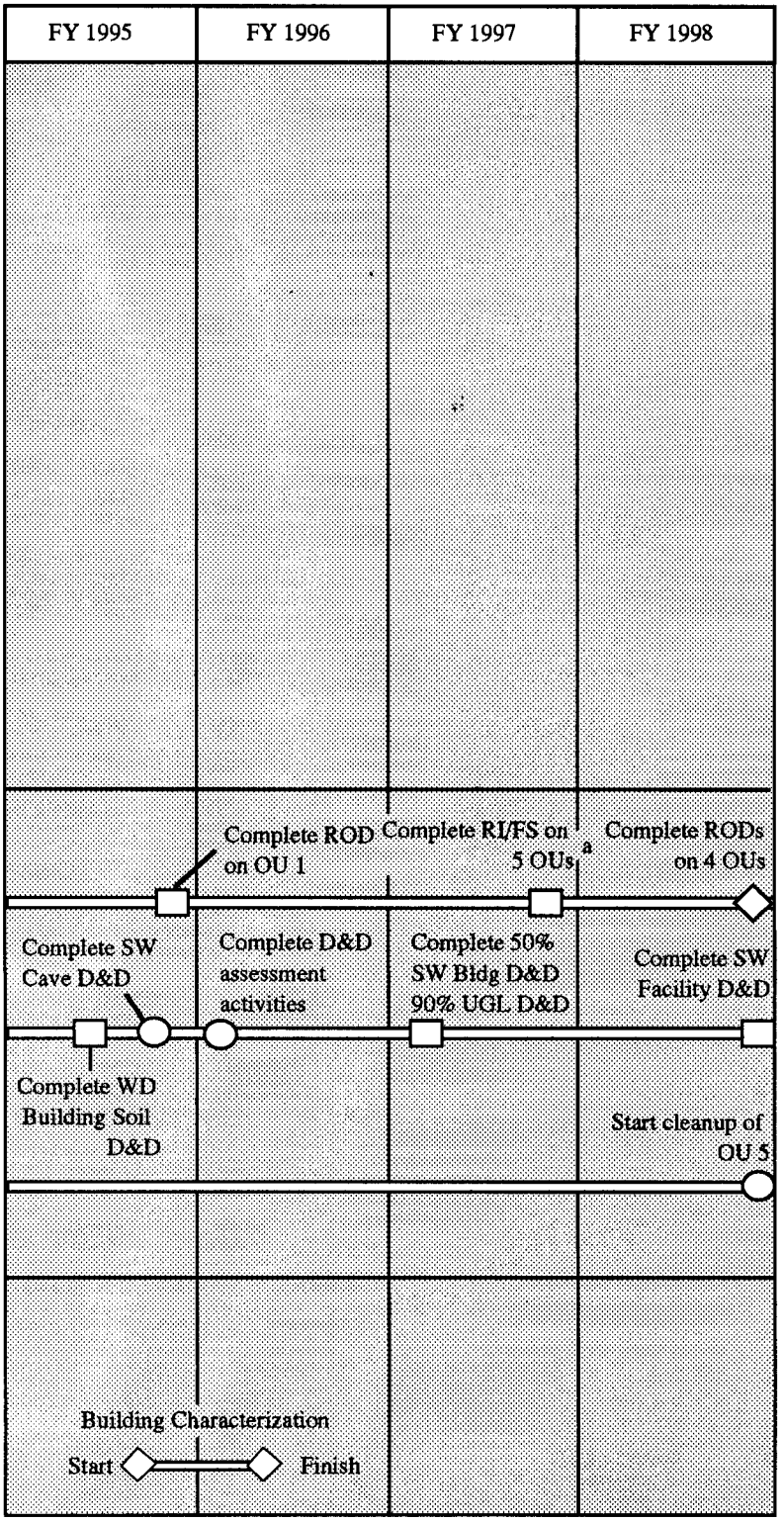
Five-Year Objectives

Complete RI/FS on four of seven Operable Units.

Decommission 78 percent of surplus buildings.

Start cleanup on two Operable Units.

Establish waste certification program per NVO-325, FY 1993.



Milestone Types

- Unchanged from FY 1993–1997 FYP
- New since FY 1993–1997 FYP
- Changed from FY 1993–1997 FYP

Milestone Status

- Planned
- Complete
- 50 percent complete
- Information flow

Notes and Acronyms

[a] Complete RI/FS on five of seven OUs. (one OU deleted)

D&D -decontamination and decommissioning
FYP -Five-Year Plan
DOE-HQ -DOE Headquarters
HWSF -Hazardous Waste Storage Facility
NVO -Nevada Operations
NTS -Nevada Test Site
OU -Operable Unit
PP -plutonium processing
RI/FS -Remedial Investigation/Feasibility Study
ROD -Record of Decision
RWSF -Radioactive Waste Storage Facility
SW -Semi-Works
UGL -underground lines
WD -waste disposal
WTS -Waste Transfer System

MAJOR MILESTONES

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
Corrective Activities and Waste Management			
• Characterize oils: prepare a plan for characterization of the waste oils.	4Q FY 1992	4Q FY 1992	40 CFR 268.9(a)
• Complete conceptual design for HWSF.	New	1Q FY 1993	RCRA 40 CFR 264.18(a)(b) 40 CFR 261.31
• Establish Waste Certification Program for NVO-325 requirements.	FY 1993	2Q FY 1993	NVO-325
• Complete construction of RWSF.	FY 1993	3Q FY 1993	DOE Order 5820.2A
Environmental Restoration			
• Complete RI/FS work plans on three OUs.	FY 1992	FY 1992	CERCLA Sect. 120, FFA
• Complete Area B ROD for OU 1.	FY 1994	FY 1994	CERCLA Sect. 120, FFA
• Begin cleanup on OU 1.	FY 1994	FY 1994	CERCLA Sect. 120, FFA
• Complete RI/FS assessments on five of seven OUs.	FY 1997	FY 1997	CERCLA Sect. 120, FFA
• Complete four RODs.	New	FY 1998	CERCLA Sect. 120, FFA
• Start cleanup of OU 5.	FY 1998	FY 1998	CERCLA Sect. 120, FFA
• Begin removal action in Miami-Erie Canal (OU 4).	New	FY 1994	CERCLA Sect. 120, FFA
Decontamination and Decommissioning			
• Complete the decommissioning of waste transfer systems.	FY 1992	FY 1992	CERCLA Sect. 120, FFA
• Complete the decommissioning of plutonium processing building.	FY 1992	1Q FY 1993[1]	DOE Order 5820.2A
• Complete assessment of underground lines to waste disposal building.	FY 1992	FY 1992	CERCLA Sect. 120, FFA
• Complete decommissioning of waste disposal building radioactively contaminated soil.	FY 1993	3Q FY 1995[2]	CERLCA Sect. 120, FFA
• Complete decommissioning of Sanitary Disposal Plant soils.	FY 1995	FY 1995	CERCLA Sect. 120, FFA

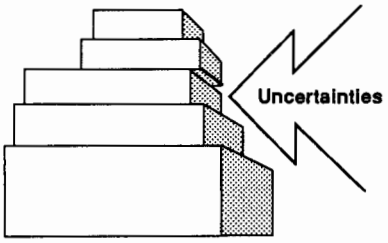
MAJOR MILESTONES (Continued)

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
• Complete the decommissioning of the Semi-Works Building Cave.	FY 1995	FY 1995	DOE Order 5820.2A
• Complete assessment of Building 21.	FY 1995	FY 1995	CERCLA Sect. 120, FFA
• Complete decommissioning of underground lines to Waste Disposal Plant.	FY 1997	FY 1998[1]	CERCLA Sect. 120, FFA
• Complete assessment of SW Building Cave.	New	FY 1993	DOE Order 5820.2A
• Complete assessment of Sanitary Disposal Plant soils.	FY 1992	FY 1992[2]	CERCLA Sect. 120, FFA
• Complete 56 percent of currently known radioactively contaminated soil area's decommissioning.	New	FY 1998	CERCLA Sect. 120, FFA
• Complete 78 percent of currently known surplus buildings decommissioning.	New	FY 1998	DOE Order 5820.2A
Transition Activities			
• Complete Draft Transition Plan.	New	4Q FY 1992	DOE Management Initiative
• Complete Final Plan.	New	1Q FY 1993	DOE Management Initiative
• Submit Transition Plan to Congress.	New	1Q FY 1993	DOE Management Initiative
• Implement Transition Plan.	New	TBD	DOE Management Initiative
• Begin building characterization.	New	3Q FY 1995	DOE Management Initiative
• Complete buildings characterization.	New	2Q FY 1996	DOE Management Initiative

[1]Delay in construction.
[2]Name correction from last plan.

CFR - *Code of Federal Regulations*
FFA - Federal Facilities Agreement
NVO - Nevada Operations

FIVE-YEAR PLAN ESTIMATES



There are a number of potential activities at the Mound Plant that may affect program requirements. These potential activities have not been included in the estimates below due to various uncertainties regarding scope of work, the phasing of regulatory reviews and approval schedules, availability of technology, lack of independent cost reviews and other factors. At Mound, uncertainties in part relate to the decommissioning of the Sanitary Disposal Plant and the Semi-Works Building Cave, the remediation of radioactively contaminated soil and additional program management of assessment, remediation and decontamination and decommissioning activities. The non-nuclear consolidation and FFCA negotiations are also uncertainties. If further analysis of these uncertainties and potential additional work results in additional funding needs based on legal requirements, DOE will, through mechanisms such as reallocating budgetary resources, requesting funds through the normal appropriation process, supplemental requests or internal reprogramming, pursue funding for these activities, or where appropriate, based on technical reasons, enter into the formal conflict resolution process with regulatory bodies.

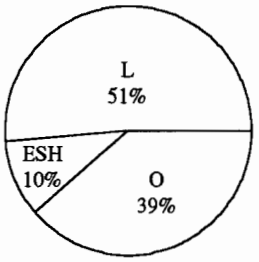
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Corrective Activities/Waste Management	7,476	9,629	12,787	13,813	15,147	16,615	16,972
Environmental Restoration	34,877	34,864	34,098	38,878	44,310	50,920	46,489
Facility Transition	0	1,000	1,000	1,000	1,100	1,200	1,250
Total	42,353	45,493	47,885	53,691	60,557	68,735	64,711

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites.

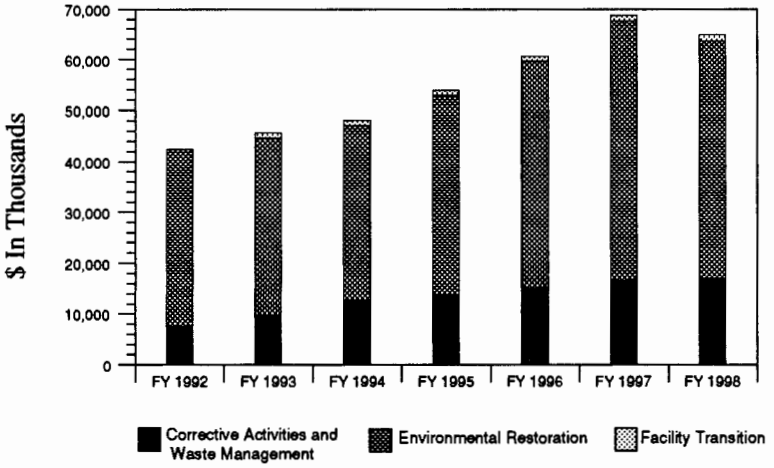
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



L- Legally Driven Requirements
ESH- Environment, Safety, and Health Requirements
O- Other Desirable Activities

Estimates by Year



For further information regarding Mound Plant, call (505) 845-5699.

ALBUQUERQUE FIELD OFFICE
INSTALLATION SUMMARY
PANTEX PLANT

DESCRIPTION

The Pantex Plant is located in the panhandle of Texas, about 17 miles northeast of downtown Amarillo and ten miles west of the town of Panhandle. Pantex includes a land area of about 16,000 acres. The total population within a 50-mile radius of the plant was 273,300 in 1990. 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. The facility's role within the nuclear complex is assembly, disassembly, and quality assurance of the weapons inventory. Pantex was proposed for inclusion on the CERCLA National Priorities List by EPA in July 1991.

STRATEGIC OUTLOOK

Waste management operations at Pantex, in the near term (FY 1996–1997), will add facilities to enhance capabilities to adequately handle existing waste streams. These new facilities for high explosive incineration and hazardous waste staging, treatment, and storage will be coupled with increased use of commercial off-site facilities to treat mixed waste streams. Together with existing capabilities, Pantex will achieve and maintain full regulatory compliance with applicable Federal, State, and local laws and regulations—principally their RCRA Part B Permit issued by the Texas Water Commission in April 1991. The long-range outlook (five–30 years) for Pantex indicates increased waste generation as a result of accelerated retirement of the weapons inventory. New waste-handling capacities may be required to meet this need. However, accurate projections cannot be made at this time.

Future Nuclear Weapons Complex activities at the Pantex Plant will be evaluated in the Reconfiguration Programmatic Environmental Impact Statement (PEIS). The scope of the weapons complex activities at Pantex may change from those of the present. However, no decisions will be made with regard to the future long-term mission of Pantex until completion of the Reconfiguration PEIS and issuance of the Record of Decision.

Environmental restoration activities at the Pantex Plant are being undertaken in compliance with a RCRA permit issued by the Texas Water Commission in April 1991. This permit incorporated activities that began in 1990 under a RCRA Section 3008 (h) Corrective Action Order on Consent. There are 144 Solid Waste Management Units (SWMUs) on-site that are organized into 16 Activities Data Sheets (ADSs). Assessment activities, which includes workplan development, are under way at all operable units. Field investigations are scheduled to begin at all operable units by October 1993. Investigations may involve sampling and testing of surface waters, sediments, and soils, and drilling of monitoring wells, depending on the specific area. Remedial activities at Pantex began in 1992, with closure of the Hypalon Pond. Other interim remedial actions are scheduled to begin in FY 1993 and FY 1994, with final remedial actions at all operable units scheduled for initiation in 1995 through 1997.

ACCOMPLISHMENTS (FY 1991 – 3Q FY 1992)

Corrective Activities

- Completed design of RCRA Waste and Hazardous Waste Staging Facilities.
- Completed removal of underground storage tanks.
- Purchased and installed portable storage units.

Waste Management

- Completed self-assessments in accordance with DOE Orders.
- Began weapons parts verification.
- Completed waste minimization engineering options for all major waste streams.
- Implemented Project Control System.
- Completed waste acceptance criteria.
- Initiated Contractor Waste Minimization Program.
- Completed Waste Management Plan for Environmental Restoration.
- Implemented Waste Certification Program.
- Shipped low-level waste to Nevada Test Site for disposal.
- Shipped mixed waste off-site for treatment.

Environmental Restoration

- Texas Water Commission RCRA Permit has been executed and is being implemented. All environmental restoration activities are in compliance with this permit.
- Eight RCRA Facility Investigation workplans were approved by the Texas Water Commission for six solid waste management units (SWMUs).
- Assessments of waste sites were initiated in April 1991.
- Initiated fieldwork for assessment of six sites (gas leaks, old sewage treatment plant, ditches and playas, former cooling tower, zone 12 groundwater, and fire training area burn pit).
- Remediation fieldwork and remedial actions for Hypalon Pond were completed.

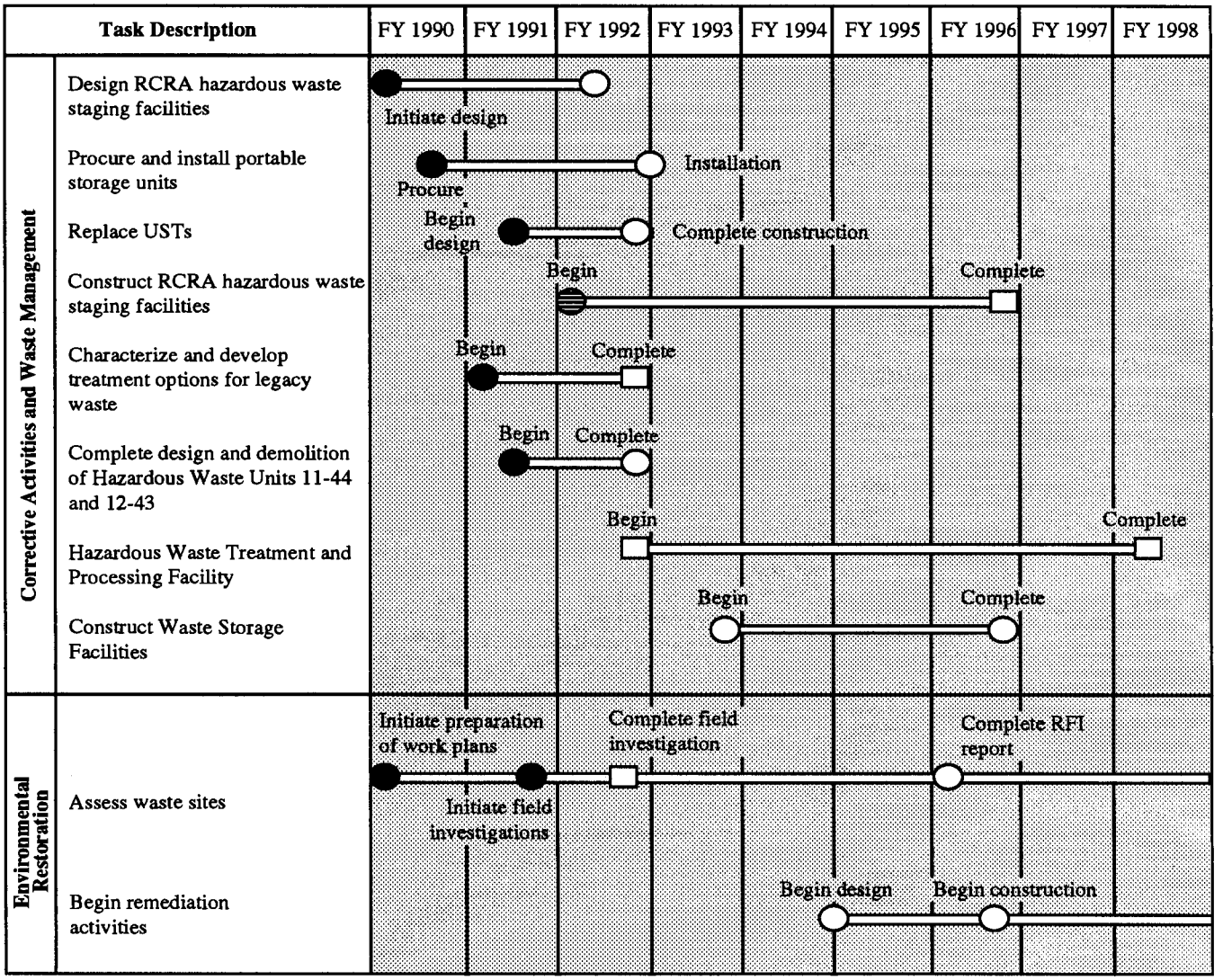
ALBUQUERQUE FIELD OFFICE PROGRESS CHART PANTEX PLANT

Long-Term Objectives

Complete assessment and remediation of all historic waste sites.
Upgrade waste management program.
Establish on-site treatment options.
Design waste minimization processes.
Develop treatment options on-site.

Five-Year Objectives

Complete all Environmental Restoration Program assessments.
Begin remediation activities.
Complete all known corrective actions before FY 1993.
Identify waste minimization and treatment options.
Monitor to verify regulatory compliance.
Track all chemicals.
Incorporate QA concepts into waste management procedures.



Milestone Types	Milestone Status
○ Unchanged from FY 1993–1997 FYP	○ ◇ □ Planned
◇ New since FY 1993–1997 FYP	● ◆ ■ Complete
□ Changed from FY 1993–1997 FYP	50 percent complete
	Information flow

Notes and Acronyms

FYP-Five-Year Plan
QA-quality assurance
RFI-RCRA facility Investigation
UST-underground storage tank

MAJOR MILESTONES

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
Corrective Activities			
• Complete replacement of underground storage tanks.	4Q FY 1992	4Q FY 1992	RCRA 40 CFR 280,281 A-G
Waste Management			
• Complete design and closure of Hazardous Waste Units 11-44 and 12-43.	4Q FY 1992	4Q FY 1992	RCRA 40 CFR 280,281 A-6
• Begin construction of High-Explosive Incinerator.	FY 1995	1Q FY 1997[1]	DOE Order 5400.3
• Complete construction of RCRA hazardous waste staging facilities.	1Q FY 1996	4Q FY 1996[2]	RCRA 40 CFR 264,265
• Complete construction of Hazardous Waste Treatment and Processing Facility.	4Q FY 1997	1Q FY 1998[2]	RCRA 40 CFR 262.34,264.34 268.40,1501.2
• Complete construction of containment structure.	New	4Q FY 1996	RCRA 40 CFR 262
Environmental Restoration			
• Begin design for remediation of waste sites.	4Q FY 1994	4Q FY 1994	RCRA Permit
• Complete field investigation of six sites.	2Q FY 1994	2Q FY 1994	RCRA Permit
• Begin remediation construction.	3Q FY 1996	3Q FY 1996	RCRA Permit
• Begin Corrective Measures Study Plan and Configuration Management (CM) on five Solid Waste Management Units (SWMUs).	FY 1994–1997	FY 1994–1997	RCRA Permit
• Begin CM construction on three SWMUs.	FY 1994–1997	FY 1994–1997	RCRA Permit
• Complete CM construction and documentation on one SWMU.	FY 1994–1997	FY 1994–1997	RCRA Permit
• Begin Interim Corrective Measures for nine SWMUs.	FY 1994–1997	FY 1994–1999	RCRA Permit
Technology Development			
• Support investigation and demonstration of waste component recycle, treatment, and disposal technologies.	New	1Q FY 1993	DOE Management Initiative

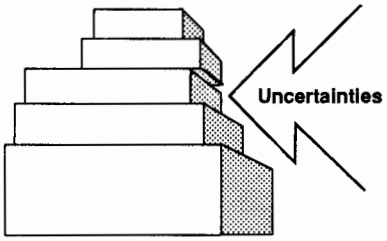
MAJOR MILESTONES (Continued)

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
• Support investigation and demonstration of waste management and environmental restoration technologies.	New	1Q FY 1996	DOE Management Initiative

[1]Slipped because technology is not available, and milestone has been changed from begin design to begin construction.
[2]National Environmental Policy Act schedule delays.

CFR - *Code of Federal Regulations*

FIVE-YEAR PLAN ESTIMATES



There are a number of potential activities at Pantex that may affect program requirements. These potential activities have not been included in the estimates below due to various uncertainties regarding scope of work, the phasing of regulatory reviews and approval schedules, availability of technology, lack of independent cost reviews and other factors. At Pantex, uncertainties are in part due to development of additional treatment technologies, increased project management related to quality assurance activities, additional decontamination and decommissioning activities and weapons dismantlement. If further analysis of these uncertainties and potential additional work results in additional funding needs based on legal requirements, DOE will, through mechanisms such as reallocating budgetary resources, requesting funds through the normal appropriation process, supplemental requests or internal reprogramming, pursue funding for these activities, or where appropriate, based on technical reasons, enter into the formal conflict resolution process with regulatory bodies.

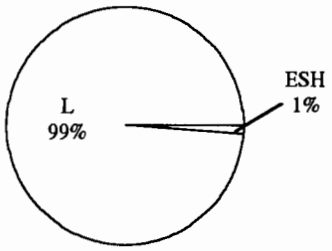
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Corrective Activities/Waste Management	17,881	16,800	18,405	19,881	21,802	23,915	24,428
Environmental Restoration	10,184	29,050	31,947	25,100	16,540	14,534	22,789
Total	28,065	45,850	50,352	44,981	38,342	38,449	47,217

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites.

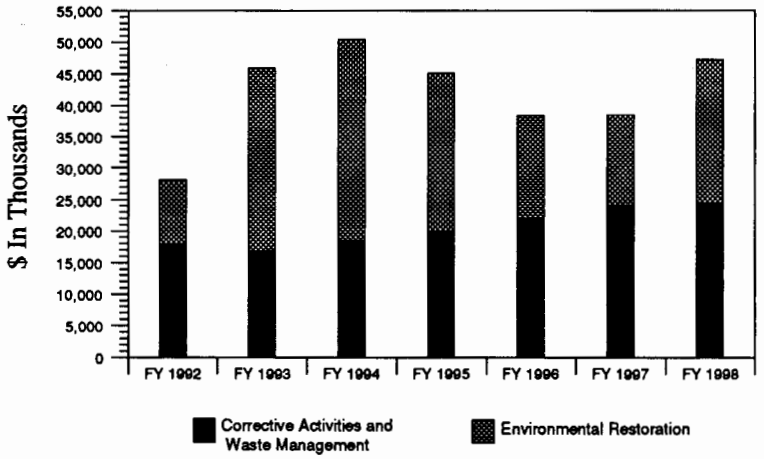
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



L- Legally Driven Requirements
ESH- Environment, Safety, and Health Requirements

Estimates by Year



For further information regarding Pantex Plant, call (505) 845-5699.

ALBUQUERQUE FIELD OFFICE
INSTALLATION SUMMARY
PINELLAS PLANT

DESCRIPTION

The Pinellas Plant occupies a 99.2-acre site approximately six miles north of St. Petersburg in Pinellas County, Florida. Pinellas County is located 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 the design, development, and production of special electronic and mechanical equipment for nuclear weapon applications. These products include neutron generators, specialty capacitors, thermal batteries, crystal resonators, oscillators, and clocks.

STRATEGIC OUTLOOK

The Waste Management Program serves the Pinellas Plant by performing on-site treatment and storage and off-site disposal of all wastes generated during the operation of the site. Continuity of operations provides the foundation elements necessary to complete the on-site treatment and storage and off-site disposal of hazardous and low-level waste. The construction of a new container/90-day storage facility has positioned waste management for any changes in waste generation.

Long-range plans are to continue to operate these facilities in compliance with all applicable Federal regulations and applicable operating permits. The Waste Management Program will continue to remain abreast of new technology developments in the areas of treatment, storage, and disposal, with special emphasis on waste source reduction or elimination. Programmatic work scheduling and cost development programs will assist in providing efficient and cost-effective means of waste control.

The Pinellas Plant Environmental Restoration Program is focused on remediating contaminated sites at the facility in an efficient and cost-effective manner. Restoration activities concentrate on those areas where contaminants exceed regulatory standards. Current activities at the Pinellas Plant are driven by the provisions stated in the plant's Hazardous and Solid Waste Amendments (HSWA 3004u) Permit issued in February 1990 by EPA Region IV. Activities have also been instituted to remediate an adjacent parcel of property formerly known as the 4.5-Acre Site.

Future nuclear weapons complex activities at the Pinellas Plant will be evaluated in the Reconfiguration Programmatic Environmental Impact Statement (PEIS). The scope of the weapons complex activities at Pinellas may change from those of the present. However, no decision will be made with regard to the future long-term mission of Pinellas until complex of the Reconfiguration PEIS and issuance of the Record of Decision.

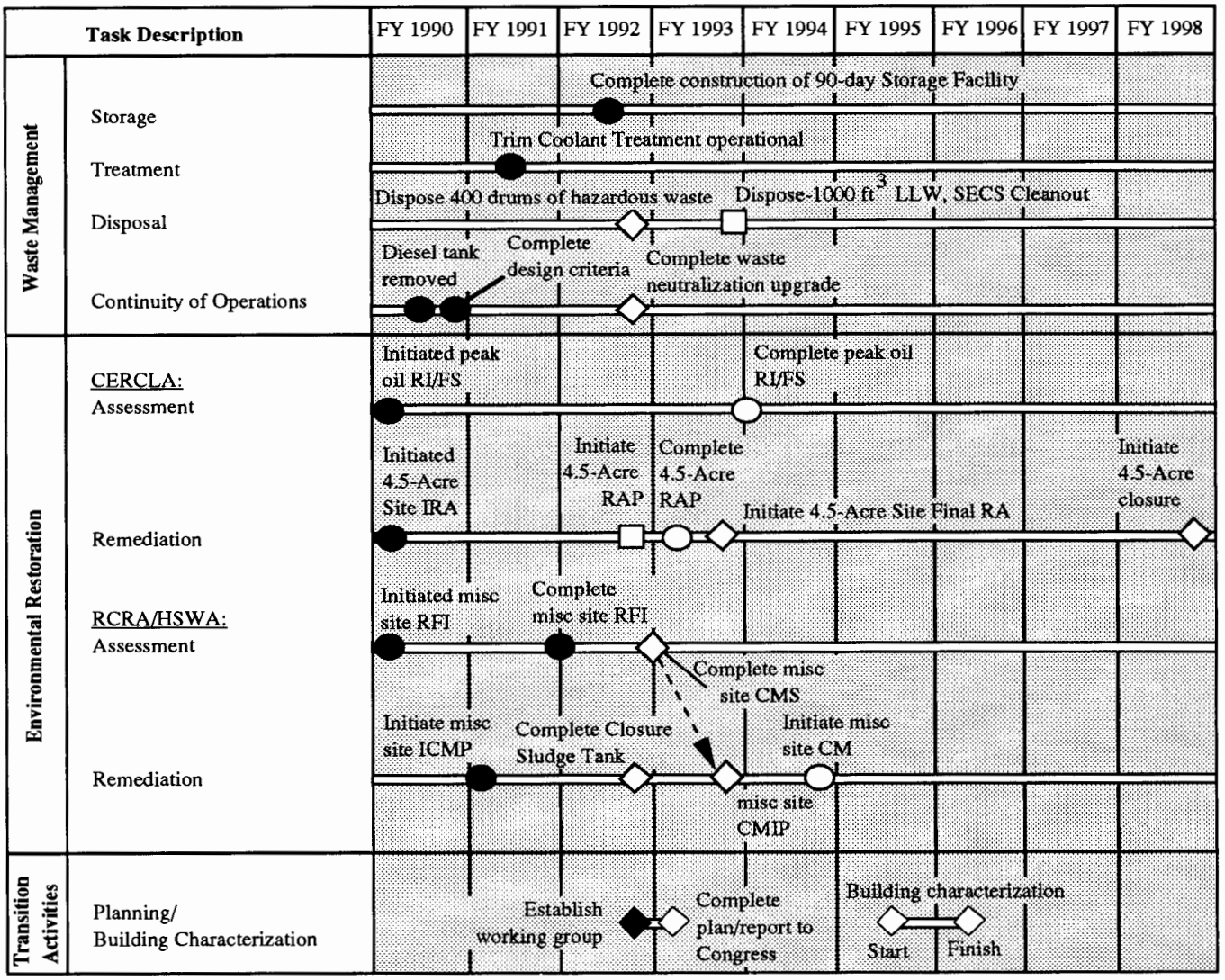
ACCOMPLISHMENTS (FY 1991 – 3Q FY 1992)

- Analyzed ongoing waste streams.
- Completed training required by Department of Transportation, Office of Safety and Health Administration, and EPA.
- Shipped hazardous and low-level waste for off-site disposal.
- Completed on-site treatment of hazardous waste.
- Implemented Interim Remedial Action to pump and treat contaminated groundwater at the 4.5-Acre Site.
- Interim Corrective Measures were implemented at one of the 15 solid waste management units included in the Miscellaneous Sites in a cost-effective manner (groundwater pumping and treating at the Northeast Site).
- Sludge holding tank closure plan was approved by the Florida Department of Environmental Regulation.
- Received EPA conditional approval of Miscellaneous Sites RCRA Facility Investigation Report, including no need for further characterization/assessment of the Floridan Aquifer.
- Began Corrective Measures Study for Miscellaneous Sites.
- Established a Transition Working Group.
- Completed construction of 90-day/container storage facility.

ALBUQUERQUE FIELD OFFICE
PROGRESS CHART
PINELLAS PLANT

Long-Term Objectives
Complete 4.5-Acre Site remediation by FY 1999.
Complete miscellaneous site remediation by FY 2014.

Five-Year Objectives
Fully characterize all sites.
Complete Interim Remedial Action for 85% of sites by FY 1998.
Initiate Remedial Action for 65% of sites by FY 1998
Complete all Source Remediation Actions by FY 1998.



Milestone Types	Milestone Status
○ Unchanged from FY 1993-1997 FYP	○ ◇ □ Planned
◇ New since FY 1993-1997 FYP	● ◆ ■ Complete
□ Changed from FY 1993-1997 FYP	50 percent complete
	Information flow

Notes and Acronyms

CM-Corrective Measures
CMIP-Corrective Measures Implementation Plan
CMS-Corrective Measures Study
FYP-Five-Year Plan
HSWA-Hazardous and Solid Waste Amendments
ICM-Interim Corrective Measures
ICMP-Interim Corrective Measures Plan
IRA-Interim Remedial Actions
LLW-low-level waste
RA-Remedial Action
RAP-Remedial Action Plan
RFI-RCRA Facility Investigation
RI/FS-Remedial Investigation/Feasibility Study
SECS-Stack Emission Control System

MAJOR MILESTONES

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
Waste Management			
• Dispose of 400 drums of hazardous waste.	New	4Q FY 1992	RCRA 40 CFR 262.10f
• Dispose of approximately 1000 cubic feet of LLW from Stack Emission Control.	4Q FY 1991	4Q FY 1993[1]	DOE Order 5820.2A
• Complete construction of Neutralization Facility Upgrade.	New	4Q FY 1992	Pinellas County Industrial Wastewater Users Permit
Environmental Restoration			
• Initiate 4.5-Acre Site Final Assessment Report.	4Q FY 1992	4Q FY 1992	CERCLA
• Complete 4.5-Acre Site Remedial Action Plan.	1Q FY 1993	1Q FY 1993	CERCLA
• Initiate Final Remedial Action (4.5-Acre Site).	New	4Q FY 1993	CERCLA
• Site Rehabilitation Levels Achieved (4.5-Acre Site).	New	4Q FY 1998	CERCLA
• Initiate Site Closure Activities (4.5-Acre Site).	New	4Q FY 1998	CERCLA
• HSWA Permit modification.	New	4Q FY 1992	EPA Permit[2] Section II.F
• RCRA Hazardous Waste Storage Tank Closure complete.	New	4Q FY 1992	FDER Permit Specific[3] Condition III.H
• Miscellaneous Sites Interim Corrective Measures Implementation Plan.	New	4Q FY 1993	EPA Permit[2] Section II.D
• Complete Miscellaneous Sites Corrective Measures Study.	New	4Q FY 1992	EPA Permit[2] Section II.E
Transition Activities			
• Complete First Draft Transition Plan.	New	1Q FY 1993	DOE Management Initiative
• Complete Final Plan.	New	1Q FY 1993	DOE Management Initiative
• Submit Plan to Congress.	New	1Q FY 1993	DOE Management Initiative

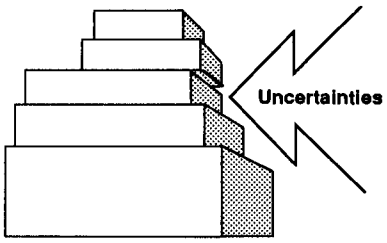
MAJOR MILESTONES (Continued)

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
• Begin Plan Implementation.	New	TBD	DOE Management Initiative
• Begin building characterization of Pinellas Plant.	New	FY 1995	DOE Management Initiative
• Complete building characterization of Pinellas Plant.	New	FY 1996	DOE Management Initiative

[1]Delay because stock material has not been removed. Defense Program Office is funding this effort.
[2]EPA Permit Number is FL 689 0090008.
[3]Florida Department of Environmental Resources (FDER) Permit Number is H052-159339.

CFR - *Code of Federal Regulations*
TBD - to be determined

FIVE-YEAR PLAN 1994 ESTIMATES



There are a number of potential activities at Pinellas that may affect program requirements. These potential activities have not been included in the estimates below due to various uncertainties regarding scope of work, the phasing of regulatory reviews and approval schedules, availability of technology, lack of independent cost reviews and other factors. At Pinellas, uncertainties are in part due to the need for additional treatment technologies and decontamination and decommissioning activities. If further analysis of these uncertainties and potential additional work results in additional funding needs based on legal requirements, DOE will, through mechanisms such as reallocating budgetary resources, requesting funds through the normal appropriation process, supplemental requests or internal reprogramming, pursue funding for these activities, or where appropriate, based on technical reasons, enter into the formal conflict resolution process with regulatory bodies.

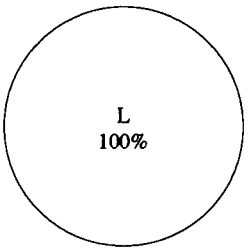
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Corrective Activities/Waste Management	1,782	2,572	2,593	2,801	3,072	3,369	3,442
Environmental Restoration	2,852	6,574	10,940	5,257	4,804	4,994	5,201
Facility Transition	0	200	200	553	743	1,018	1,050
Total	4,634	9,346	13,733	8,611	8,619	9,381	9,693

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites.

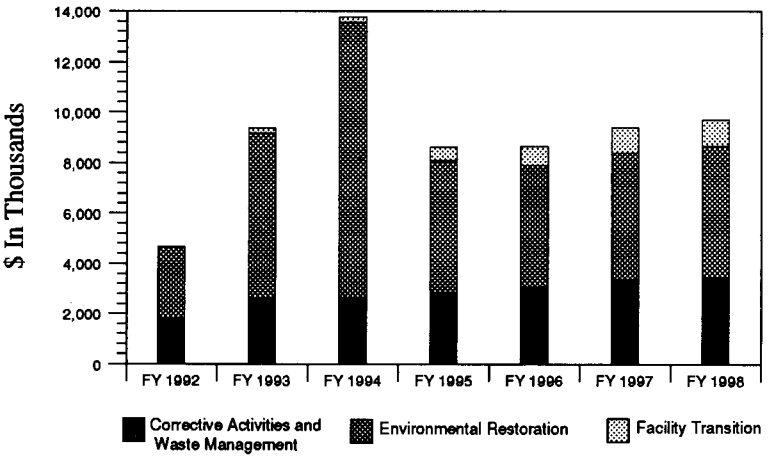
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



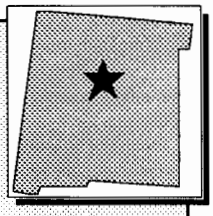
L- Legally Driven Requirements

Estimates by Year



For further information regarding Pinellas Plant, call (505) 845-5699.

ALBUQUERQUE FIELD OFFICE
INSTALLATION SUMMARY
SANDIA NATIONAL LABORATORIES–ALBUQUERQUE



DESCRIPTION

Sandia National Laboratories–Albuquerque (SNLA) is a research and development laboratory with a primary mission of developing, engineering, and testing nonnuclear components of nuclear weapons. SNLA's other areas of research and development include arms control, energy, environment, and other areas of strategic importance to national security. SNLA occupies several parcels of land covering 2820 acres within Kirtland Air Force Base directly south of Albuquerque, New Mexico. SNLA is also responsible for two off-site test areas, Tonopah Test Range (TTR) and Kauai Test Facility (KTF). TTR is located in Nevada and covers 640 square miles; KTF is located on the island of Kauai within the Navy's Pacific Missile Range.

STRATEGIC OUTLOOK

Chemical waste management at SNLA is now conducted as a mature, ongoing activity. Radioactive and mixed waste management is in early developmental stages. Several radioactive and mixed waste streams that meet waste acceptance criteria are collected and stored outside at an interim storage area on-site in Department of Transportation-approved containers. Radioactive and mixed waste not meeting criteria are stored at interim storage locations. Environmental restoration is in the early stages of site evaluation, with some site investigations under way. Pollution prevention and environmental monitoring activities primarily comprise waste minimization and monitoring as mandated by the Clean Air Act, Clean Water Act, RCRA and DOE Orders. Waste effluent monitoring for sanitary sewage is performed under permit from the City of Albuquerque. Storm sewer monitoring and surface discharges are covered by the New Mexico Water Quality Control Commission.

The strategic vision for these waste management activities in the five- to 30-year period calls for continued chemical, radioactive, and mixed waste management activities, which include the completion and operation of a low-level waste/mixed waste storage facility and the design and construction of a Consolidated Waste Management Complex (CWMC), which would provide a full range of collection, characterization, packaging, and storage functions. The CWMC is expected to be operational by FY 2004. Subsequent activities will include maintaining waste management facilities and managing programs in compliance with regulations. Waste minimization will work to decrease the number and volume of waste streams requiring disposal. Waste management activities at SNLA will remain flexible and responsive enough to (1) manage the broad variety of wastes that are generated by SNLA's university-like research and development operations, (2) meet the evolving needs of SNLA customers, and (3) maintain compliance with all regulatory agencies.

The Environmental Restoration Program is in the early stages of assessment activities. By the end of FY 1992, 36% of the operable units, consisting of approximately 46% of the known potential release and disposal sites, will have begun the assessment process. By the end of FY 1993, 96% of the operable units, comprising approximately 97% of the known potential release and disposal sites, will have begun the assessment process. Remediation of these sites will follow upon completion of assessment activities. Most of the SNLA sites will be assessed under the requirements of the Hazardous and Solid Waste Amendments Act portion of the RCRA Part B Operating Permit, as administered by EPA. The balance of the sites, most of which are at other Sandia-operated locations, will be assessed under CERCLA requirements as stipulated by DOE Order 5400.4.

STRATEGIC OUTLOOK (Continued)

The Transportation Technology Development Program, which is part of the EM Technology Development Program, will continue research to develop innovative technologies for transportation packaging and transport systems. This program will continue to perform engineering analyses and risk analyses associated with packaging and transportation using computer models developed by SNLA. Additional technology development, focusing on waste minimization, environmental restoration, and robotics will also continue.

As part of the DOE nonnuclear consolidation effort, SNLA is being considered as a potential recipient of additional nonnuclear manufacturing activities.

ACCOMPLISHMENTS (FY 1991 – 3Q FY 1992)

Corrective Activities

- The main trunk sewer line through SNLA's remote areas was completed in May 1991. Effluents previously discharged to septic tanks are now starting to be discharged to the city of Albuquerque publicly owned treatment works.
- A preconceptual design was completed for a liquid effluent control system in SNLA Technical Area V. After construction in FY 1992–1993, this system will collect potentially radioactive wastewater so that it can be tested for compliance before treatment and/or discharge to the city of Albuquerque Sanitary Sewer System.
- A fault system geophysics survey and analysis was completed February 28, 1992.

Waste Management

- An updated RCRA Part B Permit Application was submitted to the New Mexico Environment Department (NMED) in November 1990. The application was revised in response to that department's comments on the technical content.
- A draft RCRA Part B Permit was issued by the New Mexico Environment Department in July 1991. After a formal public hearing and revision of the Draft Permit, a formal operating permit will be issued.
- A bar code hazardous waste tracking system was implemented on a trial basis in February 1991 and implemented laboratory-wide in August 1991. The system allows generator-to-disposal tracking for SNLA chemical wastes.
- A Waste Minimization Program Plan was prepared December 30, 1991.
- The Chemical Exchange Program resulted in a savings of more than $72,000.
- A draft siting study, initiating the National Environmental Policy Act process, was prepared in FY 1991 for the line item, Consolidated Waste Management Complex.
- The Tiger Team Corrective Action Plan was prepared in FY 1991 and finalized in FY 1992.
- The first mixed waste inspection for the interim mixed waste storage site was successfully concluded in August 1991 without the receipt of a Notice of Violation. SNLA is responding to a New Mexico Environment Department letter of concern regarding storage practices.
- Procedures were formalized to ensure that radioactive waste is not inadvertently shipped off-site to commercial facilities.

ACCOMPLISHMENTS (Continued)

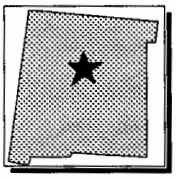
Environmental Restoration

- Preparation of work plans for the assessment of the nature and extent of contamination at a significant number of potential or known release and disposal sites continued or was started during FY 1992.
- Negotiations with EPA on the Hazardous Solid Waste Amendments Permit conditions were initiated and culminated upon the closure of the public hearing in March 1992.
- A cost and schedule system, which was initially implemented in FY 1991 to more rigorously control the Environmental Restoration Program, was further refined and applied to active projects.
- Development of new technologies continued with the trial application of prototype sonic drilling surface geophysics and horizontal drilling methods.
- Tiger Team Action Plans were prepared and are being implemented.

Technology Development

- Formed a task group to review and develop a National Environmental Policy Act (NEPA) strategy for transportation.
- Developed a program plan for the hazardous and mixed wastes needs assessment.
- Initiated development of the Survey of Transport of Radioactive Materials and the DOE Transportation Risk Study for support of the Environmental Analysis Document.
- Completed the Mosiak KfK Ductile Cast Iron drop tests (began phaseout of this program).
- Completed the development of the Mobile Instrumentation System trailer for radioactive material packaging tests.
- Fielded the Mobile Instrumentation System Trailer in Germany for support and benchmarking of the cask drop tests.
- Obtained certificate of compliance for the Beneficial Uses Shipping Systems Cask to ship cesium and strontium fluoride capsules.
- Initiated IAEA standards development for a structural evaluation criteria for safety series No. 37.
- Initiated a Transportation Integrated Demonstration Project focused on melting contaminated metal scrap into multipurpose, Type A packages.

ALBUQUERQUE FIELD OFFICE PROGRESS CHART SANDIA NATIONAL LABORATORIES–ALBUQUERQUE



	Task Description	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994
Corrective Activities and Waste Management	Sewer cross connection study			Start		Complete
	Final sitewide hydrologic study report			Start	Complete	
	Report of Air Emission Impact Baseline Study for SNLA			Start Complete		
	Report of Air Emission Impact Baseline Study for TTR				Start	Complete
	Transport and dispose of an estimated 165,000 kg of HW	362,000 kg disposed in FY 1991		Estimated 165,000 kg		Ongoing disposal of RCRA Waste
	Complete RCRA Operating Permit for HWMF	Draft RCRA Permit received July, 1991			Public hearing on proposed HWMF Permit	
	Transport/dispose of PCB waste	35,000 kg disposed in FY 1991			Estimated 30,000 kg	
	Prepare Mixed Waste Permits for RCRA	Part A		Closure/Contingency Plans prepared	Part B(3)	Part B Revisions
	Ongoing storage of MW/LLW				Interim site storage	Start 6920 operations
			Completed 12/91		Ongoing waste minimization planning	
Environmental Restoration	Continue field investigations of the Chemical Waste Landfill	Compliance Agreement			Closure-related activities	
	Begin remediation of the Chemical Waste Landfill					
	Coyote Canyon Blast Area assessment			Begin assessment	Prepare RFI Work Plan	RFI fieldwork
	Tech Area V assessment				Prepare RFI Work Plan	
	Liquid Waste Disposal System assessment		Prepare RFI Work Plan		RFI fieldwork	RFI Report
	Mixed Waste Landfill				DOE compliance activities	

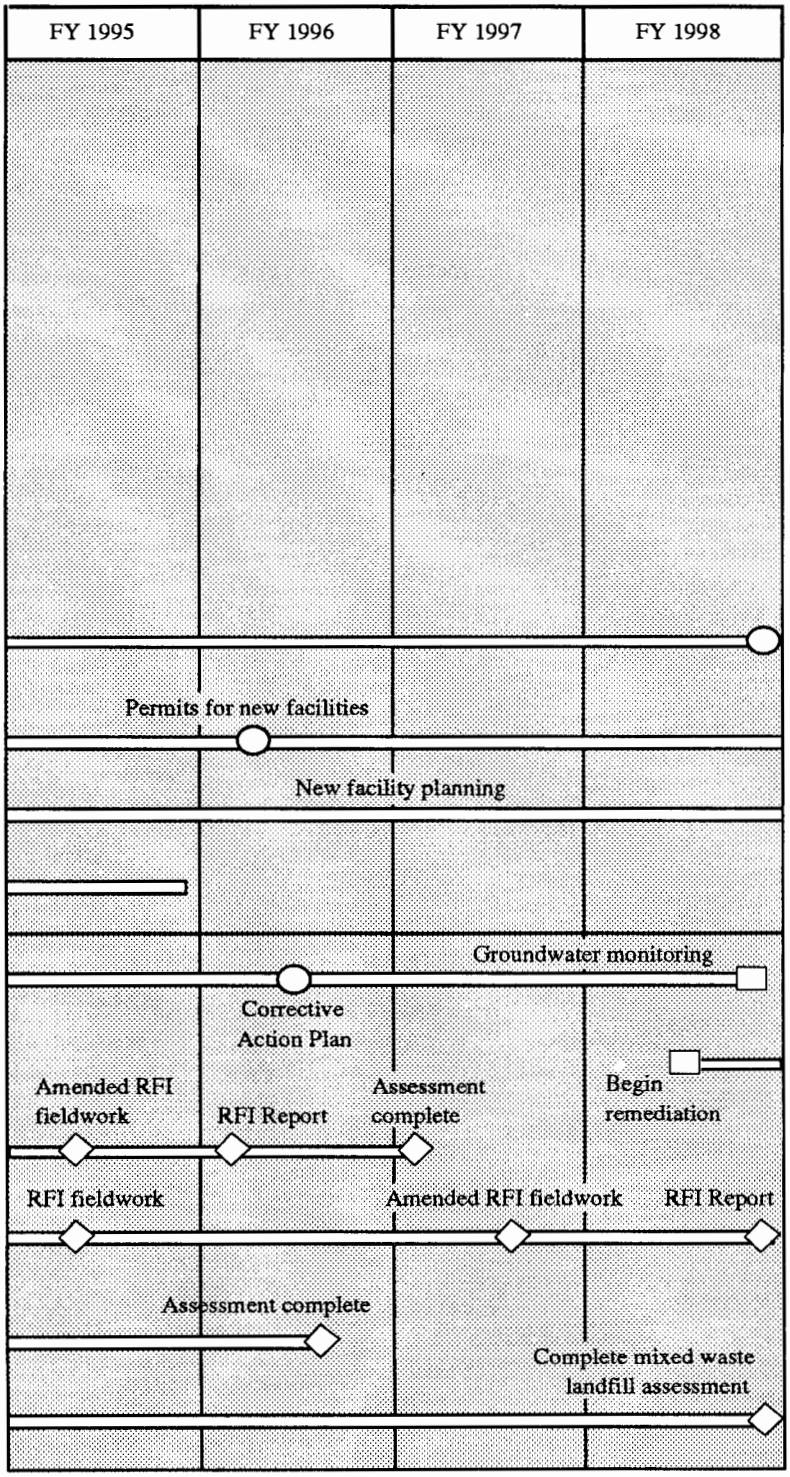
SANDIA NATIONAL LABORATORIES–ALBUQUERQUE

Long-Term Objectives

Dispose of asbestos through FY 1998.
Transport and dispose of hazardous waste.
Ongoing disposal of RCRA waste.
Implement Waste Management Program at Tonopah Test Range.

Five-Year Objectives

Complete RCRA operating permit for HWMF; public hearing on proposed HWMF permit.
Transport/dispose of PCB waste; 35,000 kg disposed of in FY 1991; est. 30,000 kg in FY 1992.
Dispose of non-regulated chemical waste ; estimated 260,000 kg in FY 1994.
Ongoing 6,000 ft^3 /year. storage of mixed waste/low-level waste; interim site storage FY 1990–mid-FY 1993; 6920 Operations new facility planning beginning mid-FY 1993.



Milestone Types

- Unchanged from FY 1993-1997 FYP
- New since FY 1993-1997 FYP
- Changed from FY 1993-1997 FYP

Milestone Status

- Planned
- Complete
- 50 percent complete
- Information flow

Notes and Acronyms

CMS -Corrective Measures Study
FYP -Five-Year Plan
HW -hazardous waste
HWMF -Hazardous Waste Management Facility
MW/LLW -mixed waste/low-level waste
PCB -polychlorinated biphenyls
RFI -RCRA Facility Investigation
TTR -Tonopah Test Range

MAJOR MILESTONES

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
Corrective Activities			
• Complete assessment of air emissions.	3Q FY 1992	4Q FY 1992[1]	40 CFR 61-H RCRA 3004.u
• Final Hydrogeologic Study Report.	New	2Q FY 1993	40 CFR 61-H RCRA 3004.u
• Baseline report for Tonopah Test Range air emissions.	New	2Q FY 1993	40 CFR 61-H
• Complete sewer cross-connection study (corrections to continue to FY 1995).	New	4Q FY 1993	40 CFR 122
• Complete design of Tech Area V Liquid Effluent Control System.	New	4Q FY 1992	DOE Orders 5480.4, 5400.5
• Begin construction of Liquid Effluent Control System for Tech Area V.	New	4Q FY 1993	DOE Orders 5480.4, 5400.5
Waste Management			
• Transport and dispose of 165,000 kg of hazardous waste.	4Q FY 1992	4Q FY 1992	40 CFR 262.34 11.601
• Implement chemical waste management program at SNLA and TTR.	4Q FY 1992	4Q FY 1992	40 CFR 262.34
• Dispose of an estimated 30,000 kg of PCB waste.	4Q FY 1992	4Q FY 1992	40 CFR 761
• Complete Annual PCB Activity Report for FY 1993.	New	4Q FY 1992	40 CFR 761
• Prepare application to ship LLW/MW resins to NTS.	New	4Q FY 1992	40 CFR 261.1 268.7 DOE Order 5820.2A
• Initiate LLW/MW program at Tonapah Test Range.	New	4Q FY 1992	40 CFR 282.11, 262.34 DOE Order 5820.2A
• Complete RMWMF outside area work.	New	TBD[2]	40 CFR 265.30
• Start preparation of three Part B Permit Applications (mixed waste).	New	1Q FY 1993	40 CFR 270.10 NMHWMR-8, Part 10

MAJOR MILESTONES (Continued)

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
• Dispose of 260,000 kg of nonregulated chemical waste.	New	2Q FY 1994	NMHWMR-3, Part 1.106
• Complete decontamination/sampling area of HWMF.	New	4Q FY 1994	40 CFR 265.75
Environmental Restoration			
• Continue field investigations at the Chemical Waste Landfill (CWL).	2Q FY 1997	3Q FY 1998[3]	RCRA Part 265 Closure Plan
• Begin remediation of the CWL.	2Q FY 1997	2Q FY 1998[3]	RCRA Part 265 Closure Plan
• Coyote Canyon Blast Area Assessment complete.	New	1Q FY 1997[4]	RCRA Permit
• Liquid Waste Disposal System Assessment complete.	New	2Q FY 1996[4]	RCRA Permit
• Mixed Waste Landfill Assessment complete.	New	4Q FY 1998[4]	RCRA Permit
• Tech Area V Assessment complete.	New	4Q FY 2000[4]	RCRA Permit
Technology Development			
• Continue Joint Defense Programs and EM waste minimization research and development program.	New	1Q FY 1993	DOE Management Initiative
• Support investigation and demonstration of waste management and environmental restoration technologies.	New	1Q FY 1995	DOE Management Initiative
Transportation			
• Complete RADTRAN 5.0 development.	New	FY 1996	DOE Management Initiative
• Test prototype hazardous and mixed waste packages.	New	FY 1995	DOE Management Initiative
• Code Case–Elastic-Plastic Design.	New	FY 1996	DOE Management Initiative
• Thermal Char Model Report.	New	FY 1994	DOE Management Initiative
• Test Report on Structural Response Evaluation.	New	FY 1996	DOE Management Initiative

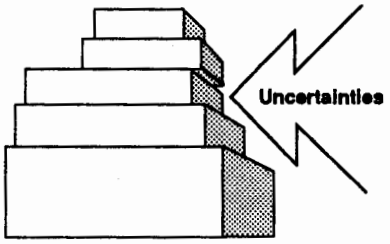
MAJOR MILESTONES (Continued)

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
• Operating Transportation Integrated Demonstration.	New	FY 1995	DOE Management Initiative
• Remote-Handling Demonstration and Report.	New	FY 1994	DOE Management Initiative

[1]Awaiting approval of Findings of No Significant Impact.
[2]Awaiting analytical results before assessment takes place.
[3]Additional tasks stipulated by the Compliance Agreement caused this milestone to slip by one year.
[4]FY 1993-1997 Five-Year Plan identified this milestone as conduct assessments at 133 sites by 4Q FY 1997.

CFR - *Code of Federal Regulations*
CWA - Clean Water Act
NMHWMR - New Mexico Hazardous Waste Management Regulation
TSCA - Toxic Substances Control Act
PCB - polychlorinated biphenyls
RMWMF - Radioactive Mixed Waste Management Facility

FIVE-YEAR PLAN ESTIMATES



There are a number of potential activities at Sandia National Laboratory–Albuquerque (SNLA) that may affect program requirements. These potential activities have not been included in the estimates below due to various uncertainties regarding scope of work, the phasing of regulatory reviews and approval schedules, availability of technology, lack of independent cost reviews and other factors. At SNLA, uncertainties are in part due to additional site assessment activities at several operable units, additional corrective actions at certain operable units, additional program management of decontamination and decommissioning activities and FFCA negotiations. If further analysis of these uncertainties and potential additional work results in additional funding needs based on legal requirements, DOE will, through mechanisms such as reallocating budgetary resources, requesting funds through the normal appropriation process, supplemental requests or internal reprogramming, pursue funding for these activities, or where appropriate, based on technical reasons, enter into the formal conflict resolution process with regulatory bodies.

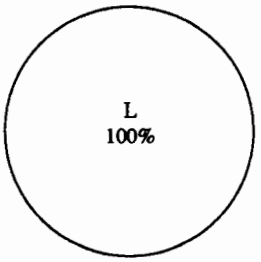
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Corrective Activities/Waste Management	20,179	18,290	20,829	22,500	24,674	27,057	27,638
Environmental Restoration	12,273	25,291	27,353	31,785	37,078	42,600	49,053
Total	32,452	43,581	48,182	54,285	61,752	69,657	76,691

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites.

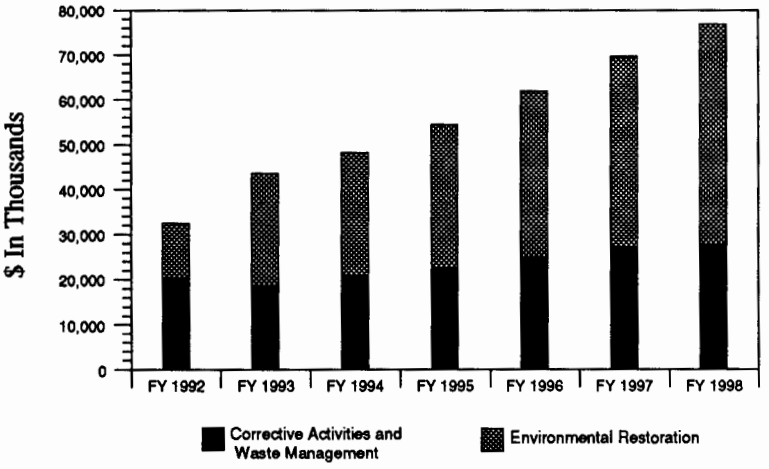
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



L- Legally Driven Requirements

Estimates by Year



For further information regarding Sandia National Laboratories–Albuquerque, call (505) 845-5699.

ALBUQUERQUE FIELD OFFICE
INSTALLATION SUMMARY
SANDIA NATIONAL LABORATORIES–LIVERMORE

DESCRIPTION

Sandia National Laboratories–Livermore (SNLL) is located about 40 miles east of San Francisco in the Livermore Valley, approximately three miles east of the Livermore city center. SNLL occupies about 413 acres of land. In 1988, the population within 50 miles was estimated at nearly six million. SNLL consists of research and development laboratories dedicated to the design and testing of nonnuclear components for nuclear weapons systems. A significant fraction of research and development at SNLL is devoted to energy-related programs in the Combustion Research Facility.

STRATEGIC OUTLOOK

The Waste Management Program is an ongoing operation at SNLL. Waste volumes will continue to be minimized as the changing Sandia mission allows. Long-term liability and costs will be reduced by consolidating and mixing waste streams and limiting land disposal. Procedure documentation and quality assurance/quality control will be increased to meet the regulatory and DOE requirements. Waste storage time limitations, except for low-level mixed waste, will be met. New treatment and disposal options will be pursued for all waste streams, but especially for low-level mixed waste. The Waste Management Program goal is to be in full compliance with all regulatory requirements yet minimize cost to the greatest extent possible.

The Environmental Restoration Program is composed of two major activities directed toward the remediation and assessment of two sites:

- The Fuel Oil Spill Site is an area that contains approximately 59,000 gallons of diesel fuel oil inadvertently discharged in 1975. The volume of contaminated soil is approximately 45 feet in radius and 112 feet in depth. In the spill area, the depth to groundwater is approximately 115 feet. Very low levels of benzene from the fuel oil have been detected in the groundwater at the Fuel Oil Spill. The preferred remedial action to be implemented is an innovative technology, in situ bioremediation.

- The Navy Landfill (NLF) Site encompasses 2.8 acres and 90,000 cubic yards. It was used by the Navy during and after World War II and by Lawrence Livermore National Laboratory (LLNL) in the 1950s and early 1960s. Historical records and earlier investigations determined that it contains mainly construction debris and machine turnings. The Solid-Waste Water Quality Assessment Test Report prepared by SNLL in 1990 has recommended that no further remedial activities are required at this site. However, to date, the California Regional Water Quality Control Board has not concurred on this recommendation and may require excavation and/or capping.

ACCOMPLISHMENTS (FY 1991 – 3Q FY 1992)

Corrective Activities

- Work on repair of tritium monitors has progressed since the decision to transition the Tritium Research Laboratory was made in August 1991. The solenoid manifold removal work has begun, and the process to purchase the two portable tritium monitors has begun.

Waste Management

- Part B Permit Applications for the Hazardous Waste Storage Facility and Incinerator were submitted.
- A formalized Waste Minimization Program has been developed. This program meets all regulatory requirements and addresses a Tiger Team finding.
- Procedures were formalized to ensure that radioactive waste is not sent off-site to commercial facilities inadvertantly.
- Three treatment units are being permitted to allow SNLL to further reduce waste volumes.
- Procedures have been reviewed to allow SNLL to dispose of low-level waste at the Nevada Test Site. An audit of these procedures is pending.

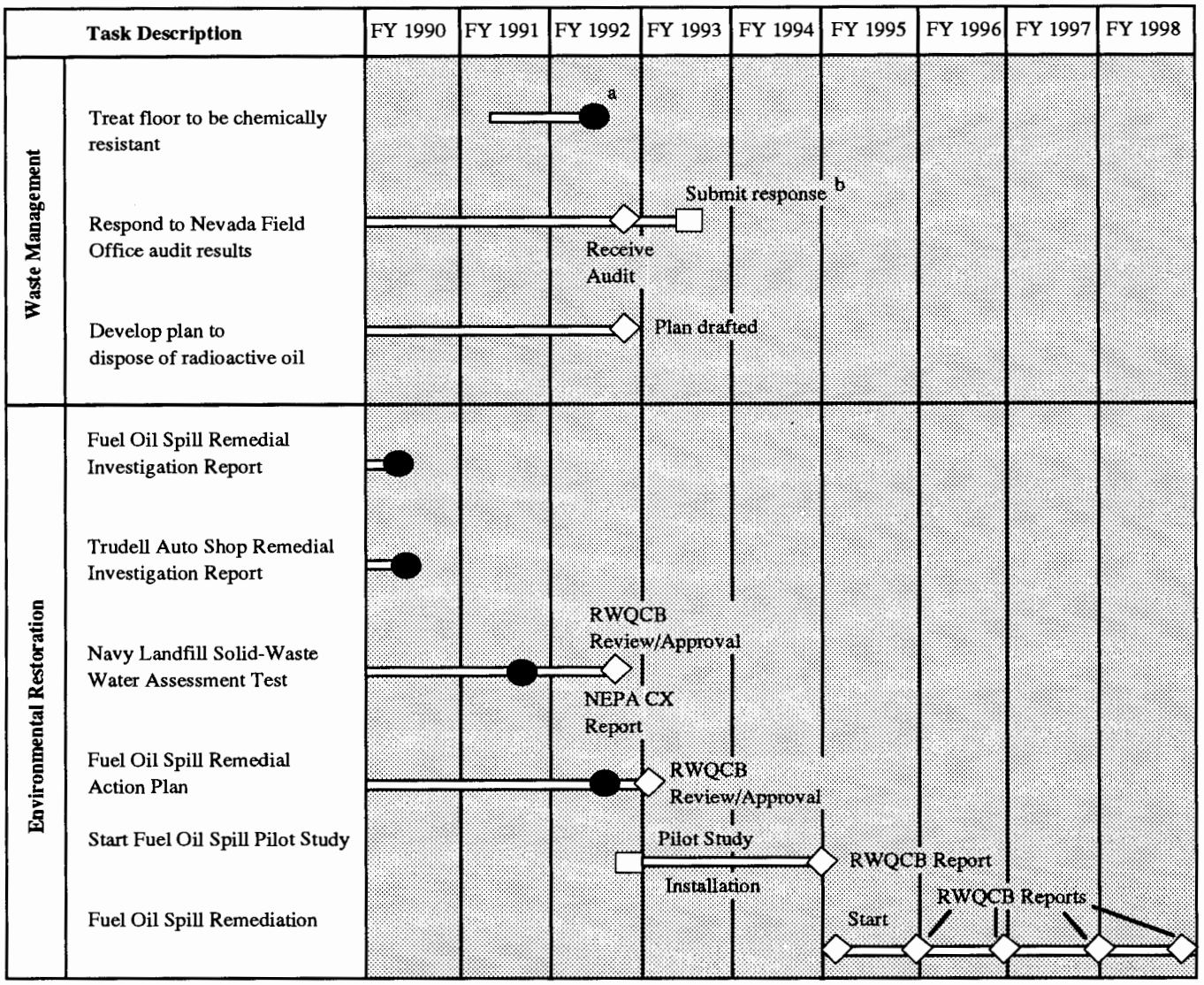
Environmental Restoration

- Completed the preliminary groundwater contaminant transport modeling for the Fuel Oil Spill.
- Completed the remedial investigation and report for the miscellaneous sites.
- Developed an auditable program management system for SNLL environmental restoration.
- Completed a remedial action plan for the Fuel Oil Spill.

ALBUQUERQUE FIELD OFFICE
PROGRESS CHART
SANDIA NATIONAL LABORATORY-LIVERMORE

Long-Term Objectives
Have disposal process in place for all waste streams by FY 2005.

Five-Year Objectives
Waste Management Program will be in full compliance with regulatory requirements yet minimize costs.



Milestone Types	Milestone Status
○ Unchanged from FY 1993–1997 FYP	○ ◇ □ Planned
◇ New since FY 1993–1997 FYP	● ◆ ■ Complete
□ Changed from FY 1993–1997 FYP	50 percent Complete
	Information Flow

Notes and Acronyms

[a] Two months early
[b] Nevada Field Office Audit was delayed until July 28-29, 1992. Response will be issued within 90 days of receipt of audit.

CX-Categorized Exclusion
FYP-Five-Year Plan
NEPA-National Environmental Policy Act
RWQCB-California Regional Water Quality Control Board

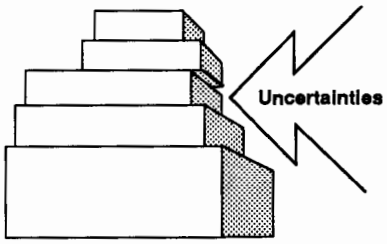
MAJOR MILESTONES

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
Waste Management			
• Upgrade the waste shipment emergency tracking system.	4Q FY 1992	4Q FY 1992	RCRA 40 CFR 64.70
• Conduct a solid waste audit.	New	4Q FY 1992	RCRA 40 CFR 264
• Analyze each waste stream annually in accordance with EPA SW-846.	New	4Q FY 1992	RCRA 40 CFR 270
• Respond to results of DOE Nevada Field Office audit and resubmit any plans that require revision for certification.	New	4Q FY 1992[1]	NVO-325
• Develop plan to dispose of radioactive used oil.	New	4Q FY 1992	DOE Order 5820.2A
Environmental Restoration			
• NEPA Categorical Exclusion (CX) Fuel Oil Spill Pilot Study.	New	4Q FY 1992	NEPA
• NEPA CX Navy Landfill (NLF).	New	4Q FY 1992	NEPA
• Start Pilot Study Remedial Action Plan.	New	4Q FY 1992	RWQCB
• RWQCB Construction Review, Fuel Oil Spill.	New	2Q FY 1993	RWQCB
• RWQCB Annual Report[2].	New	Annual	RWQCB
• NLF RWQCB Remedial Action Report.	New	1Q FY 1996	RWQCB
• Start Fuel Oil Spill Bioremediation.	New	1Q FY 1995	RWQCB
• Complete NLF Closure Report.	New	2Q FY 1995	RWQCB
• Complete Fuel Oil Spill Pilot Study.	New	4Q FY 1994	RWQCB

[1]Delayed three months pending audit.
[2]This is an annual milestone required to be completed in the fourth quarter of each fiscal year.

CFR - *Code of Federal Regulations*
NEPA - National Environmental Policy Act
NVO - Nevada Operations
RWQCB - Regional Water Quality Control Board

FIVE-YEAR PLAN ESTIMATES



There are a number of potential activities at Sandia National Laboratory–Livermore (SNLL) that may affect program requirements. These potential activities have not been included in the estimates below due to various uncertainties regarding scope of work, the phasing of regulatory reviews and approval schedules, availability of technology, lack of independent cost reviews and other factors. At SNLL, uncertainties are in part due to additional site assessment and corrective action at several operable units, additional technical fieldwork support, remedial activities and program management of decontamination and decommissioning activities. If further analysis of these uncertainties and potential additional work results in additional funding needs based on legal requirements, DOE will, through mechanisms such as reallocating budgetary resources, requesting funds through the normal appropriation process, supplemental requests or internal reprogramming, pursue funding for these activities, or where appropriate, based on technical reasons, enter into the formal conflict resolution process with regulatory bodies.

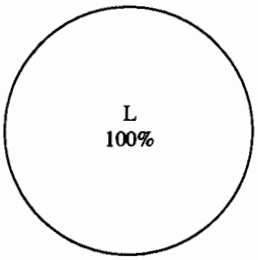
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Corrective Activities/Waste Management	2,441	1,866	2,464	2,355	2,582	2,840	2,901
Environmental Restoration	4,329	3,768	4,145	4,556	4,220	2,921	2,749
Tota	6,770	5,634	6,609	6,911	6,802	5,761	5,650

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites.

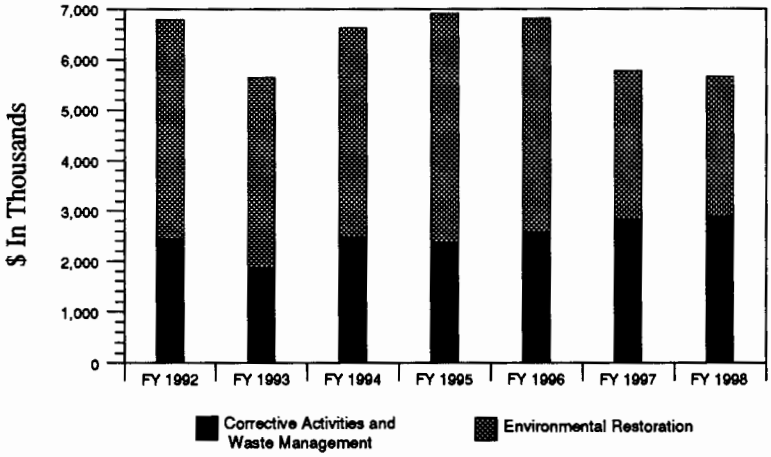
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



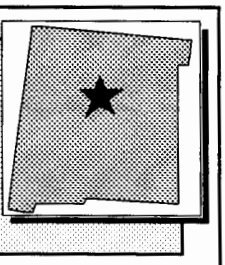
L- Legally Driven Requirements

Estimates by Year



For further information regarding Sandia National Laboratories–Livermore, call (505) 845-5699.

ALBUQUERQUE FIELD OFFICE
INSTALLATION SUMMARY
SOUTH VALLEY SITE



DESCRIPTION

The South Valley Site, located in the South Valley of Albuquerque, two miles west of Kirtland Air Force Base, is the location of a facility formerly owned by the Atomic Energy Commission and operated by ACF Industries from 1951 to 1967. During this time, electroplating, machining, painting, adhesive and degreasing operations related to weapons, reactors, and space programs took place at this facility. In 1967, the U.S. Air Force (USAF) took possession of the facility, which then was operated by General Electric (GE) to produce jet engines. GE purchased the facility in 1984 and is the current owner.

The groundwater is approximately eight to ten feet below the surface at the site. In 1980, the San Jose Well No. 6, an Albuquerque municipal well, was closed because of contamination with solvents. Seven independent investigations were negotiated by EPA with various entities. All investigations found contamination in groundwater under respective properties.

In September 1988, EPA signed Records of Decision for cleanup of three operable units (OUs). DOE, USAF and GE were named in December 1988 as potentially responsible parties for two OUs: San Jose Well No. 6 Site and the GE property (Plant 83). The Record of Decision for San Jose Well No. 6 called for additional studies, well abandonment, and 30 years of groundwater monitoring. The GE Plant 83 property has volatile organic compounds in the soil (vadose zone), the shallow groundwater, and the deep aquifers. The Record of Decision for Plant 83 calls for additional studies, vapor extraction of solvents from the vadose zone, and pumping and treating the contaminated groundwater in the shallow and deep aquifers. DOE, USAF, and GE attempted to negotiate an agreement to fund EPA's selected remedies. Because of the failure to reach an agreement after six months, EPA issued a CERCLA 106 Unilateral Order in 1989 against GE to implement the remedies. GE is currently implementing remedial actions, and USAF and DOE will pay for approximately 91% of the total costs. DOE is liable for 43.2% of the cleanup.

STRATEGIC OUTLOOK

The project continues to meet the requirements of the order and has completed soil-vapor surveys, soil borings, and monitoring wells. Current activities continue with additional monitoring wells being drilled as required by EPA.

Work will continue on the Plant 83 OU as required by the unilateral cleanup order issued to GE during FY 1989. As currently planned, this activity will extend, at least for monitoring activities, for about 30 years. Activity during the current year will include continuing efforts to define the edges of the contaminant plumes and remediation area. Work will involve shallow aquifer investigations, intermediate-to-deep aquifer investigations, soil remediation, shallow aquifer remediation, and intermediate and deep aquifer remediation. Results from recently installed monitoring wells indicate that the deep aquifer contamination is more widespread than originally anticipated. This will require additional characterization and consideration of alternative remedial scenarios. At San Jose Well No. 6, work will continue with sampling of the monitor well network, residential well sampling, installation of two additional 100-foot monitoring wells, and a well plugging/abandonment program.

Applicable Regulations: CERCLA and EPA Special Notice Letters identified DOE, USAF, and GE as potentially responsible parties liable for cleanup activities at Plant 83 and the San Jose Well No. 6 OUs. Applicable state regulations and DOE Orders are also considered.

Environment, Safety and Health Risks: Solvent contamination of the underlying aquifers is a potential health risk. Land uses in the area are residential and industrial.

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 was replaced by other municipal wells, the city wants to leave the well open so that it could be used in the future when the aquifer is remediated.

ACCOMPLISHMENTS (FY 1991 – 3Q FY 1992)

Environmental Restoration

- EPA issued a unilateral cleanup order to GE in July 1989 under CERCLA 106. The project continues to meet the requirements of the order.
- Soil-vapor surveys, soil borings, and monitoring wells were completed for the San Jose Well No. 6 OU.
- Current cleanup activities continue, and additional monitoring wells are being drilled as required by EPA for the Plant 83 OU.
- Access agreements are being obtained, and data are being gathered to seal and abandon wells in the San Jose Well No. 6 OU. Five wells remain to be plugged.
- Phase 1 of the Vapor Extraction System has been approved, and a pilot system is operating.

MAJOR MILESTONES

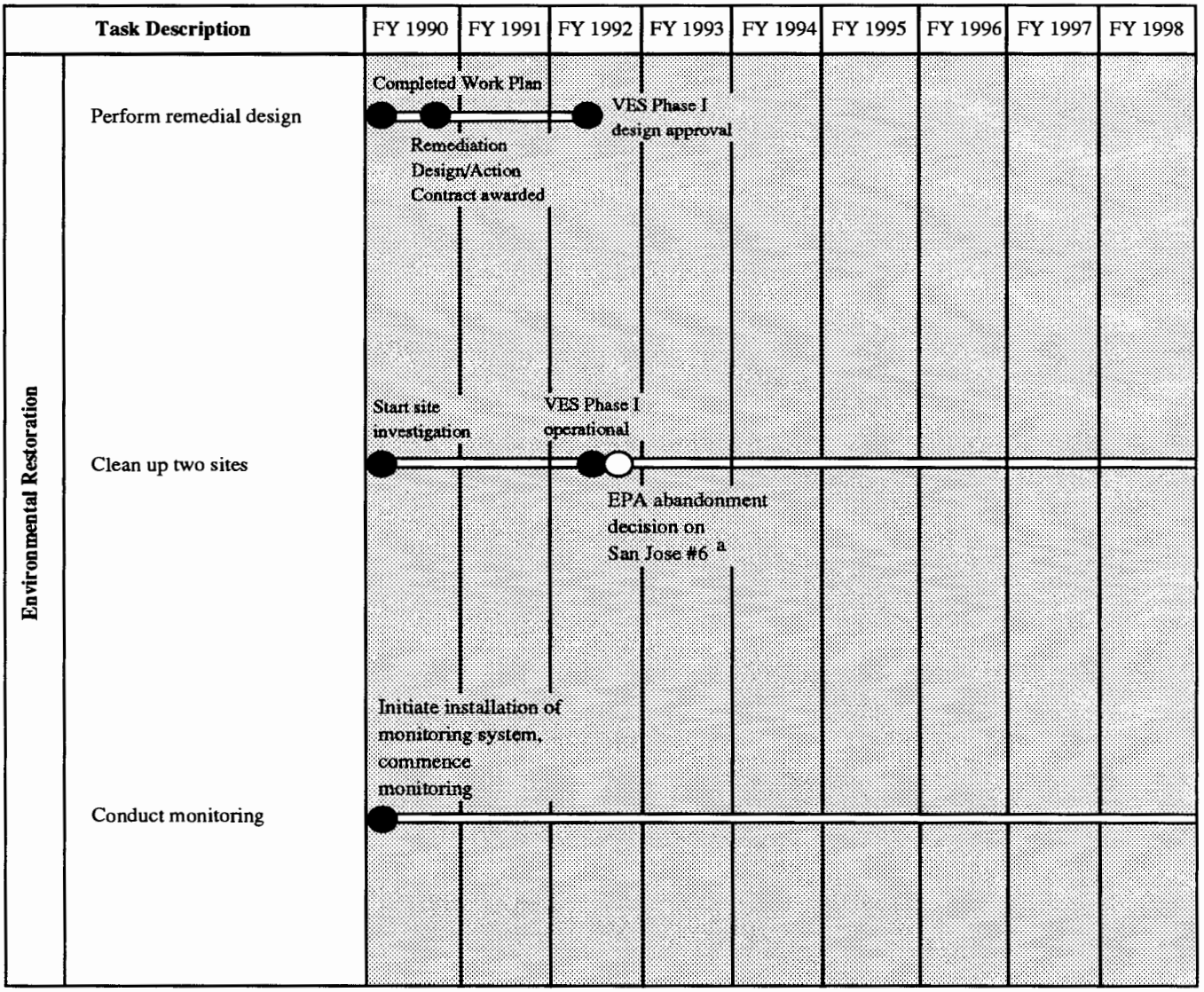
	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
• Complete Remedial Design/Remedial Action at GE Plant 83.	FY 2003	FY 2003	CERCLA 40 CFR Part 300
• Complete monitoring activities on the San Jos Well No. 6 OU.	FY 2019	FY 2019	CERCLA 40 CFR Part 300

CFR - *Code of Federal Regulations*

ALBUQUERQUE FIELD OFFICE
PROGRESS CHART
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 of GE Plant and San Jose Well.
Initiate 30-year monitoring.



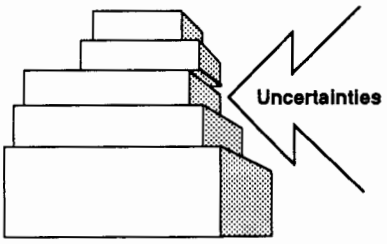
Milestone Types	Milestone Status
○ Unchanged from FY 1993–1997 FYP	○ ◇ □ Planned
◇ New since FY 1993–1997 FYP	● ◆ ■ Complete
□ Changed from FY 1993–1997 FYP	50 percent complete
	Information flow

Notes and Acronyms

FYP-Five-Year Plan
GE-General Electric
VES-Vapor Extractor System

[a] Ongoing negotiations with EPA and the City of Albuquerque.

FIVE-YEAR PLAN ESTIMATES



There are a number of potential activities at the South Valley Superfund Site that may affect program requirements. These potential activities have not been included in the estimates below due to various uncertainties regarding scope of work, the phasing of regulatory reviews and approval schedules, availability of technology, lack of independent cost reviews and other factors. At South Valley Superfund Site, uncertainties are in part related to potentially responsible parties for two operable units, the GE property (Plant 83) and San Jose property, and additional assessment studies related to remedial activities at the San Jose property. If further analysis of these uncertainties and potential additional work results in additional funding needs based on legal requirements, DOE will, through mechanisms such as reallocating budgetary resources, requesting funds through the normal appropriation process, supplemental requests or internal reprogramming, pursue funding for these activities, or where appropriate, based on technical reasons, enter into the formal conflict resolution process with regulatory bodies.

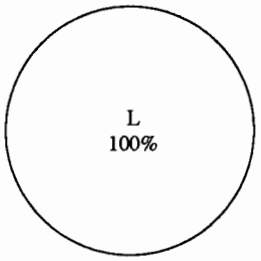
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Environmental Restoration	2,062	872	3,163	3,979	4,174	3,449	3,436
Total	2,062	872	3,163	3,979	4,174	3,449	3,436

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites.

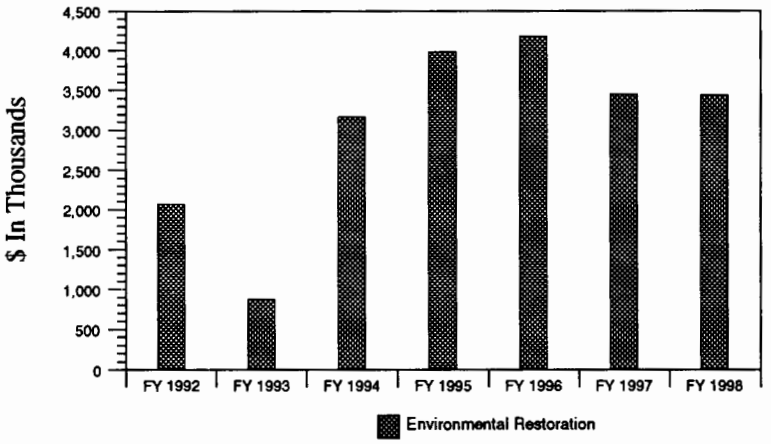
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



L- Legally Driven Requirements

Estimates by Year



For further information regarding South Valley Site, call (505) 845-5699.

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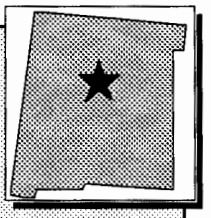
ALBUQUERQUE FIELD OFFICE
INSTALLATION SUMMARY
URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT



DESCRIPTION

In 1978 Congress directed DOE to remediate sandlike tailings from mineral processing located at 24 designated sites and at approximately 5000 vicinity properties in ten States and on two Indian Tribal lands. The tailings resulted from uranium production in the early 1950s through the early 1970s. The Uranium Mill Tailings Remedial Action (UMTRA) Surface Project, a major system acquisition project; and the UMTRA Groundwater Project, another major project, are treated as a single installation under the nondefense Environmental Restoration Program. Work on both projects was authorized when Congress passed the Uranium Mill Tailings Radiation Control Act (UMTRCA) of 1978, 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. UMTRCA provides that States pay ten percent of remedial action costs at sites within the States, while DOE pays the remaining cost. The Federal Government pays all cleanup costs for the four sites on Indian lands. The UMTRA Project Office is based in Albuquerque, New Mexico.

STRATEGIC OUTLOOK

The goal of these projects is to complete the Surface Project in 1998 and the Groundwater Project in 2014 in conformance with cleanup standards promulgated by EPA. Tailings surface remediation and groundwater remedial actions for each site include a Remedial Action Plan approved by the State or Tribe and the Nuclear Regulatory Commission (NRC); Environmental Assessment or Environmental Impact Statement (EIS); design/engineering, construction, surveillance and maintenance, and licensing approved by NRC.

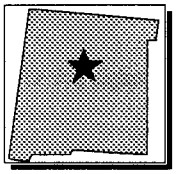
The primary goals as part of the Environmental Restoration Program are to

- achieve and maintain full regulatory compliance with applicable Federal, State, and local laws and regulations;
- complete the UMTRA Surface Project by September 1998;
- complete the UMTRA Groundwater Project by September 2014;
- assess the nature and extent of groundwater contamination at each of the 24 processing sites;
- reduce risk to the environment and to human health and safety through proactive cleanup actions;
- prevent the spread of contaminated groundwater plumes; and
- develop groundwater remedial action strategies.

ACCOMPLISHMENTS (FY 1991 – 3Q FY 1992)

- Surface remediation was completed for Durango, Colorado, in FY 1991.
- Surface remediation at Grand Junction, Colorado, continued in FY 1991 and was 51 percent complete by the third quarter FY 1992.
- Finding of No Significant Impact (FONSI) was published and surface remediation was initiated in FY 1991 for Lowman, Idaho, and remediation was completed during the third quarter FY 1992.
- Record of Decision was published for Rifle, Colorado, in FY 1991, and road improvements were made in preparation for a third quarter FY 1992 construction start.
- Phase I demolition of the mill buildings and disposal site preparation was completed at Gunnison, Colorado, in FY 1991, the FONSI was approved and published in March 1992, and remedial actions were initiated in the fourth quarter of FY 1992.
- A total of 275 vicinity properties were cleaned up at Grand Junction, Rifle, and Gunnison, Colorado; Mexican Hat, Utah; Lowman, Idaho; and Monument Valley, Arizona, in FY 1991.
- Surface remedial action started at Falls City, Texas, in January 1992.
- The UMTRA Project received its first site certification from the NRC for the Shiprock, New Mexico, site in FY 1991 for compliance with EPA standards.
- Interim (prelicensing) surveillance activities were carried out at eight completed disposal sites.
- Draft completion reports and final audit reports on the following sites were transmitted to NRC for review and comment: Lakeview, Oregon; Spook, Wyoming; Tuba City and Monument Valley, Arizona; and Durango, Colorado.
- Thirty-one public and task force meetings were held at nine different sites.
- The UMTRA Groundwater Project began in April 1991.
- UMTRA's Cost Reduction/Productivity Improvement Program (CR/PIP) reported a net benefit of $3.5 million in FY 1991. The project's goal for FY 1992 is $8.0 million; thru mid-FY 1992, $1.3 million had been reported.
- NRC concurred with site certification for the Spook, Wyoming, site in FY 1992.
- The Programmatic Environmental Impact Statement (PEIS) for the groundwater project was initiated in FY 1992.

ALBUQUERQUE FIELD OFFICE
PROGRESS CHART
URANIUM MILL TAILINGS REMEDIAL ACTION PROJECTS



	Task Description	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994
Environmental Restoration	UMTRA Surface:					
	Complete NEPA				All sites	
	Complete engineering				All sites	
	Start remediation		11 sites before FY 1992	FCT, RFL-2, MON, GUN, AMB	HAT	NAT, SRK-2, BEL, BOW, MAY
	Complete remediation		9 sites before FY 1992	LOW	MON	HAT
	Complete vicinity property remediation		4615 VPs before FY 1992	299	67	45
	Complete preparation for NRC licensing		5 sites before FY 1992	SPK	LKV, TUB, DUR	LOW
	Transfer to DOE LTSM					8 sites
	UMTRA Groundwater:					
	Initiate and complete PEIS					
	Start and complete baseline site characterization					
	Start detailed site characterization				1st site	
	Initiate remediation					
	Initiate supplemental standards application					
	Complete supplemental standards application					

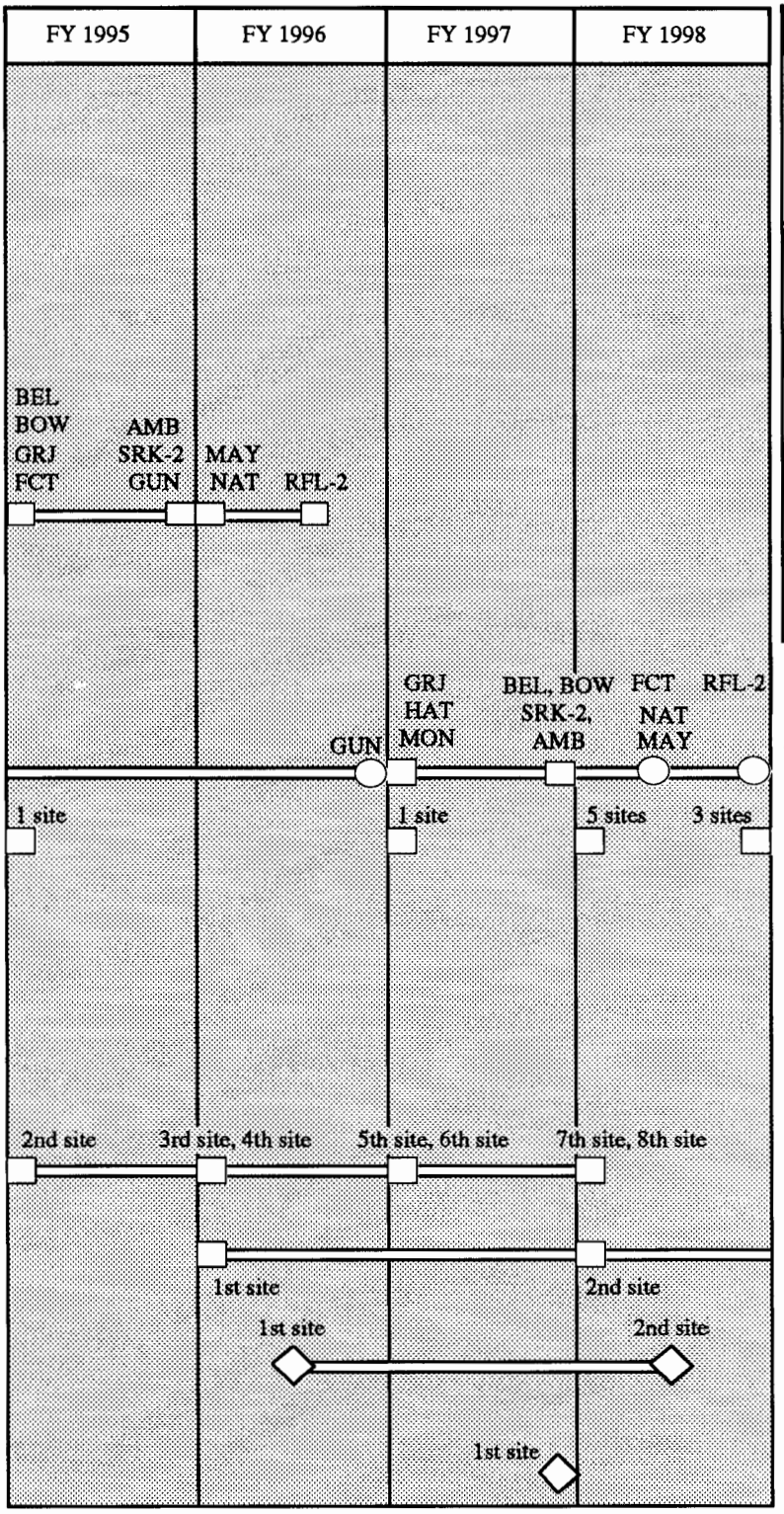
URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT

Long-Term Objectives

Clean up all surface tailings by end of FY 1996.
Certify all surface sites by end of FY 1998.
Obtain NRC license for all surface sites by end of FY 1998.
Clean up groundwater contamination by end of FY 2027.
Obtain NRC license of all groundwater sites by end of FY 2028.

Five-Year Objectives

Complete remedial action on 100 percent of surface sites.
Certify 100 percent of surface sites.
Complete groundwater compliance documentation at five sites where no active groundwater restoration is required.



Milestone Types

- Unchanged from FY 1993-1997 FYP
- New since FY 1993-1997 FYP
- Changed from FY 1993-1997 FYP

Milestone Status

- Planned
- Complete
- 50 percent Complete
- Information Flow

Notes and Acronyms

AMB -Ambrosia Lake, New Mexico
BEL -Belfield, North Dakota
BOW -Bowman, North Dakota
DUR -Durango, Colorado
FCT -Falls City, Texas
FYP -Five-Year Plan
GRJ -Grand Junction, Colorado
GUN -Gunnison, Colorado
HAT -Mexican Hat, Utah
LKV -Lakeview, Oregon
LOW -Lowman, Idaho
LTSM -long-term surveillance and maintenance
MAY -Maybell, Colorado
MON -Monument Valley, Arizona
NAT -Naturita, Colorado
NEPA -National Environmental Policy Act
NRC -Nuclear Regulatory Commission
PEIS -Programmatic Environmental Impact Statement
RFL -Rifle (two sites), Colorado
RVT -Riverton, Utah
SHP -Shiprock, New Mexico
SPK -Spook, Wyoming
SRK -Slick Rock (two sites), Colorado
TUB -Tuba City, Arizona
VP -vicinity properties

MAJOR MILESTONES

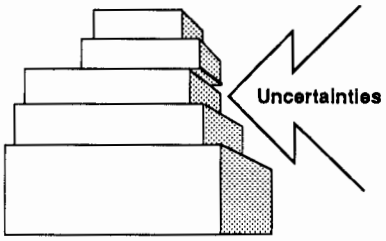
	Schedule FY 1993– 1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
Environmental Restoration			
• Resume surface remediation at Monument Valley, Arizona.	1Q FY 1992	4Q FY 1992	Public Law 95-604
• Complete 299 vicinity properties for UMTRA Surface Project.	4Q FY 1992	4Q FY 1992	Public Law 95-604
• Start surface remediation at Ambrosia Lake, New Mexico.	4Q FY 1991	4Q FY 1992[1]	Public Law 95-604
• Resume surface remediation at Mexican Hat, Utah.	1Q FY 1992	3Q FY 1993[1]	Public Law 95-604
• Complete surface remediation at Monument Valley, Arizona.	4Q FY 1993	4Q FY 1993	Public Law 95-604
• Complete 67 vicinity properties for the UMTRA Surface Project.	4Q FY 1993	4Q FY 1993	Public Law 95-604
• Complete Groundwater PEIS.	2Q FY 1994	2Q FY 1994	Public Law 95-604
• Complete all remaining surface NEPA documentation and site engineering.	4Q FY 1992	3Q FY 1993[2]	Public Law 95-604
• Start surface remediation at Belfield and Bowman, North Dakota/Naturita, Colorado/Slick Rock, Colorado/Maybell, Colorado.	3Q FY 1999/3Q FY 1998 3Q FY 1998/3Q FY 1998	3Q FY 1994[3] 3Q FY 1994[3]	Public Law 95-604 Public Law 95-604
• Complete Grand Junction vicinity properties for UMTRA Surface Project.	1Q FY 1994	1Q FY 1994	Public Law 95-604
• Complete surface remediation at Mexican Hat, Utah.	4Q FY 1993	4Q FY 1994[1]	Public Law 95-604
• Complete 45 vicinity properties for UMTRA Surface Project.	4Q FY 1994	4Q FY 1994	Public Law 95-604
• Complete surface remediation at Belfield and Bowman, North Dakota/Grand Junction, Colorado/Falls City, Texas.	4Q FY 1999/1Q FY 1995/ 4Q FY 1994	1Q FY 1995[4]	Public Law 95-604
• Complete surface remediation at Gunnison, Colorado/Ambrosia Lake, New Mexico/Slick Rock, Colorado.	4Q FY 1995/4Q FY 1994/ 4Q FY 1999	4Q FY 1995[5]	Public Law 95-604

MAJOR MILESTONES (Continued)

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
• Complete groundwater detailed site characterization at one site.	New	4Q FY 1995	Public Law 95-604
• Complete surface remediation at Naturita, Colorado/Maybell, Colorado.	4Q FY 2000/4Q FY 1999	1Q FY 1996[3]	Public Law 95-604
• Complete surface remediation at Rifle, Colorado.	1Q FY 2000	3Q FY 1996[3]	Public Law 95-604
• Issue PEIS Record of Decision for UMTRA Groundwater Project.	3Q FY 1994	4Q FY 1994[6]	Public Law 95-604
• Complete NEPA at first site for UMTRA Groundwater Project.	2Q FY 1995	4Q FY 1994[6]	Public Law 95-604
• Initiate Remedial Action at first site for UMTRA Groundwater Project.	1Q FY 1998	1Q FY 1996[6]	Public Law 95-604
• Complete baseline site characterization at all sites for UMTRA Groundwater Project.	4Q FY 1998	4Q FY 1994[3]	Public Law 95-604
• Complete groundwater characterization at two additional sites.	New	4Q FY 1995	Public Law 95-604
• Complete surface licensing by NRC and transfer all remaining disposal sites to DOE LTSM Programs.	4Q FY 2002	4Q FY 1998[3]	Public Law 95-604

[1]Delayed because of reprioritization.
[2]Delayed pending negotiation of disposal site location.
[3]Accelerated because of reprioritization.
[4]Acceleration of BEL/BOW; and delay in Falls City, occasioned by reprioritization.
[5]Acceleration for Slick Rock; and delay in Ambrosia Lake, occasioned by reprioritization.
[6]Milestone adjusted because of scope change.

FIVE-YEAR PLAN ESTIMATES



Congressional Authorization for UMTRA surface remediation expires at the end of FY 1994. Due to increased regulatory requirements, higher than expected quantities of contaminated materials at some sites, and funding shortfalls in earlier fiscal years, the project cannot be completed by that date. However, legislation now pending before Congress would extend authorization through the end of FY 1998. The current plan for surface cleanup assumes that extension will be enacted. DOE will request funding consistent with project completion in FY 1998.

The UMTRA Ground Water Project does not have a time limitation. During FY 1992 the Ground Water Project was restructured to achieve regulatory compliance in a much more time- and cost-effective manner. As a result of this replanning, total estimated project costs have been reduced from a range of $1.3 billion to 1.9 billion to less than $600 million, and project duration has been reduced from 37 years to 24 years. This approach will be presented to the States, Tribes, and local communities in a series of scoping meetings on the UMTRA Groundwater PEIS. Comments will be solicited to ensure that the plan reflects public concerns.

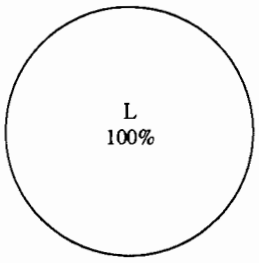
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Environmental Restoration	141,900	147,700	115,600	88,900	16,000	9,300	20,200
Total	141,900	147,700	115,600	88,900	16,000	9,300	20,200

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites.

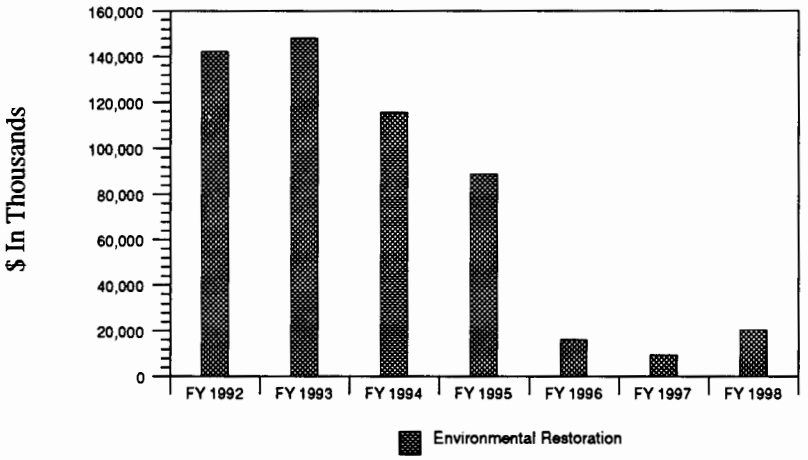
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



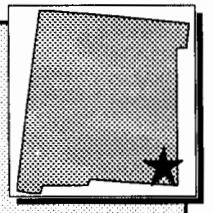
L- Legally Driven Requirements

Estimates by Year



For further information regarding Uranium Mill Tailings Remedial Action Projects, call (505) 845-5699.

ALBUQUERQUE FIELD OFFICE
INSTALLATION SUMMARY
WASTE ISOLATION PILOT PLANT



DESCRIPTION

The Waste Isolation Pilot Plant (WIPP), located 26 miles east of Carlsbad, New Mexico, is a research and development facility with the mission of demonstrating the safe disposal of radioactive transuranic (TRU) waste resulting from U.S. defense activities and programs. WIPP is the only facility in the United States specifically designed and constructed for the long-term storage of TRU wastes. WIPP is essential to solving the growing problems of how to safely and efficiently dispose of radioactive waste in an environmentally sound manner.

STRATEGIC OUTLOOK

DOE has made a commitment that no waste will be permanently emplaced in WIPP until compliance with the applicable regulations of EPA has been determined. These regulations are the environmental standards for the management and disposal of TRU wastes (40 CFR Part 191) and the land disposal requirements of RCRA as amended. To demonstrate compliance before permanent emplacement, DOE decided to develop WIPP in phases. Surface facilities are built and considerable underground excavation has been completed. The Secretary declared WIPP ready to begin testing with TRU waste in October 1991. However, a lawsuit prevented shipments of waste to WIPP due primarily to lack of a legislative land withdrawal. On October 30, 1992, the President signed into law the WIPP Land Withdrawal Act, P.L. 102-579, which permanently withdrew the lands surrounding WIPP and allows the WIPP Test Phase with waste to proceed provided that a number of EPA and other agency approvals and certifications are obtained. WIPP is now in the test phase, which consists of performance assessment, the test program, and the decision process. Although extensive studies of the site and WIPP performance have not identified any attributes that would disqualify WIPP as a repository, more information is needed to reduce uncertainties in predicting long-term performance, including compliance with the EPA regulations. To date, the collection of data for WIPP has been conducted through field tests at the site, studies performed in WIPP underground excavations, and laboratory experiments using surrogate waste. No tests with actual TRU waste have been conducted to study the behavior of the waste or its interactions in the repository environment. During the test phase, however, tests with actual TRU waste will be conducted. These latter tests, expected to last five-to-seven years, may proceed as early as August 1993, following EPA's approval of the WIPP Test Phase Plan and Waste Retrieval Plan and other prerequisites mandated by the Act. The test phase will end when a decision is made to begin disposal or to abandon WIPP if regulatory compliance cannot be determined. If the decision is made to proceed, permanent disposal of TRU wastes at WIPP will be completed over a 20-year operating period. WIPP will provide a safe disposal alternative for TRU waste from DOE facilities at Rocky Flats, Idaho, Hanford, Savannah River, Oak Ridge, Mound, Los Alamos National Laboratory, Lawrence Livermore National Laboratory, and Nevada.

DOE is working deligently with all involved agencies to obtain the required approvals and certifications so that shipments of Test Phase waste, starting with INEL waste, can begin.

ACCOMPLISHMENTS (FY 1991 – 3Q FY 1992)

Waste Management

- The EPA issued a No-Migration Determination for the test phase in November 1990.
- A transportation exercise with a simulated accident (TRANSAX-90) was successfully conducted in November 1990.
- RCRA Part A and Part B Permit Applications were submitted to the New Mexico Environmental Department in January 1991 and February 1991, respectively.
- The DOE Energy Systems Acquisition Advisory Board (ESAAB) approved the closeout of the WIPP construction phase in March 1991.
- The initial waste bin was loaded at Idaho National Engineering Laboratory in April 1991.
- The New Mexico Highway Commission designated routes for WIPP shipments within the State in August 1991.
- All commitments for waste receipt with the Advisory Committee for Nuclear Facilities Safety were closed out.
- The Nuclear Regulatory Commission's Approval of amendments to the Safety Analysis Report for Packaging allowed acceptance of 15 TRUPACT-II shipping containers in August 1991.
- The Final Safety Analysis Report Addendum for the Dry-Bin Scale Tests was issued in September 1991.
- EM Operational Readiness Review and verification of resulting prestart corrective actions were completed in September 1991.
- The Secretary of Energy's Final Decision Plan for WIPP was issued in October 1991 stating that DOE had completed all prerequisites and WIPP was ready to begin the Test Phase with TRU waste.
- Completed annual No Migration Determination Report in November 1991.
- Completed annual Performance Assessment Review and Report in December 1991.
- WIPP completed installation of Room 1, Panel 1 Room Stability Enhancement in December 1991.
- Issued Revision 4 of the WIPP Waste Acceptance Criteria in March 1992.
- Completed a summary transportation and emergency response report for Congress in April 1992.
- Completed the WIPP Project Plan and Transition Plan in July 1992.
- The WIPP Land Withdrawal Act was signed October 30, 1992.
- Successfully completed a transportation emergency exercise (TRANSAX) with States and Tribal participants on September 16, 1992.
- Successfully trained 1 400 emergency responders in FY 1992 through States Training and Educational Program.
- Los Alamos National Laboratory was selected to perform Source Term tests on August 18, 1992.
- The Court of Appeals reversed the District Court's ruling on the eligibility of WIPP for RCRA interim status in July 1992.
- The Alcove Gas Barrier final design was completed September 18, 1992.
- Completed annual No Migration Determination Report in November 1992.
- Maintained readiness of the WIPP site and transportation system to begin the Test Phase with waste.
- Continued waste characterization activities, nonradioactive testing, and performance assessment activities.

ALBUQUERQUE FIELD OFFICE PROGRESS CHART WASTE ISOLATION PILOT PLANT

Long-Term Objectives

Start full TRU waste disposal by FY 2000

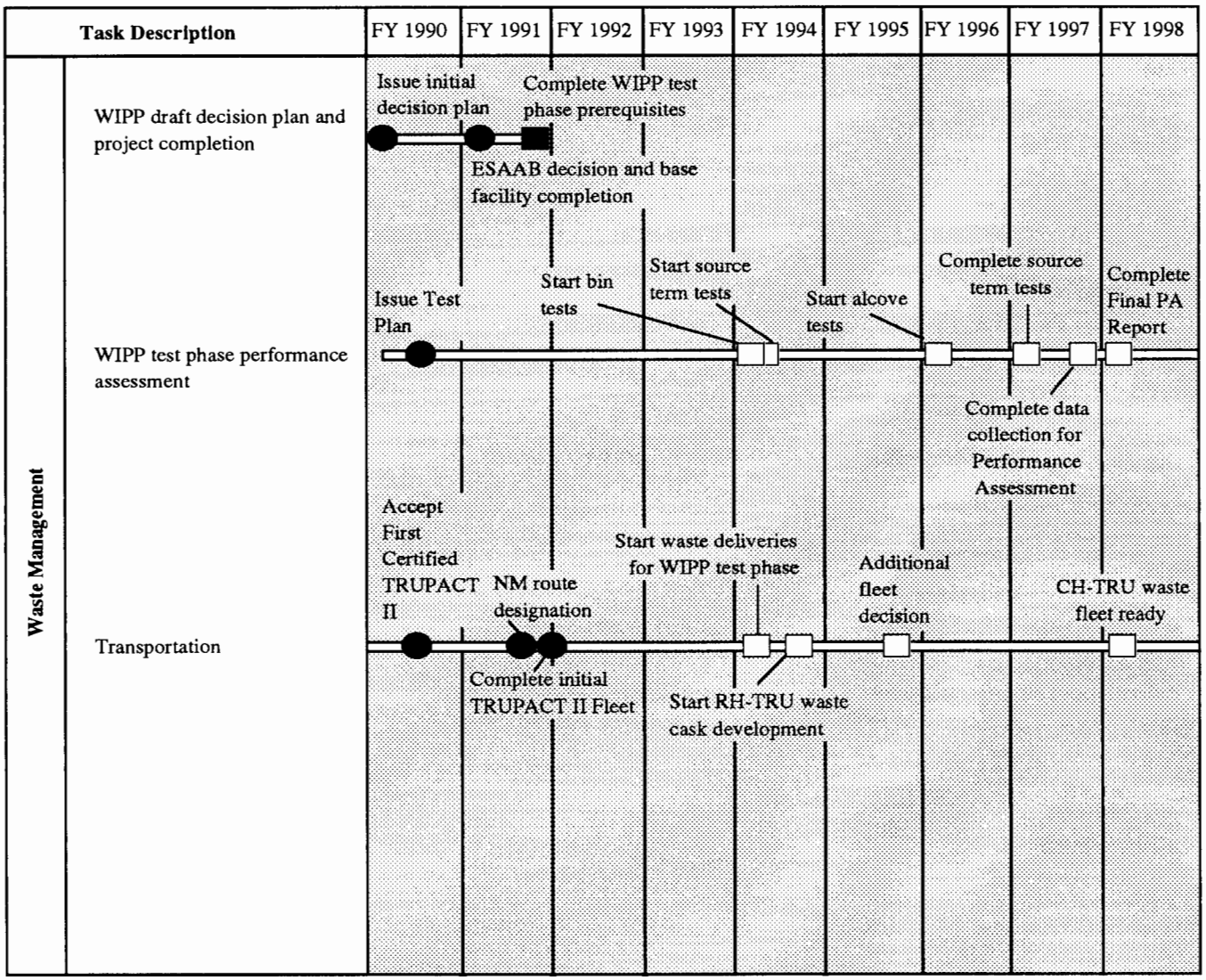
Complete TRU waste disposal by FY 2020.

Five-Year Objectives

Start bin test in FY 1993.

Start source term tests in FY 1993.

Complete data collection for performance assessments in FY 1997.



Milestone Types	Milestone Status
○ Unchanged from FY 1993-1997 FYP	○◇□ Planned
◇ New since FY 1993-1997 FYP	●◆■ Complete
□ Changed from FY 1993-1997 FYP	50 percent complete
	Information flow

Notes and Acronyms

CH-Contact Handled
ESAAB-Energy Systems Acquisition Advisory Board
FYP-Five-Year Plan
NM-New Mexico
PA-Performance Assessment
RH-Remote Handled
TRU-Transuranic
TRUPACT II-Transuranic Package Transporters

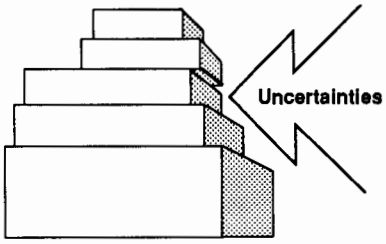
MAJOR MILESTONES

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
• Obtain WIPP land withdrawal legislation and favorable court decision.	New	1Q FY 1993[1]	Congress CA #91-2527, 40 CFR 191-B, RCRA
• Receive first waste and begin test phase.	4Q FY 1991	1Q FY 1994[1]	40 CFR 191-B, RCRA
• Start bin tests.	4Q FY 1991	1Q FY 1994[1]	40 CFR 191-B, RCRA
• Start source term tests.	3Q FY 1992	4Q FY 1994[1]	40 CFR 191-B, RCRA
• Start alcove tests.	4Q FY 1993	1Q FY 1996[1]	40 CFR 191-B, RCRA
• Complete source term tests.	1Q FY 1995	2Q FY 1997[1]	40 CFR 191-B, RCRA
• Complete data collection for Performance Assessments.	2Q FY 1996	4Q FY 1997[1]	40 CFR 191-B, RCRA
• Complete Final Performance Assessment Reports.	1Q FY 1997	1Q FY 1998[1]	40 CFR 191-B, RCRA
• Make decision on permanent disposal in WIPP.	1Q FY 1998	3Q FY 1999[1]	40 CFR 191-B RCRA

[1]Revised dates based on passage of the WIPP Land Withdrawal Act (P.L. 102-579) on October 30, 1992.

CA - Consent Agreement
CFR - *Code of Federal Regulations*

FIVE-YEAR PLAN ESTIMATES



There are a number of potential activities at the Waste Isolation Pilot Plant (WIPP) that may affect program requirements. The FY 1993 and FY 1994 budget requests did not include funds to implement the Waste Isolation Pilot Plant (WIPP) Land Withdrawal Act (P.L. 102-579). DOE could not predict the requirements of this legislation. To accomplish the Act's requirements, preliminary estimates indicate that additional resources are needed. Without these funds, implementation of the statutory requirements will be impacted. Such delays may lead to termination of the WIPP program and associated impacts. If further analysis of these uncertainties and potential additional work results in additional funding needs based on lega requirements, DOE will, through mechanisms such as reallocating budgetary resources, requesting funds through the normal appropriation process, supplemental requests or internal reprogramming, pursue funding for these activities, or where appropriate, based on technical reasons, enter into the formal conflict resolution process with regulatory bodies.

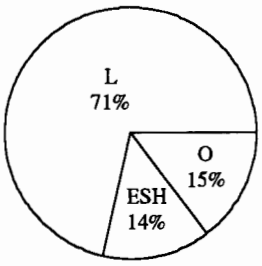
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Corrective Activities/Waste Management	140,963	185,000	209,070	225,840	247,659	271,659	277,489
Total	140,963	185,000	209,070	225,840	247,659	271,659	277,489

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites.

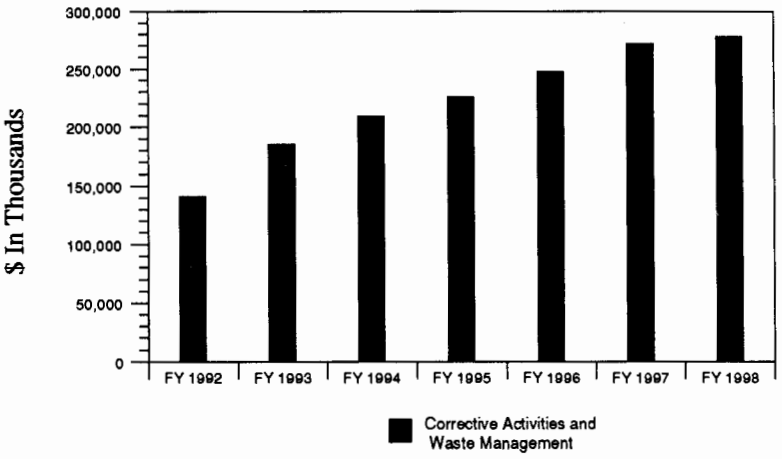
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



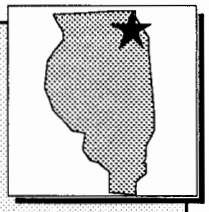
L- Legally Driven Requirements
ESH- Environment, Safety, and Health Requirements
O- Other Desirable Activities

Estimates by Year



For further information regarding Waste Isolation Pilot Plant, call (505) 845-5699.

CHICAGO FIELD OFFICE
INSTALLATION SUMMARY
ARGONNE NATIONAL LABORATORY–EAST



DESCRIPTION

Argonne National Laboratory–East (ANL-E) occupies a 1700-acre tract located approximately 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.

STRATEGIC OUTLOOK

The ANL-E primary mission is basic and applied research. ANL-E is committed to conducting its research activities in a manner that complies fully with applicable Federal and State regulations governing worker health and safety and protection of the environment. Specific environmental restoration activities that will be conducted at ANL-E over the next several years include multiple remedial action projects and several decontamination and decommissioning (D&D) projects. Waste management work at ANL-E will include transportation, storage, and disposal of hazardous and radioactive wastes. At this time, transition planning activities to ensure an orderly transition of surplus contaminated facilities to EM are projected to begin in FY 1994 at ANL-E. Several facilities have been identified for potential transfer to EM, but all plans are still preliminary and more information is forthcoming.

ANL-E has resolved comments on its RCRA Part B Permit Application with the Illinois EPA. Since the RCRA Permit is in place, ANL-E will be responding to forthcoming RCRA Facility Investigations and corrective actions that will be required of permitted facilities. The RCRA Permit requires ANL-E to develop cleanup objectives for on-site contaminated areas and address future land use. Currently, ANL-E is in the process of identifying specific land uses for many of the contaminated areas and establishing planned land uses before the conduct of risk assessments in the corrective action process. Major waste management goals include (1) ensuring that the public, workers, and the environment are protected from the hazards associated with waste materials and (2) continuing to enhance ANL-E waste minimization programs.

ANL-E environmental restoration activities include preparations to close and remediate the 800 Area Landfill that was formerly used to dispose of some hazardous materials and is currently operating as a sanitary landfill. The 317/319/ ENE area has been and is currently used as an interim storage area for radioactive wastes before shipment off-site to approved final disposal locations. Several facilities at the laboratory currently contain areas of low-level radioactive contamination that restrict their use. These areas will be decontaminated to allow for unrestricted reuse of the facility. As facility D&D projects are completed, the sources of potential or actual radiological releases will be significantly reduced or eliminated altogether. Following completion of D&D activities at the laboratory, all facilities will be available for renovation and reuse by ANL-E research programs.

ACCOMPLISHMENTS (FY 1991 – 3Q FY 1992)

Corrective Activities

- Repair and upgrade of the laboratory and sanitary sewer system is continuing. Construction begins Fall 1992 and is to be completed by September 1993.
- Construction of the equalization pond, completed ahead of schedule, is now operational.
- ANL-E has connected to the DuPage County Sanitary Treatment System and is now in compliance with National Pollutant Discharge Elimination System Permit for Total Dissolved Solids at Outfall 001. Future design and construction costs for a new chloride removal plant were thus avoided.

Waste Management

- Waste disposal shipments to off-site facilities were conducted safely and without incident.
- New staff members were added to waste operations. All staff members have received additional operations and safety training.
- ANL-E was the first DOE laboratory to pass the EPA Performance Demonstration Program for organic gases.

Environmental Restoration

- A training mock-up of the Experimental Boiling Water Reactor (EBWR) vessel has been fabricated with simulated reactor internals.

Technology Development

- Fifteen fixed-price contracts to conduct applied research and development (R&D) to improve DOE's environmental restoration capabilities were awarded. These contracts include development of technologies, such as new methods for monitoring tritium in groundwater, and soil washing and vitrification to remove or stabilize contaminants. Several technology demonstrations have been successfully completed, and several others are moving into the demonstration and implementaiton stages.
- A demonstration of the TRUEX process to recover transuranic (TRU) material from actual TRU waste for reuse as fuel and in R&D programs was completed.
- An Educational Outreach Program to develop and test curriculum materials on Environmental Restoration and Waste Management career opportunities for dissemination to high schools in the Chicago area was initiated.

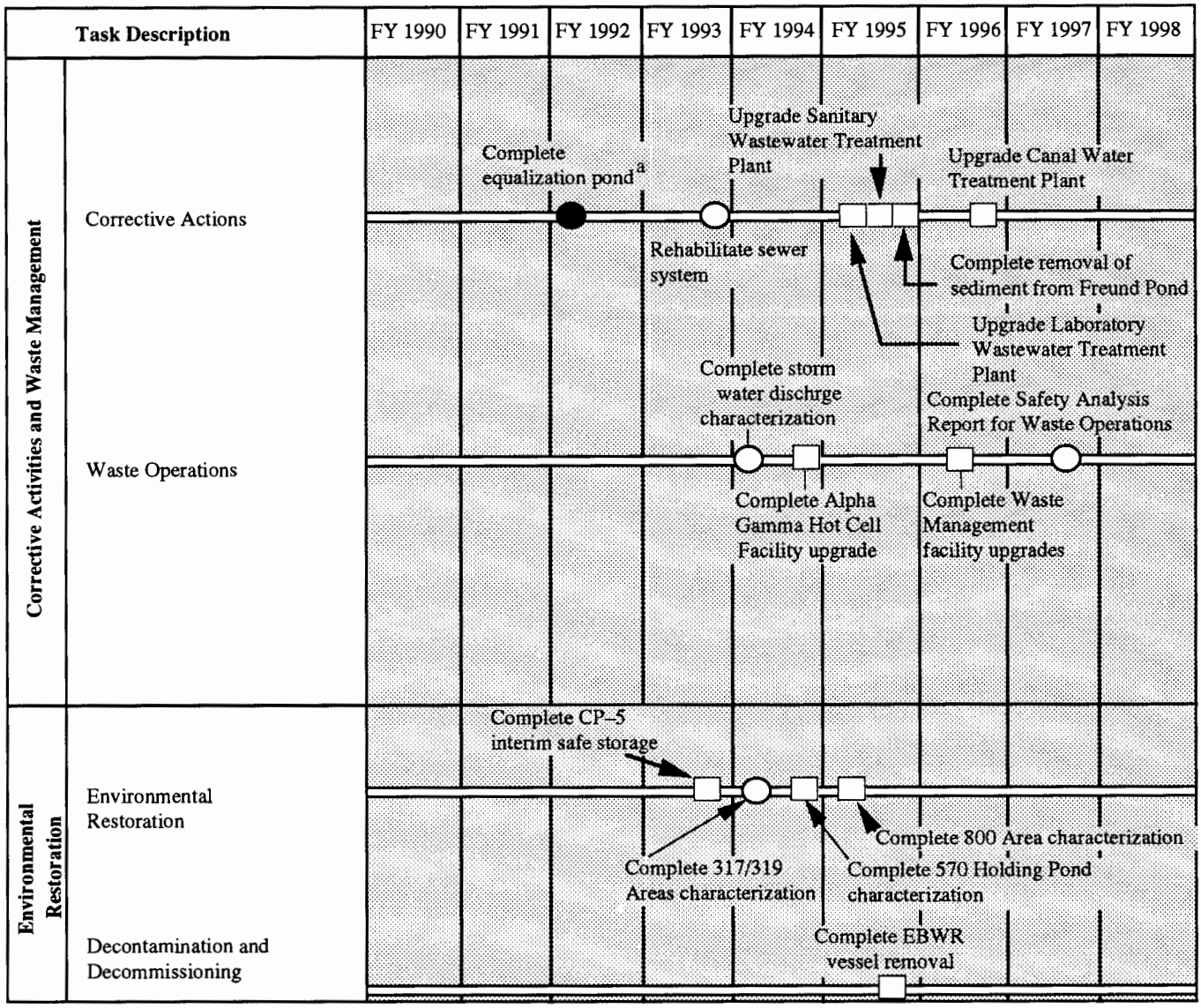
Transportation and Emergency Management

- ANL-E provides support to the Liaison and Communications Staff's program for institutional public information. This program explains DOE transportation and emergency management activities, facilitates opportunities for discussion, and solicits the public's views. It supports public interactions and information needs to explain DOE's shipping activities and to address critical public concerns. These activities identify the major issues requiring resolution and develop approachs to resolve them, facilitating effective understanding and participation of major stakeholders, including the public.

CHICAGO FIELD OFFICE
PROGRESS CHART
ARGONNE NATIONAL LABORATORY-EAST

Long-Term Objectives
Continually improve waste minimization practices.
Ship all stored wastes off-site.
Complete all scheduled D&D and ER projects.

Five-Year Objectives
Complete all Corrective Activities.
Achieve full compliance with new storm water regulations.
Complete all scheduled D&D and ER projects.



Milestone Types	Milestone Status
○ Unchanged from FY 1993-1997 FYP	○ ◇ □ Planned
◇ New since FY 1993-1997 FYP	● ◆ ■ Complete
□ Changed from FY 1993-1997 FYP	◍ ◈ ▤ 50 percent complete
	– – – → Information flow

Notes and Acronyms

[a] Equalization pond completed ahead of schedule.

D&D-Decontamination and Decommissioning
EBWR-Experimental Boiling Water Reactor
ER-Environmental Restoration
FYP-Five-Year Plan

MAJOR MILESTONES

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
Corrective Activities			
• Complete cooling tower blowdown diversion.	FY 1991	TBD[1]	
• Rehabilitate sewer systems.	FY 1993	4Q FY 1993	CWA/NPDES Permit
• Complete equalization pond.	FY 1993	2Q FY 1992[2]	CWA/NPDES Permit
• Upgrade sanitary wastewater treatment plant.	FY 1993	2Q FY 1995[3]	CWA/NPDES Permit
• Upgrade laboratory wastewater treatment plant.	FY 1993	1Q FY 1995[3]	CWA/NPDES Permit
• Complete removal of sediment from Freund Pond.	FY 1994	4Q FY 1995[4]	CWA/NPDES Permit
• Complete landfill leachate collection system.	FY 1994	Eliminated[5]	
• Upgrade canal water treatment plant.	FY 1994	4Q FY 1996[6]	CWA# 35 Ill. Adm Code 304.141
Waste Management			
• Complete Alpha Gamma Hot Cell Facility upgrade.	FY 1993	4Q FY 1994[7]	DOE Order 5820.2A
• Complete storm water discharge characterization.	FY 1994	1Q FY 1994	CWA/NPDES Permit
• Complete Waste Management Facility upgrades.	FY 1995	2Q FY 1996[6]	RCRA 40 CFR 264
• Complete Safety Analysis Report (SAR) for Waste Operations.	FY 1997	4Q FY 1997	DOE Order 5480.SAR
Environmental Restoration			
• Complete Experimental Boiling Water Reactor (EBWR) vessel removal.	FY 1991	3Q FY 1995[8]	DOE Order 5820.2A
• Complete characterization of 800 Area.	FY 1992	2Q FY 1995[9]	35 ILL Adm Code 807
• Complete characterization of 570 Holding Pond.	FY 1994	4Q FY 1994[10]	35 ILL Adm Code 304
• Complete CP-5 Interim Safe Storage.	FY 1994	4Q FY 1993	DOE Order 5820.2A

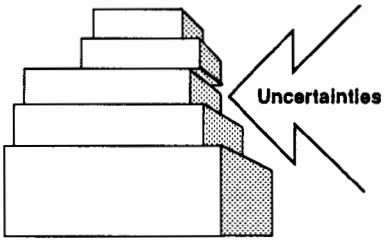
MAJOR MILESTONES (Continued)

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
• Complete characterization of 317/319 Areas.	FY 1994	2Q FY 1994	RCRA 3004(u)
Transportation			
• Implement Transportation Awareness Program.	New	FY 1994	DOE Management Initiative
• Distribute file and materials through film.	New	Ongoing	DOE Management Initiative
• Produce the TRANSAX-92 Video.	New	FY 1993	DOE Management Initiative

[1]Delayed pending finalization of work scope.
[2]Project completed ahead of schedule. The Boilerhouse Water Treatment Plant subproject is being terminated in favor of a more cost-effective solution.
[3]Upgrade delayed because of changes in project scope.
[4]Project on hold pending decision on sediment disposal options.
[5]Milestone eliminated. Collection system canceled as a result of closure of landfill.
[6]Project delayed because of change in scope and reprogramming to a line-item project.
[7]Project delayed because of prioritization.
[8]Removal delayed because of additions to project scope.
[9]Project reprioritized and delayed.
[10]Previous Plan milestone "Remediate 570 Holding Pond" changed to "characterization."

CFR - *Code of Federal Regulations*
CWA - Clean Water Act
NPDES - National Pollutant Discharge Elimination System
Ill. Admin Code - Illinois Administrative Code
TBD - to be determined

FIVE-YEAR PLAN ESTIMATES



There are a number of potential activities at Argonne National Laboratory –East (ANL–E) that may affect program requirements. These potential activities have not been included in the estimates below due to various uncertainties regarding scope of work, the phasing of regulatory reviews and approval schedules, availability of technology, lack of independent cost reviews and other factors. At ANL–E, uncertainties are in part related to decontamination and decommissioning of the Experimental Boiling Water Reactor. If further analysis of these uncertainties and potential additional work results in additional funding needs based on legal requirements, DOE will, through mechanisms such as reallocating budgetary resources, requesting funds through the normal appropriation process, supplemental requests or internal reprogramming, pursue funding for these activities, or where appropriate, based on technical reasons, enter into the formal conflict resolution process with regulatory bodies.

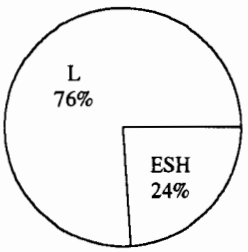
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Corrective Activities/Waste Management	20,641	19,894	19,217	17,939	17,989	18,044	18,057
Environmental Restoration	6,506	18,370	6,828	11,087	16,223	16,304	15,677
Total	27,147	38,264	26,045	29,026	34,212	34,348	33,734

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites.

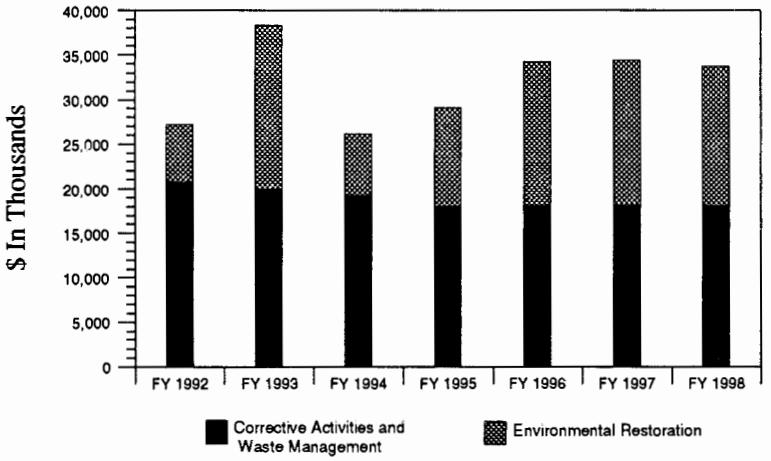
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



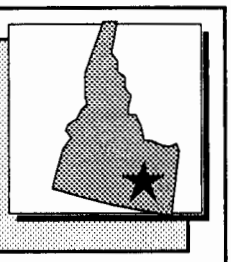
L- Legally Driven Requirements
ESH- Environment, Safety, and Health Requirements

Estimates by Year



For further information regarding Argonne National Laboratory-East, call (708) 252-2013.

CHICAGO FIELD OFFICE
INSTALLATION SUMMARY
ARGONNE NATIONAL LABORATORY–WEST



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 of ANL-W 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, and the Zero Power Physics Reactor.

STRATEGIC OUTLOOK

The overall strategic objectives of ANL-W's EM Five-Year Plan activities are the assessment and remediation of solid waste management units to a condition acceptable to EPA Region X and the State of Idaho and to upgrade and conduct corrective activities and waste management operations in a manner that meets the requirements and intent of current statutes, regulations, and DOE Orders while minimizing costs and environmental, safety, and health impacts.

The waste management activities provide for a complete program in which all radioactive, industrial and sanitary waste streams are characterized, treated, stored, or disposed of in accordance with all applicable Federal, State, local, and DOE requirements. ANL-W sites, identified as Waste Area Grouping 9 (WAG 9), are being investigated in accordance with the Federal Facility Agreement/Consent Order (FFA/CO) action plan and schedules and include wastewater handling/disposal systems such as ditches, ponds, pits, and drains. Included in WAG 9 are four Operable Units (OUs) that will undergo assessment and remediation (if necessary) in accordance with the FFA/CO. Following assessments of the four OUs, a draft Record of Decision (ROD) will be submitted to EPA by June 1999. Following EPA signature on the ROD, remedial design/remedial assessment will commence.

The objective of the ANL-W Environmental Restoration Program is to return land to its original condition for probable grazing use. Based on current land use patterns and industrial development, there is a low probability that ANL-W would be used for anything but grazing.

Environmental restoration activities include assessments and remediation of inactive waste sites, as required by the FFA/CO among DOE, EPA, and the State of Idaho. In conjunction with inactive waste site assessments and remediation are the ongoing characterization and monitoring of site conditions to meet the requirements and intent of DOE Orders and INEL Environmental Oversight/Agreement-in-Principle between DOE and the State of Idaho. These strategies provide for protection of all groundwater and other media contiguous to the ANL-W site. Protection is necessary because groundwater is used for potable water at ANL-W, and the land within ANL-W's administrative boundaries is used for grazing wildlife.

ACCOMPLISHMENTS (FY 1991 – 3Q FY 1992)

Corrective Activities

- Installed 150 replacement waste storage liners in FY 1991.
- Relocated 181 liners of radioactive and mixed waste as of January 15, 1992.

Waste Management

- ANL-W passed the EPA Performance Demonstration Program for nitrogen oxides and inorganic gases.
- Completed visual examination and loading of four bins for emplacement in the Waste Isolation Pilot Plant research and development phase.
- Radioactive, hazardous, mixed, and sanitary wastes were safely stored and disposed of without incident.

Environmental Restoration

- FFA/CO issued in December 1991.
- Completed EBR II Leach Pit characterization study in FY 1991.
- Successfully installed monitoring well south of the EBR II Leach Pit.

CHICAGO FIELD OFFICE
PROGRESS CHART
ARGONNE NATIONAL LABORATORY-WEST

Long-Term Objectives

Complete all operations in accordance with the Federal Facility Agreement/ Consent Order.

Complete all OU assessments, obtain Records of Decision, and commence Remedial Designs/ Remedial Actions.

Five-Year Objectives

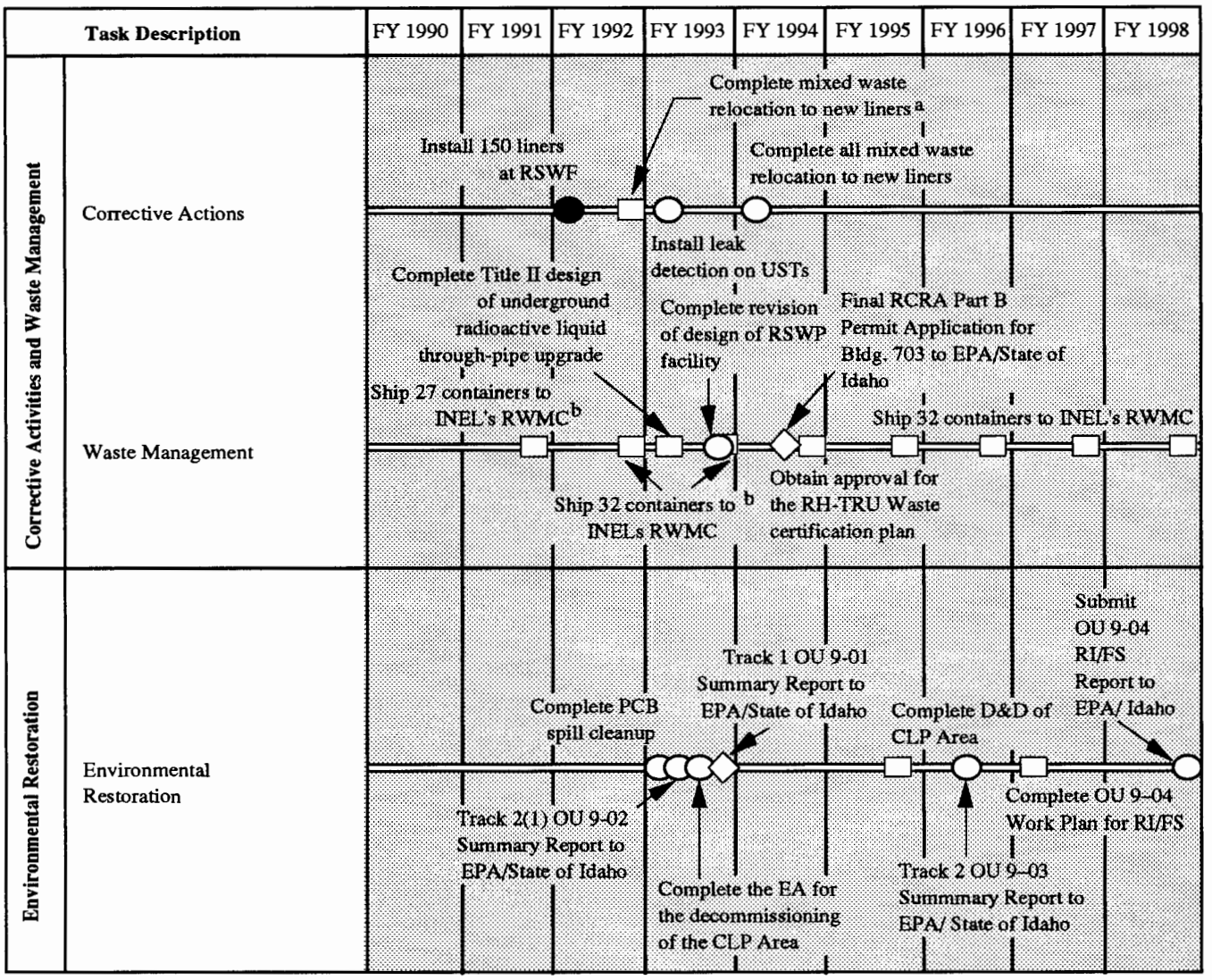
Complete all corrective activities.

Relocate all mixed waste to new liners.

Continue shipment of low-level wastes to RWMC.

Operate all waste management facilities under RCRA Part B permit.

Complete track process on three OUs.



Milestone Types	Milestone Status
○ Unchanged from FY 1993–1997 FYP	○ ◇ □ Planned
◇ New since FY 1993–1997 FYP	● ◆ ■ Complete
□ Changed from FY 1993–1997 FYP	50 percent complete
	Information flow

Notes and Acronyms

[a] Accelerated because of Notice of Deficiency.

[b] No DOT-approved casks available to ship waste.

CLP- Central Liquid Processing
D&D - decontamination and decommissioning
DOT - Department of Transportation
EA - Environmental Assessment
FYP - Five-Year Plan
INEL- Idaho National Engineering Lab
OU- Operable Unit
PCB- polychlorinated biphenyls
RH-TRU- Remote-handled Transuranic Waste
RI/FS - Remedial Investigation/ Feasibility Study
RSWF- Radioactive Scrap and Waste Facility
RSWP- Radioactive Sodium Waste Processing
RWMC- Radioactive Waste Management Complex
USTs- underground storage tanks

MAJOR MILESTONES

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
Corrective Activities			
• Install leak detection on underground storage tanks.	FY 1993	1Q FY 1993	RCRA 40 CFR 280
• Complete mixed waste relocation to new liners (singly contained mixed waste).	1Q FY 1993	4Q FY 1992[1]	RCRA 40 CFR 264, 265
• Complete all mixed waste relocation to new liners.	1Q FY 1994	1Q FY 1994	RCRA 40 CFR 264, 265
Waste Management			
• Obtain approval for the remote-handled Transuranic Waste Certification Plan.	FY 1993	4Q FY 1993	DOE Order 5800.2A
• Complete revision of old design for Radioactive Sodium Waste Process Facility.	FY 1994	4Q FY 1994	RCRA 40 CFR 268
• Ship 32 containers of waste to the INEL Radioactive Waste Management Complex (27 in FY 1991, 32 each year during FY 1992–1998).	FY 1991–1997	FY 1992–1998[2]	DOE Order 5820.2A
• Complete Title II design of underground Radioactive Liquid through-pipe upgrade.	New	1Q FY 1993	DOE Order 5820.2A
• Submit Final RCRA Part B Permit Application for Building 703 to EPA/State of Idaho.	New	3Q FY 1994	RCRA 40 CFR 265
Environmental Restoration			
• Complete cleanup of polychlorinated biphenyl spill.	FY 1993	1Q FY 1993	TSCA 40 CFR 761
• Complete the environmental assessment for the decommissioning of the Central Liquid Processing (CLP) Area.	FY 1993	3Q FY 1993	NEPA/DOE Order 5820.2A
• Complete decontamination and decommissioning of CLP Area.	FY 1993	4Q FY 1995[3]	DOE Order 5820.2A

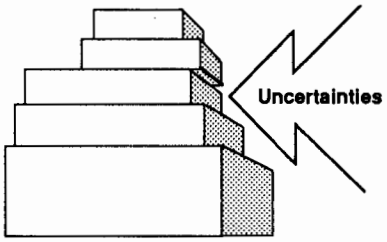
MAJOR MILESTONES (Continued)

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
• Track 2 (1) OU 9-02 (EBR II Leach Pit) Summary Report to EPA/State of Idaho.	3Q FY 1993	3Q FY 1993	FFA/CO WAG 9
• Track 1 OU 9-01 Summary (Wastewater/Disposal Systems) Report to EPA/State of Idaho.	4Q FY 1993	4Q FY 1993	FFA/CO WAG 9
• Track 2 OU 9-03 (Burn Pits and Oil Spill) Summary Report to EPA/State of Idaho.	3Q FY 1996	3Q FY 1996	FFA/CO WAG 9
• Complete OU 9-04 (Waste Ponds and Ditches) Work Plan for RI/FS.	2Q FY 1997	1Q FY 1997[4]	FFA/CO WAG 9
• Submit OU 9-04 RI/FS Report to EPA/ State of Idaho.	4Q FY 1998	4Q FY 1998	FFA/CO WAG 9
• Submit draft ROD for OU 9-04 to EPA/ State of Idaho.	3Q FY 1999	3Q FY 1999	FFA/CO WAG 9

[1]Represents new milestone subdivided from previous Five-Year Plan milestone, "Complete waste container relocation to new liners." This portion has been accelerated because of Notice of Deficiency and requirement set by State of Idaho and agreed to by ANL-W.
[2]Project on hold. No Department of Transportation approved cask available for shipment.
[3]Project schedule and scope modified by FFA/CO priorities.
[4]Schedule accelerated to comply with FFA/CO WAG 9.

CFR - *Code of Federal Regulations*
FFA/CO - Federal Facilities Agreement/Consent Order
NEPA - National Environmental Policy Act
TSCA - Toxic Substances Control Act
WAG - Work Area Group
PCB - polychlorinated biphenyl
OU - Operable Unit
CLP - Central Liquid Processing

FIVE-YEAR PLAN ESTIMATES



There are a number of potential activities at Argonne National Laboratory–West (ANL-W) that may affect program requirements. These potential activities have not been included in the estimates due to various uncertainties regarding scope of work, the phasing of regulatory reviews and approval schedules, availability of technology, lack of independent cost reviews and other factors. At ANL-W, uncertainties are in part related to additional environmental assessment for the decommissioning of the Central Liquid Processing Area and program management support for remedial action, treatability studies, site assessment and decontamination and decommissioning activities. If further analysis of these uncertainties and potential additional work results in additional funding needs based on legal requirements, DOE will, through mechanisms such as reallocating budgetary resources, requesting funds through the normal appropriation process, supplemental requests or internal reprogramming, pursue funding for these activities, or where appropriate, based on technical reasons, enter into the formal conflict resolution process with regulatory bodies.

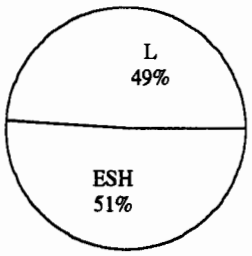
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Corrective Activities/Waste Management	2,897	2,797	3,244	2,571	2,604	2,639	2,648
Environmental Restoration	887	985	2,754	1,554	1,232	2,431	1,592
Total	3,784	3,782	5,998	4,125	3,836	5,070	4,240

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites.

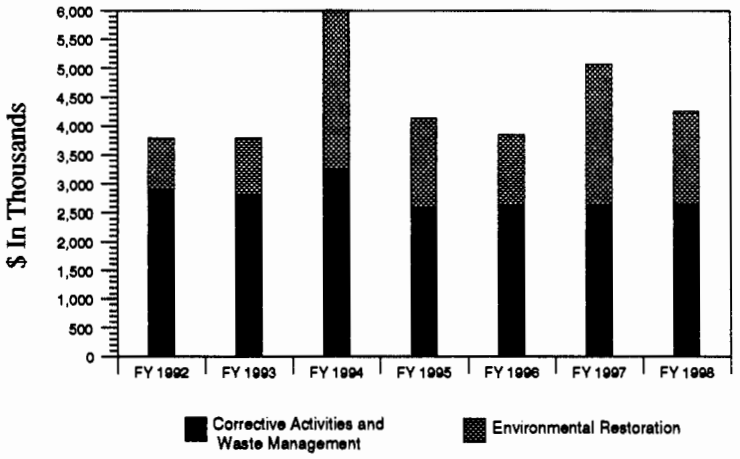
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



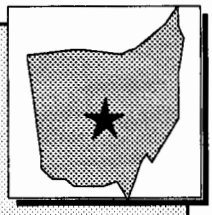
L- Legally Driven Requirements
ESH- Environment, Safety, and Health Requirements

Estimates by Year



For further information regarding Argonne National Laboratory–West, call (708) 252-2013.

CHICAGO FIELD OFFICE
INSTALLATION SUMMARY
BATTELLE COLUMBUS LABORATORIES



DESCRIPTION

Battelle Columbus Laboratories comprise two major research complexes, one in the city of Columbus and one in rural Madison County, Ohio. The King Avenue (Columbus) site houses corporate offices and general research laboratories. The West Jefferson (Madison County) site comprises a number of facilities formerly dedicated to nuclear research. Since mid-1943, the Battelle Memorial Institute (Battelle) has continuously performed contract research and development work at its Columbus Laboratories for DOE and its predecessor agencies.

STRATEGIC OUTLOOK

The Battelle Columbus Laboratories are privately owned. DOE no longer needs the facilities and is obligated contractually to remove the contamination so that laboratories can be used by Battelle without radiological restriction. Fifteen buildings, or portions thereof, and associated soil areas, are radioactively contaminated as a result of work under government contract and are to be decontaminated and released to Battelle without radiological restrictions. Battelle also holds an active license from the Nuclear Regulatory Commission, which sets specific requirements for timely decontamination of these laboratory facilities. The environmental restoration project approach is to

- decontaminate laboratory equipment, interior building surfaces, and soil areas using available technology in the most cost-effective manner possible;
- perform decontamination to levels defined in DOE Order 5400.5 and Nuclear Regulatory Commission Guide 1.86;
- provide for ongoing radiological monitoring and control of contaminated areas until such time as active decontamination commences;
- segregate and minimize radioactive low-level and transuranic wastes resulting from decontamination activities to reduce waste shipment and disposal costs;
- dispose of all radioactive and mixed wastes at an off-site DOE facility;
- receive an independent verification survey for each building decontamination and obtain Nuclear Regulatory Commission and DOE management acceptance of certification docket for completed decontamination in each building, and release facilities to Battelle; and
- provide restoration funds to Battelle based on an analysis of "fair market" replacement value for materials removed and fair "wear and tear" of the facilities.

ACCOMPLISHMENTS (FY 1991 – 3Q FY 1992)

Environmental Restoration

- Completed the decontamination of Building 9 on the King Avenue campus ahead of schedule at a significant cost reduction.
- Completed three additional low-level waste shipments to Hanford, Washington. Three additional shipments resulted from decontamination activities and mixed sludge removed from 13 sumps at the King Avenue campus for a total of six low-level waste shipments to Hanford, Washington.
- Updated the Environmental Protection Implementation Plan and submitted it to DOE in 1Q FY 1992.
- Developed an overall multiyear baseline plan, which included a detailed critical path methodology, network-based, resource-levelled schedule that spans the entire project.
- The Battelle Columbus Laboratories Decommissioning Project was favorably reviewed by the Office of Management and Budget (OMB) and the Army Corps of Engineers (COE). The review examined regulatory and Federal compliance agreements, project scope, and the cost estimates in the FY 1993 budget proposal. The OMB report gave the project a Category 1 priority rating. In addition, the final report by the COE commended favorably the level of planning and documentation of the project.
- Updated and submitted Project Plan (Rev. 1) and Project Management Plan (Rev. 2).
- Submitted Predecisional Draft Roadmap Document for the Battelle Columbus Laboratories Decommissioning Project to DOE Headquarters in 2Q FY 1992.

MAJOR MILESTONES

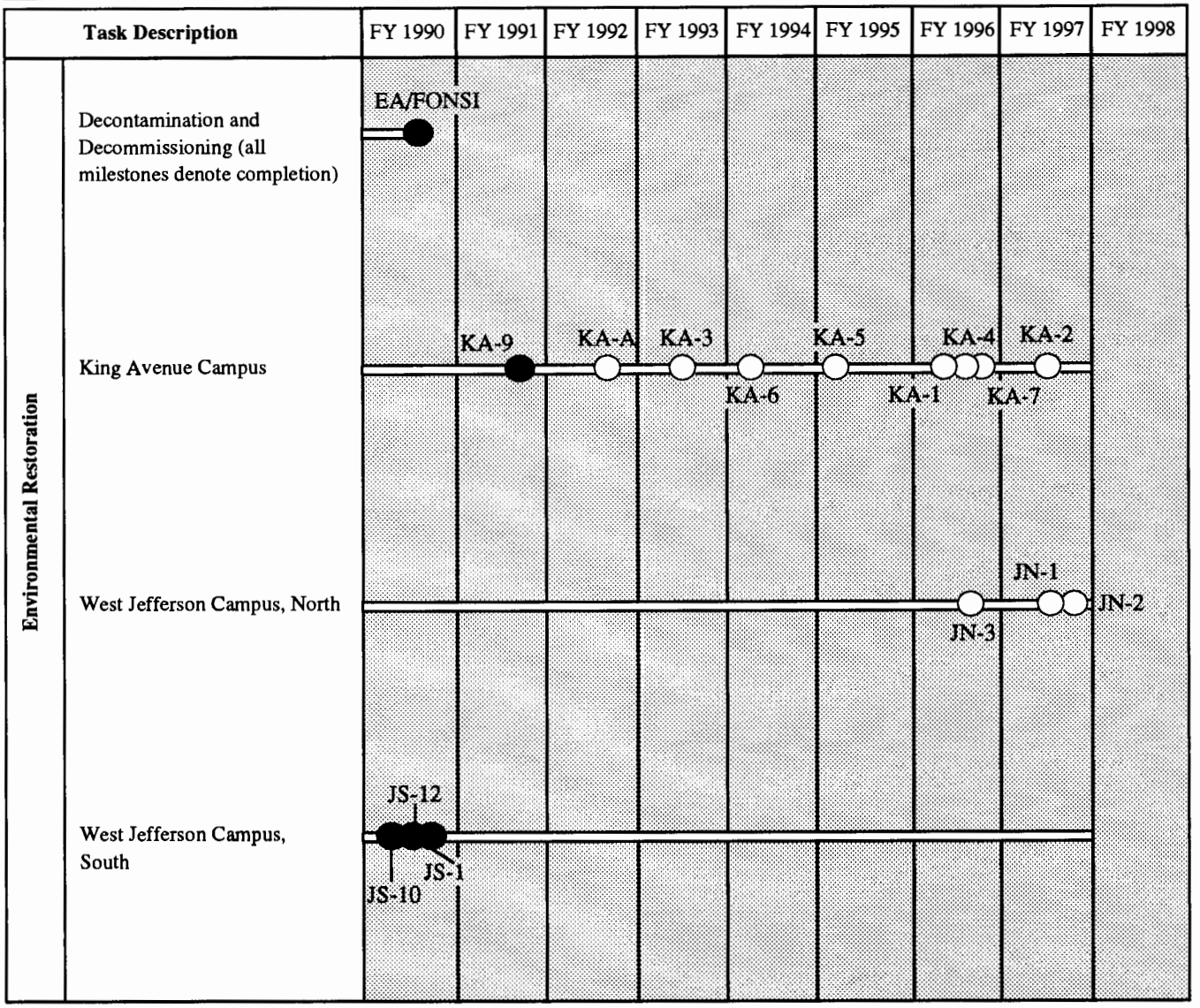
	Schedule FY 1993–1997 Five-Year Plan[1]	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
Environmental Restoration			
• Complete D&D/Release Building A.	FY 1992	3Q FY 1992	DOE Order 5820.2A
• Complete D&D/Release Building 3.	FY 1993	2Q FY 1993	DOE Order 5820.2A
• Complete D&D/Release Building 6.	FY 1994	1Q FY 1994	DOE Order 5820.2A
• Complete D&D/Release Building 5.	FY 1996	1Q FY 1995	DOE Order 5820.2A
• Complete D&D/Release Building 1.	FY 1997	2Q FY 1996	DOE Order 5820.2A
• Complete D&D/Release Building 4.	FY 1998	3Q FY 1996	DOE Order 5820.2A
• Complete D&D/Release Building JN-3.	FY 1999	3Q FY 1996	DOE Order 5820.2A
• Complete D&D/Release Building 7.	FY 1998	4Q FY 1996	DOE Order 5820.2A
• Complete D&D/Release Building 2.	FY 1998	3Q FY 1997	DOE Order 5820.2A
• Complete D&D/Release Building JN-1.	FY 2000	3Q FY 1997	DOE Order 5820.2A
• Complete Soil Remediation (WJ).	New	4Q FY 1997	DOE Order 5820.2A
• Complete D&D/Release Building JN-2.	FY 2000	4Q FY 1997	DOE Order 5820.2A

[1] Includes data from Site-Specific Plan.

CHICAGO FIELD OFFICE
PROGRESS CHART
BATTELLE COLUMBUS LABORATORIES

Long-Term Objectives
Complete D&D of BCL and release facilities to use without radiological restrictions.

Five-Year Objectives
Complete D&D of all King Avenue and West Jefferson site buildings.

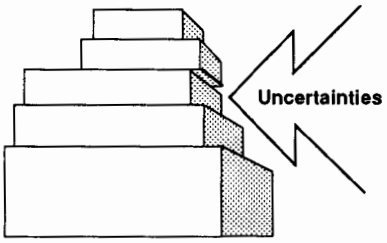


Milestone Types	Milestone Status
○ Unchanged from FY 1993–1997 FYP	○ ◇ □ Planned
◇ New since FY 1993–1997 FYP	● ◆ ■ Complete
□ Changed from FY 1993–1997 FYP	50 percent complete
	– – – → Information flow

Notes and Acronyms

BCL-Battelle Columbus Laboratories
D&D-decontamination and decommissioning
EA-Environmental Assessment
FONSI-Findings of No Significant Impact
FYP- Five-Year Plan
KA-King Avenue
JN-West Jefferson Campus, North
JS-West Jefferson Campus, South

FIVE-YEAR PLAN ESTIMATES



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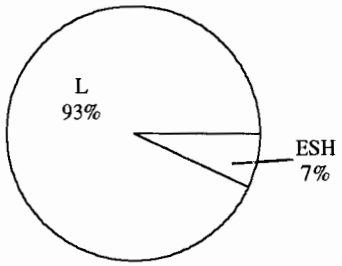
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Environmental Restoration	16,226	19,717	19,763	15,450	23,506	18,506	10,982
Total	16,226	19,717	19,763	15,450	23,506	18,506	10,982

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites.

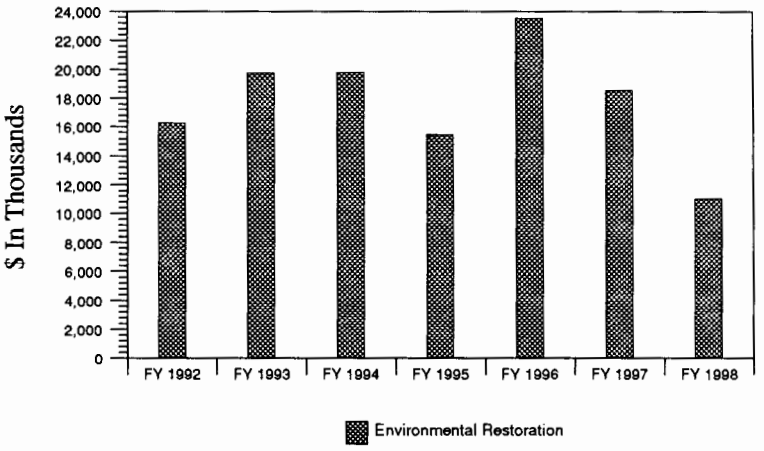
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



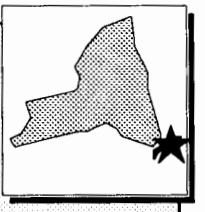
L- Legally Driven Requirements
ESH- Environment, Safety, and Health Requirements

Estimates by Year



For further information regarding Battelle Columbus Laboratories, call (708) 252-2013.

CHICAGO FIELD OFFICE
INSTALLATION SUMMARY
BROOKHAVEN NATIONAL LABORATORY



DESCRIPTION

Brookhaven National Laboratory (BNL) is a multipurpose research and development laboratory located in central Suffolk County on Long Island about 60 miles east of New York City. The site occupies about 8.3 square miles, which is mostly wooded, except for a developed area of about 2.6 square miles. To fulfill its role as a multiprogram laboratory, BNL directs scientific and technical efforts, including low- and high-energy physics, 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. BNL is located over an EPA-designated, sole-source drinking water aquifer.

STRATEGIC OUTLOOK

The overall strategic environmental goals of BNL include a systematic investigation and remediation of contamination on-site in accordance with an Interagency Agreement (IAG); management of hazardous materials in compliance with applicable Federal, State, and local regulations; and minimization of waste produced by BNL operations. These efforts will be an important factor in maintaining BNL as a vital research and development facility well into the future. Environmental restoration and waste management activities are key to the successful continuation of BNL's primary mission.

In December 1989, EPA included BNL on the National Priorities List of CERCLA sites, and an IAG among DOE, EPA, and New York State Department of Environmental Conservation was signed February 28, 1992. A 45-day public comment period ended May 4, 1992, and the IAG was finalized May 27, 1992.

Waste operations on-site will continue to manage both hazardous and radioactive waste generated by normal site operations, and support current and planned restoration activities. New facilities are planned for waste operations and should be available by the end of the current five-year planning period.

The Laboratory is upgrading its sewage treatment system as part of the long-range effort to improve the infrastructure. Activities have been initiated to address the new EPA Storm Waste Discharge Regulations, which will probably require further changes to BNL facilities.

BNL defined its overall response strategy and approach to categorizing, characterizing, configuring and prioritizing the 24 Areas of Concern currently identified in the Response Strategy Document. The 24 Areas of Concern have been grouped into seven operable units where remedial investigations will be conducted. Several activities started before the IAG to characterize the overall hydrogeologic regime of the site and provide remediation of a known plume within the aquifer; these activities are now included in the IAG. Priorities for response actions were developed using criteria that included an assessment of health and safety, regulatory and institutional constraints; preliminary risk assessment; public concern; and funding.

At this time, transition planning activities to ensure an orderly transition of surplus contaminated facilities to EM are projected to begin in FY 1994 at BNL. Several facilities have been identified for potential transfer to EM, but all plans are preliminary and more information is forthcoming.

ACCOMPLISHMENTS (FY 1991 – 3Q FY 1992)

Corrective Activities

- Removed 13 of 21 underground storage tanks.
- Upgrades completed on remaining eight tanks.

Waste Management

- Training and Quality Assurance functions added as integral hazardous waste management programs.
- Initiated two-year campaign to ship and dispose of 9760 cubic feet of stored radioactive waste.
- Completed Employee RCRA Waste Characterization and Certification Training Program.
- Revised and submitted scope of new hazardous waste facilities construction project.
- Completed construction of Detector Station to divert flow from sewage treatment plant to holding ponds.

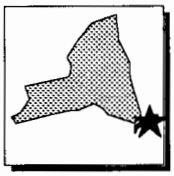
Environmental Restoration

- Issued Site Baseline Report identifying all areas of concern as well as response strategy and schedules documents describing site remedial schedule and priorities.
- Implemented Site Hydrogeology Program improvements.
- Developed Soil Sampling and Analysis Plan for D Tanks and Cesspools.
- Sampled and analyzed soil at D Tanks.
- Conducted trial run for Spray Aeration Removal Project, including the installation of eight new wells to evaluate capability of Spray Aeration System to remove volatile organic compounds from groundwater.
- Completed Remedial Investigation/Feasibility Study work plans for OU 4.

Technology Development

- Successfully demonstrated two innovative groundwater sampling systems.
- Completed investigations of the effects of elevated thermal conditions and radiation dose on waste form parameters. At 70 degrees Celsius, polyethylene provides a twenty-fold decrease in leachability while encapsulating approximately four times more sodium nitrate waste than cement grout.
- Established the long-term durability of polyethylene waste forms, process scale-up, and economic viability.

CHICAGO FIELD OFFICE
PROGRESS CHART
BROOKHAVEN NATIONAL LABORATORY



	Task Description	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994
Corrective Activities and Waste Management	Corrective Actions	Complete drum storage; Complete cesspool reconnection	SAP cesspools	Start Phase III UST upgrades	Complete UST sludge removal	Phase III UST complete; Complete UST removal
	Waste Operations WCF	Operations	OP/Maint. SOP Manuals	Spray System	SAR on WCF	
	Waste Operations HWM Facility	Operations	Phase I ship accumulated waste	Add fire protect. HWM storage	SAR new WM facilities; Training program	
	Waste Facilities Construction	CDRs STP WM floor drain	Flow division	WCF Construction	NEPA floor drains	Complete HWM I Construction
Environmental Restoration	Restoration, Operable Units	RI SOW OU IV	RI/FS OU IV Work Plan	Complete Sitewide geohydrologic assessment; Trial run aquifer restoration	RI/FS WP OU I	Initiate RI OU 1; RI Report OU 4; FS/PRAP OU 4; ROD OU 4
	Restoration, D Tanks Removal		Draft EE/CA-D tanks	Final EE/CA-D tanks	AM-D tanks	Start D tank removal
	Decontamination and Decommissioning					

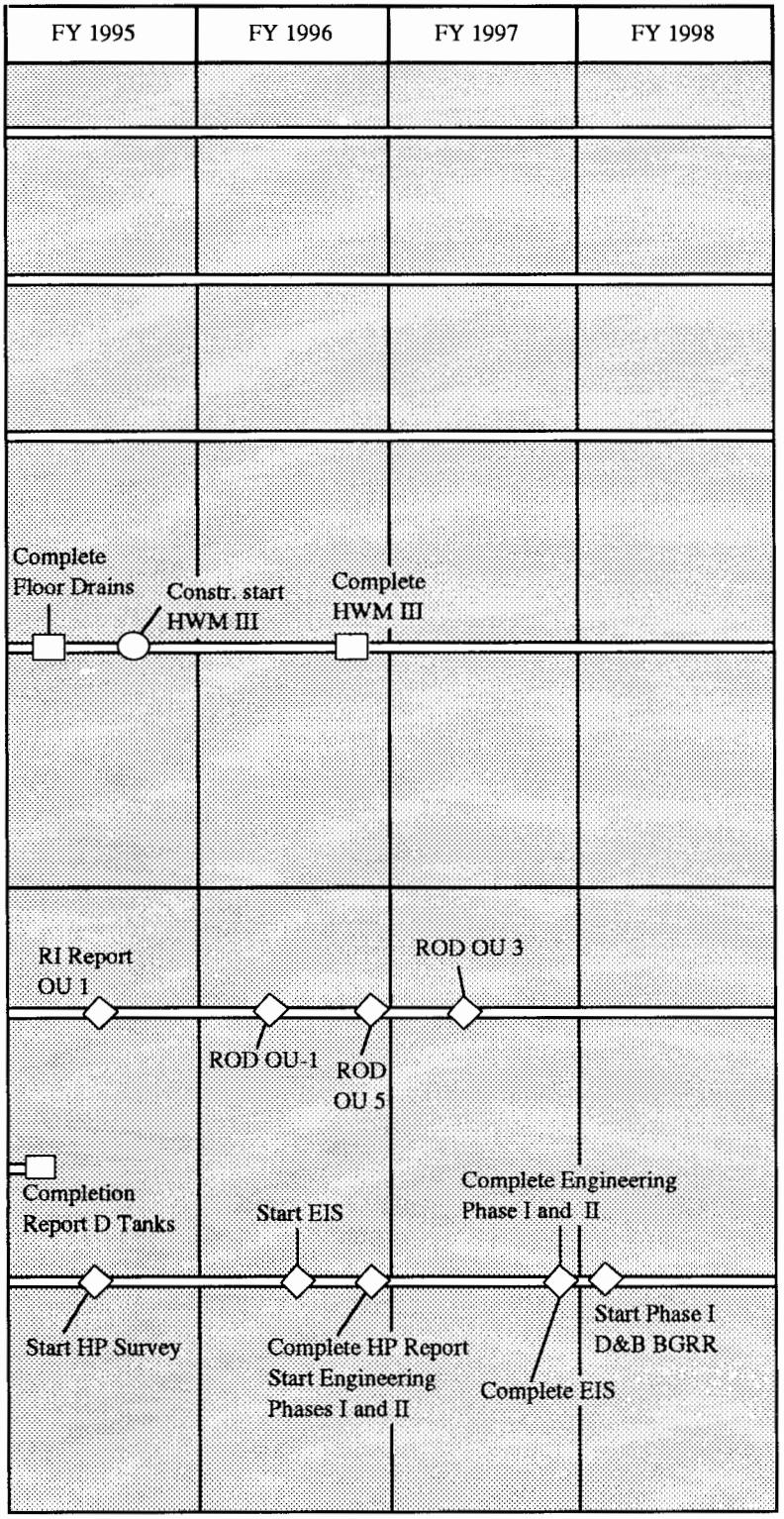
BROOKHAVEN NATIONAL LABORATORY

Long-Term Objectives

Comply with applicable Federal, State and local regulations for hazardous materials.
Complete site remediations.
Ensure no other adverse impacts of operations on the environment.

Five-Year Objectives

Complete removal actions; investigate removal sites.
Complete RI/FS for five OUs.
Initiate remediations at two OUs
Complete construction of new waste management facilities.



Milestone Types

- ○ Unchanged from FY 1993–1997 FYP
- ◇ New since FY 1993–1997 FYP
- □ Changed from FY 1993–1997 FYP

Milestone Status

- ○◇□ Planned
- ●◆■ Complete
- 50 percent complete
- - - - → Information flow

Notes and Acronyms

AM -Action Memorandum
BGRR -Brookhaven Graphite Research Reactor
CDR -Conceptual Design Report
D&B -Dismantle and Burial
EE/CA -Engineering Evaluation/Cost Analysis
FYP -Five-Year Plan
HP -Health Physics
HWM -Hazardous Waste Management
NEPA -National Environmental Policy Act
NYSDEC -New York State Department of Envirionmental Conservation
OU -Operable Unit
PRAP -Proposed Remedial Action Program
RD -Remedial Design
RI/FS -Remedial Investigation/Feasibility Study
ROD -Record of Decision
S/A -Sampling and Analysis
SAP -Sampling and Analysis Plan
SAR -Safety Assessment Report
SOP -Standard Operating Procedures
SOW -Scope of Work
STP -Sewage Treatment Plant
UST Underground Storage Tank
WCF -Waste Characterization Facility
WM -Waste Management
WP -Work Plan

MAJOR MILESTONES

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
Corrective Activities			
• Complete removal of sludge from underground storage tank.	FY 1991	4Q FY 1993[1]	IAG/CERCLA
• Complete Phase III storage tank upgrades.	FY 1994	1Q FY 1994	IAG/CERCLA
• Complete cesspool closure activities.	FY 1994	Eliminated[2]	
• Complete cesspool/UST removal	FY 1994	3Q FY 1994	IAG/CERCLA
Waste Management			
• Complete upgrades to Waste Concentration Facility.	FY 1993	2Q FY 1993	DOE Order 4700.1
• Complete Title I design of Sanitary Upgrades.	FY 1993	Eliminated[3]	
• Complete Floor Drain Reconnection upgrade.	FY 1995	4Q FY 1995[4]	CWA
• Phase I shipment of accumulated waste.	New	4Q FY 1991[5]	RCRA 40 CFR 261, 262 DOE Order 5820.2A, 5400.3-5
• NEPA floor drains.	FY 1993	3Q FY 1993	CWA
• Complete construction of Hazardous Waste Management Facilities (Phase I).	FY 1993	3Q FY 1994[6]	RCRA 40 CFR 261, 262
• Complete construction of Hazardous Waste Management Facilities (Phase III).	FY 1996	3Q FY 1996	RCRA 40 CFR 265, 268 270, TSCA 40 CFR 761
• Apply for NYSDEC Permit to construct Phase II NEPA.	FY 1992	Eliminated[7]	
• Start construction Hazardous Waste Management Facility Phase II/Sanitary I.	FY 1994	Eliminated[7]	
• Complete operations and maintenance manuals for Waste Concentrations Facility (WCF).	New	3Q FY 1992	IAG/CERCLA
• Submit Safety Analysis Report on WCF.	New	3Q FY 1993	DOE Order 5480.SAR
• Add Fire Protection Storage for Hazardous Waste Management Facility (HWMF).	FY 1992	2Q FY 1992	DOE Order 4700.1

MAJOR MILESTONES (Continued)

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
• Submit Safety Analysis Report for HWMF.	New	3Q FY 1993	40 CFR 260 DOE Order 5480.SAR
• Implement HWMF Training Program.	New	3Q FY 1993	RCRA 40 CFR DOE Order 5820.2A
• Initiate construction of "D" waste upgrades.	FY 1992	4Q FY 1993[8]	DOE Order 5820.2A
Environmental Restoration			
• Restart spray-aeration system.	FY 1992	4Q FY 1992	IAG/CERCLA
• Submit Engineering Evaluation/Cost Assessment for D Tank removal.	FY 1991	4Q FY 1992[9]	IAG/CERCLA
• Submit Draft RI/FS Work Plans for OU 1 to EPA/NYS.	FY 1991	2Q FY 1993[10]	IAG/CERCLA
• Initiate RI at OU 1.	FY 1992	1Q FY 1994[11]	IAG/CERCLA
• Submit RI Report for OU 4 to EPA/NYS.	FY 1993	4Q FY 1993	IAG/CERCLA
• Submit FS Report for OU 4 to EPA/NYS.	FY 1993	1Q FY 1994[12]	IAG/CERCLA
• Treatability Studies at OUs.	FY 1993	Eliminated[13]	
• Initiate removals at Aquifer Restoration Area.	FY 1995	1Q FY 1992[14]	IAG/CERCLA
• Start cesspool closure activities.	New	4Q FY 1993[1]	IAG/CERCLA
• Start removing D tanks.	New	2Q FY 1993	IAG/CERCLA
• Completion Report on D tank removal.	FY 1995	2Q FY 1995	IAG/CERCLA
• Issue ROD OU 4.	New	4Q FY 1994	IAG/CERCLA
• Submit RI Report OU 1.	New	2Q FY 1995	IAG/CERCLA
• Issue ROD OU 1.	New	2Q FY 1996	IAG/CERCLA
• Issue ROD OU 5.	New	4Q FY 1996	IAG/CERCLA
• Issue ROD OU 3.	New	2Q FY 1997	IAG/CERCLA

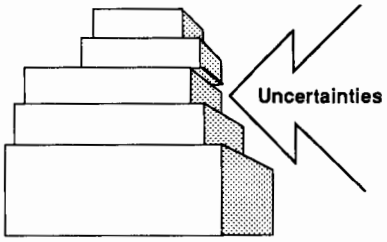
MAJOR MILESTONES (Continued)

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
• Start HP Survey for Brookhaven Graphite Research Reactor.	New	2Q FY 1995	DOE Order 5820.2A
• Start EIS for Brookhaven Graphite Research Reactor.	New	2Q FY 1996	NEPA
• Complete HP Report for Brookhaven Graphite Research Reactor.	New	4Q FY 1996	DOE Order 5820.2A
• Start Engineering Phases I & II D&D of Brookhaven Graphite Research Reactor.	New	4Q FY 1996	DOE Order 5820.2A
• Complete EIS for Brookhaven Graphite Research Reactor.	New	4Q FY 1997	NEPA
• Complete Engineering Phases I & II D&D of Brookhaven Graphite Research Reactor.	New	4Q FY 1997	DOE Order 5820.2A
• Start Phase I D&D of Brookhaven Graphite Research Reactor.	New	1Q FY 1998	DOE Order 5820.2A
Technology Development			
• Support investigation and demonstration of waste management and environmental restoration technologies.	New	1Q FY 1992	DOE Management Initiative

[1] Milestone agreed upon in the IAG.
[2] Cesspools no longer in use, remediation of cesspools will be incorporated into the Environmental Restoration Program.
[3] Project not funded by EM; funding provided by Energy Research.
[4] Milestone identified in previous Five-Year Plans as "Complete Sewage Systems Upgrades."
[5] Milestone complete; current projections for remaining shipments indicate project on schedule.
[6] Milestone identified in previous Five-Year Plans as "Complete Waste Minimization Construction."
[7] Milestone negotiated as part of the IAG with EPA and NYSDEC.
[8] Milestone rolled into Hazardous Waste Management Facility III line item.
[9] Revision of project scope delayed completion of the EE/CA.
[10] Previous Five-Year Plan included a single milestone for OU 4 and OU 1 work plans. Milestone has been separated into two distinct milestones, new schedule for OU 1 approved by EPA and NYSDEC.
[11] New schedule approved by EPA and NYSDEC.
[12] Additional schedule added to allow for finalization of the Remedial Investigation/Risk Assessment Report.
[13] Correction of previous Five-Year Plan milestone: treatability studies are tasks included in the work scope of the RI at each OU; therefore, this milestone is eliminated.
[14] This project is ahead of schedule, milestone was accelerated.

AEA - Atomic Energy Act
CWA - Clean Water Act
IAG - Interagency Agreement between DOE, EPA, and New York State effective (May 27, 1992).
NYS - New York State
NYSDEC - New York State Department of Environmental Compliance
SCSC - Suffolk County Sanitary Code

FIVE-YEAR PLAN ESTIMATES



There are a number of potential activities at Brookhaven National Laboratory that may affect program requirements. These potential activities have not been included in the estimates below due to various uncertainties regarding scope of work, the phasing of regulatory reviews and approval schedules, availability of technology, lack of independent cost reviews and other factors. If further analysis of these uncertainties and potential additional work results in additional funding needs based on legal requirements, DOE will, through mechanisms such as reallocating budgetary resources, requesting funds through the normal appropriation process, supplemental requests or internal reprogramming, pursue funding for these activities, or where appropriate, based on technical reasons, enter into the formal conflict resolution process with regulatory bodies.

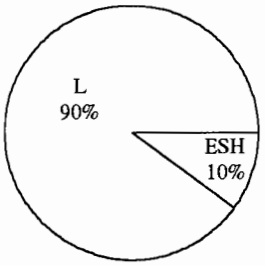
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Corrective Activities/Waste Management	6,855	6,829	12,010	6,829	6,829	6,829	6,829
Environmental Restoration	4,166	6,266	18,551	11,532	15,624	20,939	27,616
Total	11,021	13,095	30,561	18,361	22,453	27,768	34,445

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites.

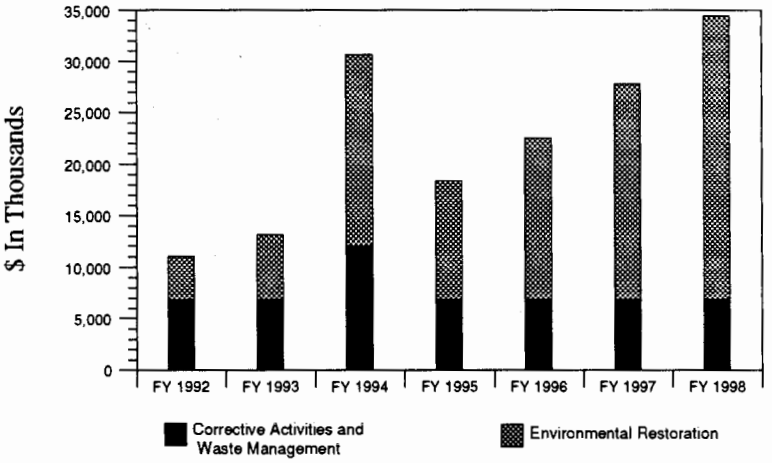
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



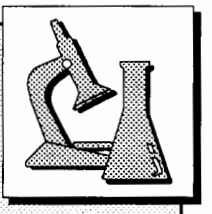
L- Legally Driven Requirements
ESH- Environment, Safety, and Health Requirements

Estimates by Year



For further information regarding Brookhaven National Laboratory, call (708) 252-2013.

CHICAGO FIELD OFFICE
INSTALLATION SUMMARY
COMBINED LABORATORIES



DESCRIPTION

Fermi National Accelerator Laboratory (Fermi), a 6800-acre site located in the far western suburbs 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 beam modes. Major environmental concerns include reducing polychlorinated biphenyls (PCBs) in transformer oil, PCB spill cleanup, and possible chromate cleanup.

Princeton Plasma Physics Laboratory (PPPL), which encompasses 72 acres leased to DOE by Princeton University in Princeton, New Jersey, conducts magnetic confinement plasma physics research and investigates the practical application of fusion power as an energy source. These activities include the experimental demonstration of economical fusion power through the development of the Tokamak series of fusion reactors. The principal environmental activities at PPPL are an underground storage tank (UST) remediation project and a groundwater characterization program.

Ames Laboratory occupies several buildings (336,105 square feet) on the Iowa State University campus in Ames, Iowa. It conducts basic research in materials and chemical sciences, as well as related research in materials reliability and nondestructive evaluation. Ames maintains capabilities for preparing high purity metals, alloys, compounds, and single crystals. The laboratory is applying its experience in materials testing to develop innovative techniques for investigating contaminated sites. A major environmental concern is to characterize and, if necessary, to remediate a closed chemical waste disposal site at the facility.

STRATEGIC OUTLOOK

Fermi, PPPL, and Ames Laboratory are not under Federal Facility Compliance Agreements. The laboratories comply with applicable laws, regulations, and requirements aimed at protecting public health and the environment. To continue their primary missions of fundamental and applied research, the laboratories must treat, store, and ship their hazardous and radioactive wastes in an environmentally sound and effective manner for off-site disposal .

Fermi is currently operating under a RCRA Part B Permit. Fermi will be remediating potential problems from chromate contaminated soil and past Main Ring PCB spills, pending response from EPA on preliminary risk assessments. In addition, Fermi will conduct a RCRA Facility Investigation of 17 identified solid waste management units for possible environmental problems.

At PPPL, the Tokamak Fusion Test Reactor (TFTR) will be replaced by a new machine that will be in the TFTR test cell; construction is scheduled to start in FY 1997. Decontamination and decommissioning (D&D) of the current TFTR, starting in FY 1995, will generate considerable waste during this five-year planning period.

At Ames, site characterization of a closed chemical disposal site is scheduled for FY 1992 through 1993. Results of this investigation will indicate what, if any, remediation may be necessary for the chemical disposal site.

STRATEGIC OUTLOOK (Continued)

Ames will develop a site work plan in FY 1993 to address removal of an existing UST used for diesel fuel storage. Soil around the tank was contaminated by a UST that was removed 20 years ago. This activity is being driven by the State of Iowa Administrative Code.

Ames will continue to focus on waste minimization activities. Wastes generated include those found in a typical small research laboratory doing both physical and chemical research plus some legacy low-level radioactive waste. Ames Laboratory monitors incoming chemicals, maintains chemical inventories, and disposes of chemical wastes using certified waste disposal vendors. Radioactive wastes are sent to a DOE facility in Hanford, Washington, for disposal.

ACCOMPLISHMENTS (FY 1991 – 3Q FY 1992)

Corrective Activities

- Fermi: Completed cleanup of 30 Sauk leaking USTs and obtained approval from Illinois EPA.

Waste Management

- Fermi: Obtained RCRA Part B Permit to store specific hazardous wastes at Site 55.
- Fermi: Disposed of nine transformers; PCB concentration reduced below 50 ppm in 15 more transformers.
- PPPL: Shipped 13,000 gallons (160,000 pounds) of hazardous waste for disposal.
- PPPL: Completed backfill of east and west excavations for UST.
- Ames: Identified and disposed of significant quantities of legacy hazardous wastes.

Environmental Restoration

- Fermi: Submitted preliminary risk assessment on chromate contamination to EPA.
- PPPL: Installed monitoring wells as a preliminary step in characterization of the groundwater contamination.
- Ames: State of Iowa approved RI/FS Work Plan (Site Assessment Plan) for Chemical Disposal Site.

Technology Development

- Laboratories within the Chicago complex will continue an aggressive research, development and demonstration program for innovative technology to be applied to major problems throughout the DOE complex.
- Ames: Completed design of a mobile laser ablation/inductive-coupled plasma optical spectrometer laboratory.

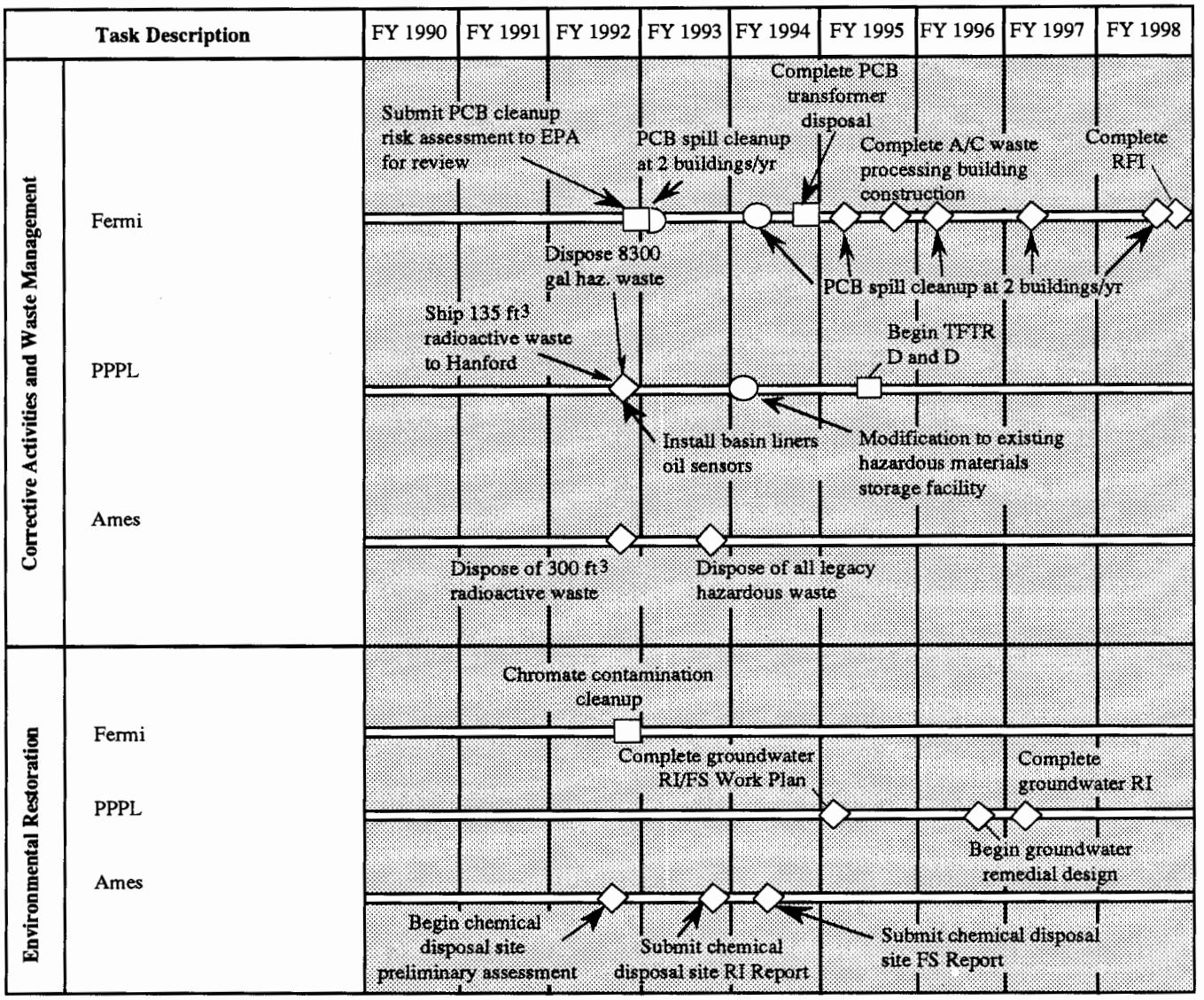
CHICAGO FIELD OFFICE PROGRESS CHART COMBINED LABORATORIES

Long-Term Objectives

Complete Remedial Activities.
Continue collection and disposal of hazardous, mixed and radioactive waste.

Five-Year Objectives

Complete cleanup of chromate contamination at Fermi.
Complete groundwater Remedial Investigation at PPPL.
Initiate TFTR D and D at PPPL.
Complete site characterization of the CDS at Ames.



Milestone Types	Milestone Status
○ Unchanged from FY 1993–1997 FYP	○ ◇ □ Planned
◇ New since FY 1993–1997 FYP	● ◆ ■ Complete
□ Changed from FY 1993–1997 FYP	50 percent complete
	Information flow

Notes and Acronyms

CDS - Chemical Disposal Site
FS - Feasibility Study
FYP - Five-Year Plan
PCB - polychlorinated biphenyl
RFI - RCRA Facility Investigation
RI - Remedial Investigation
TFTR - Tokamak Fusion Test Reactor

MAJOR MILESTONES

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
Corrective Activities			
• Fermi: Submit PCB cleanup risk assessment to EPA for review.	FY 1991	3Q FY 1992[1]	TSCA 40 CFR 761.120(a) (1)
Waste Management			
• Fermi: Complete disposal of PCB transformers.	FY 1991	4Q FY 1994[2]	TSCA 40 CFR 761.120(a) (1)
• Fermi: Complete PCB spill cleanup at two buildings/year.	New	4Q FY 1993-1999[3]	TSCA 40 CFR 761.120(a) (1)
• Fermi: Complete RCRA Facility Investigation.	New	4Q FY 1998	RCRA Part B Permit
• Fermi: Complete waste processing building construction.	New	4Q FY 1995[4]	DOE Order 5480.11, 6430.1a
• PPPL: Ship 135 cubic feet of radioactive waste to Hanford.	New	4Q FY 1992	DOE Order 5820.2A
• PPPL: Dispose of 8300 gallons (125,000 pounds) hazardous waste.	New	4Q FY 1992	RCRA 40 CFR 260 NJAC 7:26-9.3
• PPPL: Complete modifications to existing materials storage facility.	New	1Q FY 1994	Executive Order 11988 10 CFR 1022
• PPPL: Complete installation of basin liner and oil sensors.	FY 1992	4Q FY 1992[5]	NJAC 7:14a-3.8 40 CFR 122.26 (b) (14)
• PPPL: Begin TFTR D&D.	New	2Q FY 1995[6]	DOE Order 5820.2A
• Ames: Dispose of 300 cubic feet of radioactive waste.	New	4Q FY 1992	DOE Order 5820.2A
• Ames: Dispose of all legacy hazardous waste.	New	4Q FY 1993	RCRA 40 CFR 261.5
• All: Complete initial waste minimization assessments.	FY 1992	Eliminated[7]	
Environmental Restoration			
• Fermi: Complete chromate contamination cleanup.		4Q FY 1992[8]	RCRA Part B Permit CERCLA Sect. 104
• PPPL: Complete Groundwater (GW) RI/FS Work Plan.	New	1Q FY 1995	NJAC Title 7

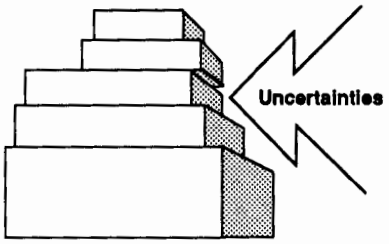
MAJOR MILESTONES (Continued)

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
• PPPL: Complete GW Remedial Investigation.	New	1Q FY 1997	NJAC Title 7
• PPPL: Begin GW remedial design.	New	3Q FY 1996	NJAC Title 7
• Ames: Complete contaminated soil removal.	FY 1993	Eliminated[9]	
• Ames: Submit RI Report for the Chemical Disposal Site to DOE.	New	4Q FY 1993	IAC Sect. 567, Ch. 133
• Ames: Submit FS Report for the Chemical Disposal Site to DOE.	New	2Q FY 1994	IAC Sect. 567, Ch. 133

[1] EPA requested additional sampling for inclusion in Preliminary Remedial Action Report.
[2] Disposal of transformers initiated FY 1991 and will be completed FY 1994.
[3] Fermi must wait for EPA review of PRA report and recommendations for cleanup. Cleanup will be at a rate of two buildings/year during normal accelerator shutdown for maintenance.
[4] Assumes construction starts April 1994.
[5] Liner installation delayed from early to late FY 1992 because site conditions found to differ from anticipated, resulting in design changes.
[6] Energy Research is supporting the dismantling and packaging of TFTR and its replacement with a follow-on device. Waste Management will fund the transportation, disposal and associated labor costs for the TFTR.
[7] Assessments restructured pending implementation of Energy Research Waste Minimization Program.
[8] Completion of chromate cleanup pending EPA response to Fermi's preliminary risk assessment.
[9] Removed pending results of Remedial Investigation.

CFR - *Code of Federal Regulations*
IAC - Iowa Amended Code
NJAC - New Jersey Administrative Code
TSCA - Toxic Substances Control Act

FIVE-YEAR PLAN ESTIMATES



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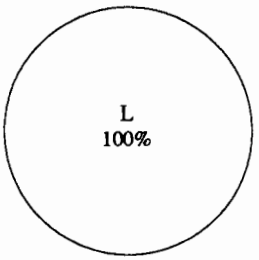
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Corrective Activities/Waste Management	5,061	6,778	12,157	4,891	4,891	4,891	4,891
Environmental Restoration	1,025	3,254	1,796	11,439	2,671	2,664	3,032
Total	6,086	10,032	13,953	16,330	7,562	7,555	7,923

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites.

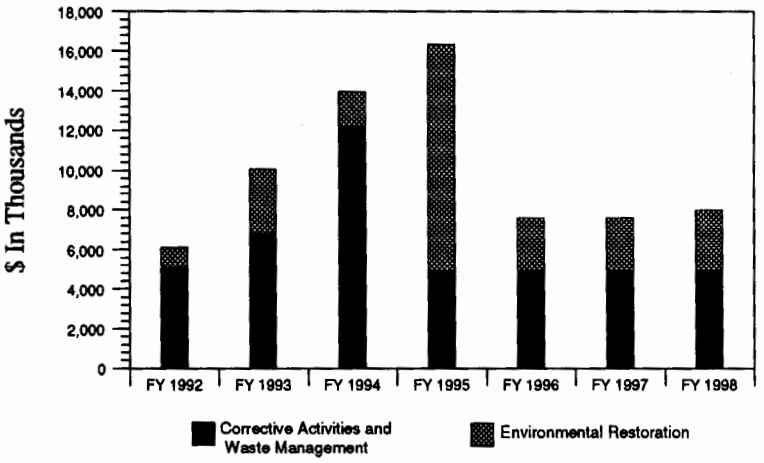
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



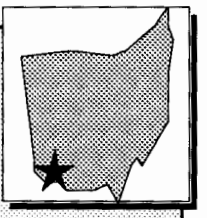
L- Legally Driven Requirements

Estimates by Year



For further information regarding Combined Laboratories, call (708) 252-2031.

FERNALD FIELD OFFICE
INSTALLATION SUMMARY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT



DESCRIPTION

The Fernald Environmental Management Project (FEMP) near Fernald, Ohio, located 17 miles northwest of Cincinnati, is a large-scale facility with a primary mission that has shifted from production of uranium metals and compounds to completion of environmental restoration. Cleanup of the 1050-acre site and the support of waste management and base service activities are now the major site activities.

The FEMP major site activities also include the cleanup at the Reactive Metals, Incorporated Extrusion Plant (RMI) in Ashtabula, Ohio. This seven-acre facility previously extruded uranium metal shapes.

STRATEGIC OUTLOOK

FEMP was placed on the National Priorities List in November 1989, and site cleanup is now being conducted under CERCLA. Several regulatory agreements are being implemented at the site, including the Amended Consent Agreement with EPA, a Consent Decree and proposed amendments with the State of Ohio, a Federal Facility Compliance Agreement with EPA, and a Federal Facilities Agreement for Control and Abatement of Radon-222 emissions. RMI is privately owned and is undergoing restoration under the provisions of a RCRA Part B Permit and decontamination and delicensing under the previous Regulatory Guide 3.65, issued by the Nuclear Regulatory Commission (NRC) for decommissioning of NRC licensed facilities. RMI currently has an NRC-material license.

FEMP has a current roadmap reflecting the integration of all activities and priorities. The project has been divided into two installations for EM (FEMP and RMI) with separate ADSs and summary subprojects, including remedial action; landlord; treatment, storage, and disposal (TSD) facilities; project management; and decontamination and decommissioning (D&D).

Waste management activities and TSD facilities include the shipment of backlog waste and the Engineered Waste Management Facility. The subproject level divides the remedial action work into five operable units (OUs) as described in the Amended Consent Agreement.

D&D activities include work at RMI.

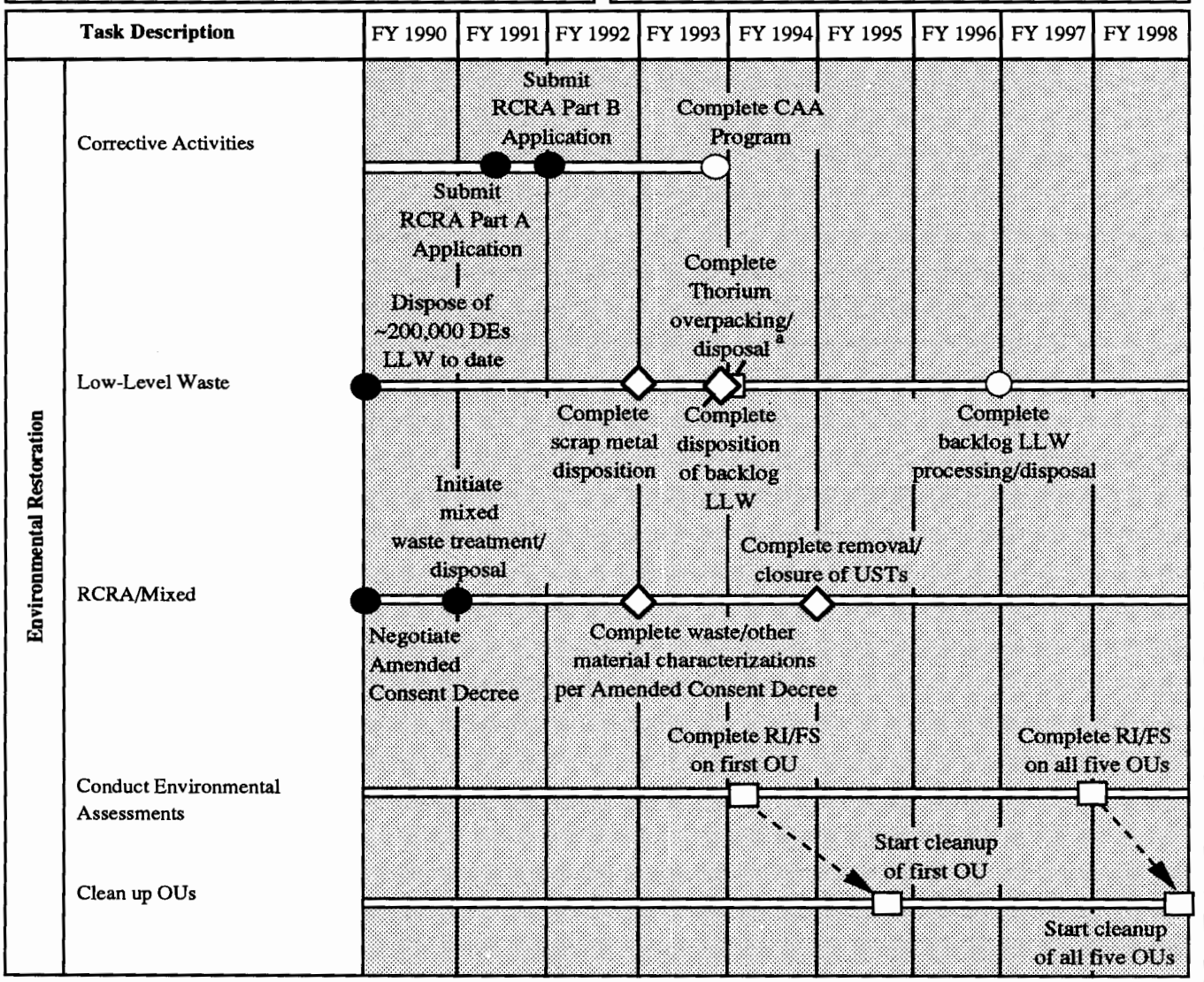
ACCOMPLISHMENTS (FY 1991 – 3Q FY 1992)

- Completed negotiations for an amendment of the Consent Agreement under CERCLA Section 120 and 106(a). Revised the scope and schedule of the Amended Consent Agreement to show the Remedial Investigation/ Feasibility Study (RI/FS) schedules and Records of Decision (RODs) being extended. Eleven removal actions were identified, and work on them is progressing. An additional seven removal actions were proposed in the annual review for a total of 27 removal actions. All of the new removal action work plans were submitted on or ahead of schedule.
- Completed six Amended Consent Agreement removal actions at Silos 1 and 2, K-65 Decant Sump Tank, Waste Pit 6 Exposed Material, the Inactive Fly Ash Pile/Southfield Area, Waste Pit Area Stormwater Runoff, and Waste Pit 5 Experimental Treatment Facility.
- Shipped approximately 82,000 drum equivalents of low-level waste, which met the waste acceptance criteria to Nevada Test Site (NTS) in FY 1992 through July 31, 1992. The total volume of waste to be shipped to NTS from FEMP has not been determined. Initiated shipments of low-level thorium wastes to NTS.
- Completed all ten Proposed Amended Consent Decree milestones including: submission of a revision to the RCRA Part A and B Permit applications; issuance of quarterly technical reports; submission of a Hazardous Waste Management Unit Review for Pit 5; performance of drum inspections as required; movement of stored materials under cover from open pads; completion of process knowledge evaluations; submission of a report on thorium materials; and completion of a waste disposal plan.

PROGRESS CHART FOR FERNALD FIELD OFFICE: FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

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.



Milestone Types	Milestone Status
○ Unchanged from FY 1993–1997 FYP	○ ◇ □ Planned
◇ New since FY 1993–1997 FYP	● ◆ ■ Complete
□ Changed from FY 1993–1997 FYP	50 percent complete
	Information flow

Notes and Acronyms

[a] Contingent Upon NTS approval and HQ declaration of thorium material as waste

CAA - Clean Air Act
DEs - Drum Equivalents
FYP - Five-Year Plan
LLW - low-level waste
NTS - Nevada Test Site
OUs - Operable Units
RI/FS - Remedial Investigation/Feasibility Study
UST - underground storage tanks

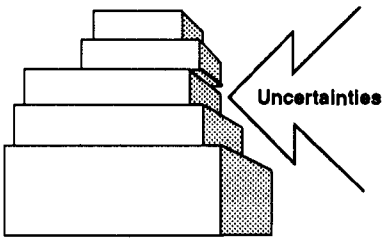
MAJOR MILESTONES

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
Environmental Restoration			
• Completed Clean Air Program.	4Q FY 1993	4Q FY 1993	CD/ACA
• Complete Waste Evaluations per the proposed Amended Consent Decree.	4Q FY 1992	4Q FY 1992	CD and Proposed Amendment Sect. 3.5.1d, p.4
• Complete low-level thorium waste overpacking/disposal	4Q FY 1994	4Q FY 1994	ACA Sect. IX, p.28
• Complete backlog low-level waste (LLW) processing/disposal.	1Q FY 1996	1Q FY 1996	ACA Sect. IX, p.28
• Submit Remedial Design Work Plan to EPA - first OU (OU 2, Other Waste Units).	3Q FY 1992	1Q FY 1995[1]	ACA Sect. XI, p. 43
• Submit Remedial Action Work Plan to EPA - first OU (OU 2).	3Q FY 1992	2Q FY 1995[1]	ACA Sect. XI, p.43
• Submit Remedial Design Work Plan to EPA - last OU (OU 3 - Former Production Area).	4Q FY 1992	1Q FY 1998[1]	ACA Sect. XI, p.43
• Submit Remedial Action Work Plan to EPA - last OU (OU 3).	1Q FY 1993	2Q FY 1998[1]	ACA Sect. XI, p.43
• Initiate Remedial Actions first OU (OU 2).	2Q FY 1993	4Q FY 1995[1]	ACA Sect. XI, p.43
• Initiate Remedial Actions - last OU (OU 3).	4Q FY 1993	1Q FY 1999[1]	ACA Sect. XI, p.43
• Complete remediation for first waste unit - OU 2.	1Q FY 1995	3Q FY 1997[1]	ACA Sect. XI, p.43
• Complete remediation - first OU (OU 2).	1Q FY 1992	1Q FY 2000[1]	ACA
Technology Development			
• Support investigation and demonstration of environmental restoration technologies.	New	1Q FY 1996	DOE Management Initiative

[1]Revised per ACA negotiated September 1991.

ACA - Amended Consent Agreement
CD - Consent Decree

FIVE-YEAR PLAN ESTIMATES



There are a number of potential activities at Fernald Environmental Management Program (FEMP) that may affect program requirements. These potential activities have not been included in the estimates below due to various uncertainties regarding scope of work, the phasing of regulatory reviews and approval schedules, availability of technology, lack of independent cost reviews and other factors. At FEMP, uncertainties are related to impacts due to the transition to our environmental restoration and management contractor and the scope of site assessment activities in the former production area. If further analysis of these uncertainties and potential additional work results in additional funding needs based on legal requirements, DOE will, through mechanisms such as reallocating budgetary resources, requesting funds through the normal appropriation process, supplemental requests or internal reprogramming, pursue funding for these activities, or where appropriate, based on technical reasons, enter into the formal conflict resolution process with regulatory bodies.

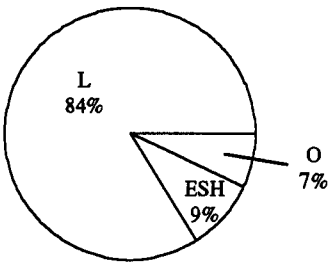
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Environmental Restoration	211,402	307,933	338,678	372,546	409,801	450,781	495,859
Total	211,402	307,933	338,678	372,546	409,801	450,781	495,859

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites.

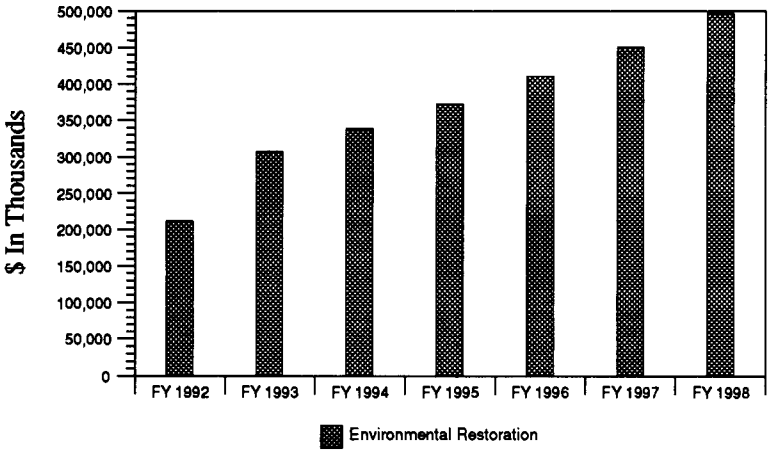
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



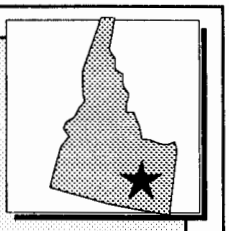
L- Legally Driven Requirements
ESH- Environment, Safety, and Health Requirements
O- Other Desirable Activities

Estimates by Year



For further information regarding Fernald Environmental Management Project, call (513) 738-6697.

IDAHO FIELD OFFICE
INSTALLATION SUMMARY
IDAHO NATIONAL ENGINEERING LABORATORY



DESCRIPTION

Idaho National Engineering Laboratory (INEL) is situated in southern Idaho along the western edge of the Eastern Snake River Plain and encompasses a desert area of approximately 890 square miles. 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, fuel processing plants, waste management facilities, and other supporting facilities. Primary activities at INEL are environmental restoration, waste management, and technology development.

STRATEGIC OUTLOOK

INEL has a long tradition of pioneering new advances in science, having been the location of 52 reactors during the past 40 years. However, the nature of programs at INEL has significantly broadened in recent years to include a multitude of nuclear and nonnuclear programs. INEL is continuing to play a vital role in areas of nuclear safety research, advanced energy concepts, waste technologies, national defense, and new space technology. In addition, a major thrust will focus on EM efforts over the foreseeable future.

Implicit to the mission of Environmental Restoration and Waste Management Programs at INEL is the commitment to environmentally sound operations and to the health and safety of the public and workers. To accomplish this mission, the Environmental Restoration and Waste Management Programs will work together to (1) clean up environmental sites from past operations and (2) properly manage waste products to ensure that additional contamination requiring future cleanup is avoided. In addition, aggressive development of new technologies is being pursued to ensure that waste is properly handled with the long-term perspective in mind.

Waste Management Program activities are involved with minimization, treatment, storage, and disposal of radioactive, hazardous, mixed, and solid municipal wastes generated from current or past operations. Waste Management goals are to (1) minimize the volume of waste generated, (2) treat the waste to reduce the volume and eliminate or reduce the hazard, (3) store waste only as a short-term option, and (4) provide final disposal using proven environmentally safe methods.

To accomplish these goals, the INEL Waste Management Program instituted an aggressive waste minimization program to educate waste generators in areas of material substitution, waste handling and avoidance, and to implement a comprehensive recycling program. Treatments, such as the calcining operation conducted at the Idaho Chemical Processing Plant, minimize waste volumes and stabilize waste products. Technology development is being accelerated at the Idaho Chemical Processing Plant for calcine immobilization and preparation of spent nuclear fuel for ultimate disposal in a national repository.

Storage modules are being built to ensure that storage of transuranic (TRU)-contaminated wastes, currently in retrievable storage at the Radioactive Waste Management Complex, is properly performed until planned shipments begin to the Waste Isolation Pilot Plant (WIPP). RCRA- compliant storage facilities will be built to store mixed waste. Dry cask storage modules are being designed to provide improved storage of spent nuclear fuel. Disposal facilities for low-level waste are being designed to provide final disposition in proven environmentally safe enclosures.

STRATEGIC OUTLOOK (Continued)

Environmental restoration activities include remediation of inactive waste sites in compliance with CERCLA, remediation of underground storage tanks, and decontamination and decommissioning (D&D) of surplus facilities. The goals of the Environmental Restoration Program are (1) to complete remediation of contaminated sites to support delisting of INEL from the National Priorities List by 2019, (2) to complete D&D of currently identified surplus facilities by 2005, (3) to provide postclosure monitoring to verify continued compliance with environmental regulations, and (4) to conduct all activities in compliance with Federal and State regulations and DOE Orders.

To accomplish these goals, the INEL Environmental Restoration Program is working closely with EPA Region 10 and the State of Idaho to implement the Federal Facilities Agreement and Consent Order (FFA/CO), which was signed in December 1991. Aggressive plans are in place to achieve early remediation of sites that represent the greatest risk to workers and the public. For sites with sufficient information to support a decision regarding remediation, streamlined documentation and decision processes have been developed to support early remediation.

ACCOMPLISHMENTS (FY 1991 – 3Q FY 1992)

Corrective Activities

- Completed Environmental Corrections Phase IIB at the Idaho Chemical Processing Plant. This activity involved installing secondary containment on buried waste lines at the Idaho Chemical Processing Plant. The remaining efforts are to be completed under Waste Management.
- Completed construction of the Liquid Effluent Treatment and Disposal (LETD) facility. Facility startup will begin and will continue under the Waste Management Program. The LETD facility will eliminate residual discharges of hazardous and radioactive contaminants into wastewater percolation ponds.

Waste Management

- Received authorization to load Transuranic Package Transportation with Bin 1. The first bin of TRU waste has been loaded, awaiting notification from WIPP to begin the five-year test phase and initiate shipments to WIPP.
- Relocated all clean lead to the storage facility for inventory management. Completion of this activity allows for centralized management and control of the stockpiled clean lead at INEL.
- Processing Experimental Pilot Plant (PREPP) facility standby completed. PREPP standby completes the test phase of TRU treatment at PREPP. The knowledge gained from these tests will be factored into the Idaho Waste Processing Facility (IWPF) Functional and Operational Requirements.
- Completed draft Environmental Resource Document to aid in the preparation of the National Environmental Policy Act Environmental Impact Statement (EIS). The Environmental Resource Document serves as a source of information needed for various functions, including the EIS development.
- Developed and completed the draft Waste Stream Roadmap. Roadmap activities provide the strategic planning function for analyzing long-term issues facing INEL. Use of the roadmap will ensure that the Waste Management Program addresses key issues and works toward resolution.
- Assisted in reducing the use of hazardous solvent by ten percent. This activity supports Waste Minimization Program goals aimed at reducing or eliminating waste generation.

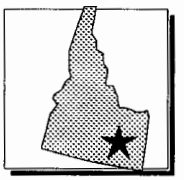
ACCOMPLISHMENTS (Continued)

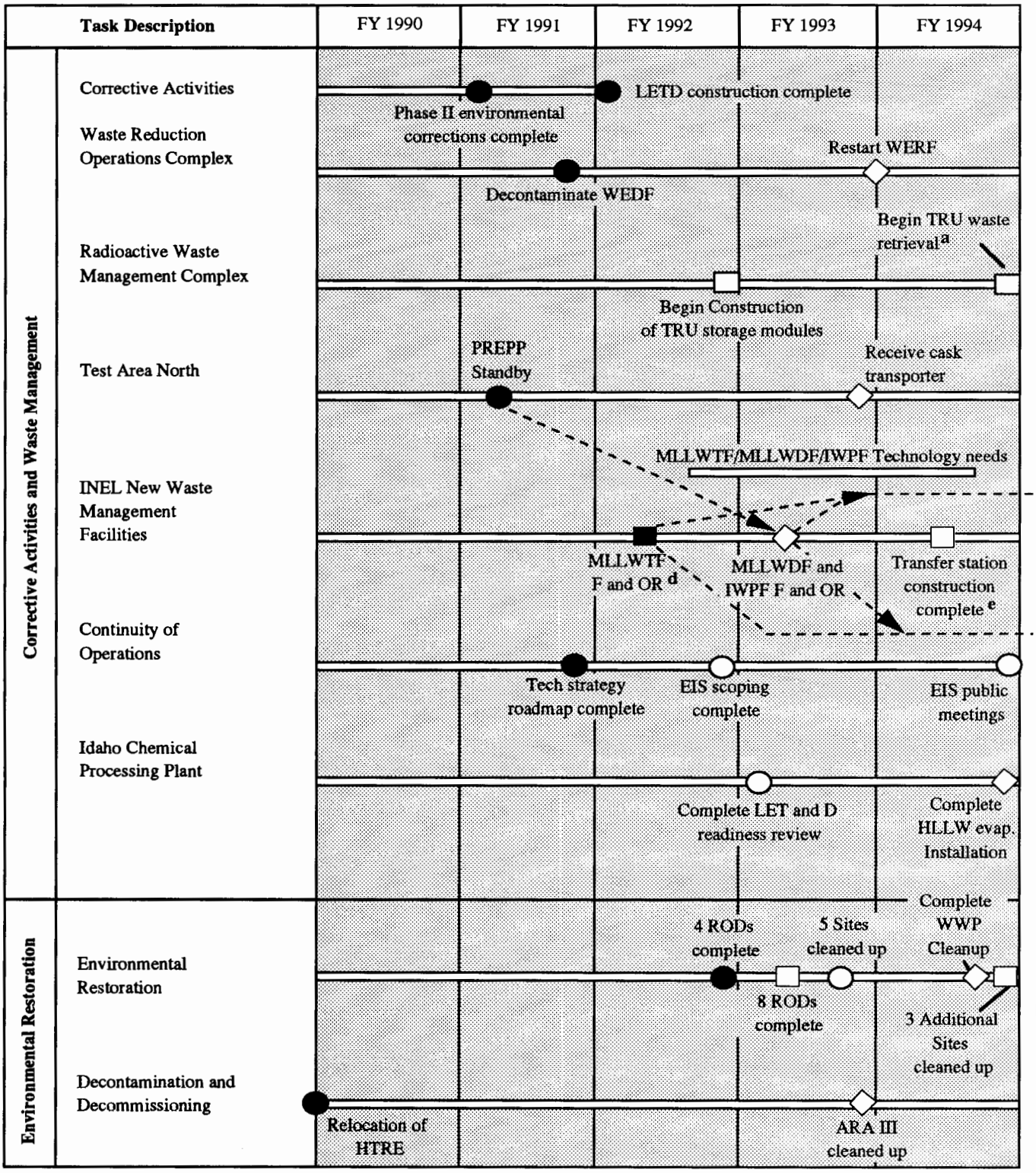
- Responded to the descision to phase out reprocessing of Spent Nuclear Fuel (SNF) by developing ICPP SNF/ Waste Technology Development Plan and initiating an evaluation of the tank farm replacement project.
- Began detailed design of full-scale nitrogen oxides (NOx) abatement facility.
- Completed construction of the Liquid Effluent Treatment and Disposal facility.
- Completed Environmental Assessment for the Transuranic Storage Area Retrieval Enclosure and RCRA Storage Facilities. Completion of this task and the approval of the Preliminary Safety Assessments by DOE Headquarters shall pave the way for construction and operation of these facilities.

Environmental Restoration

- Received and evaluated proposals from contractors to remediate Pit 9. This remediation subcontract supports cleanup of TRU-contaminated waste in Pit 9 at the RWMC. This is the first step in INEL's largest remediation project and is being initiated six years ahead of schedule.
- Signed Record of Decision (ROD) for the Test Reactor Area Warm Waste Pond. This is the first ROD to be signed under the Federal Facilities Agreement/Consent Order and represents one of the primary release sites at INEL. Plans for remediation of the Warm Waste Pond using physical separation and chemical treatment technology are on schedule.
- Completed four additional RODs in FY 1992, including (1) the Test Area North Groundwater Interim Action, (2) the Ordnance Site Interim Action, (3) Power Burst Facility Operable Units 8 and 10 Interim Action and (4) Central Facilities Area Motor Pool Pond Interim Action.
- Obtained approval of the FFA/CO. The FFA/CO supersedes the RCRA-based Consent Order and Compliance Agreement. It provides for more comprehensive remediation of hazardous and radioactive contamination at INEL and satisfies both Federal and State regulatory requirements.
- Completed development and validation of a DOE Major System Acquisition Baseline for the Environmental Restoration Program budget for FY 1994.
- Initiated remediation of INEL. Remediation of three sites will be completed in FY 1992, including asbestos contamination at the Test Area North, radioactive soil contamination at the Test Reactor Area, and laboratory chemicals and related contamination disposed near the Test Area North. In addition, a total of 3000 gallons of water from the Test Area North Injection Well, contaminated with radionuclides and hazardous substances, was processed to meet treatment standards.
- Completed D&D of the Boiling Water Reactor Experiment V Turbine Building. This facility was completely decontaminated and returned to "green fields" condition, allowing unrestricted use of the site.
- Developed an Environmental Restoration Roadmap that documents environmental restoration strategic planning. It also identifies and provides a framework to resolve issues impacting successful remediation at INEL.

IDAHO FIELD OFFICE
PROGRESS CHART
IDAHO NATIONAL ENGINEERING LABORATORY

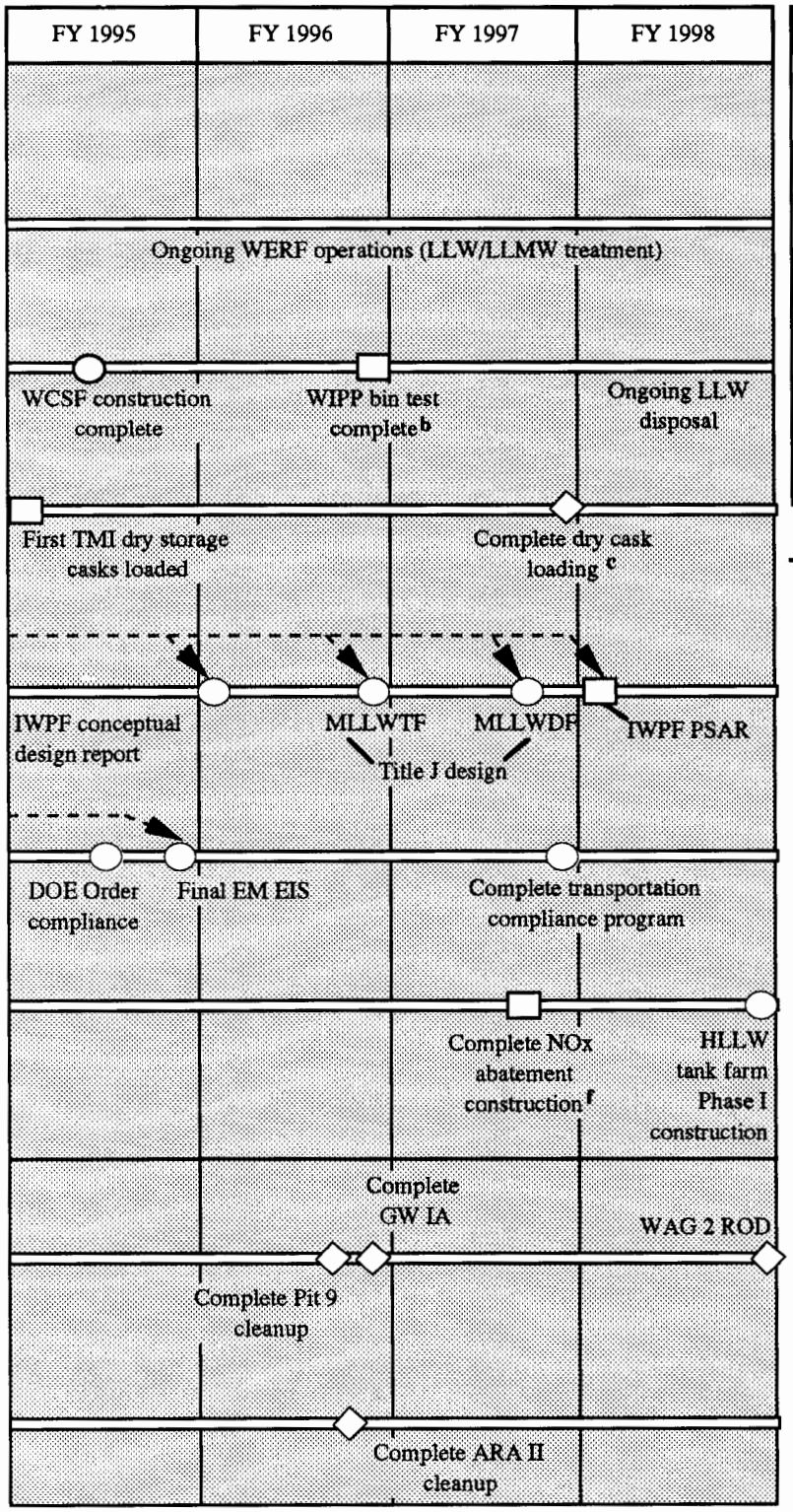




IDAHO NATIONAL ENGINEERING LABORATORY

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 waste retrieval.
Complete construction of HLLW tank farm, Phase 1.



Milestone Types

- ○ Unchanged from FY 1993–1997 FYP
- ◇ New since FY 1993–1997 FYP
- □ Changed from FY 1993–1997 FYP

Milestone Status

- ○◇□ Planned
- ●◆■ Complete
- 50 percent complete
- - - - → Information flow

Notes and Acronyms

ARA - Auxiliary Reactor Area
F&OR - Functional and Operational Requirements
FYP - Five-Year Plan
GW - groundwater
HLLW - high-level liquid waste
HTRE - Heat Transfer Reactor Experiment
IWPF - Idaho Waste Processing Facility
LETD - Liquid Effluent Treatment and Disposal
LLW - low-level waste
MLLWDF - Mixed Low-Level Waste Disposal Facility
MLLWTF - Mixed Low-Level Waste Treatment Facility
NOx - nitrogen oxides
PREPP - Process Experimental Pilot Plant
PSAR - Preliminary Safety Analysis Report
ROD - Record of Decision
TMI - Three Mile Island
TRU - Transuranic
TSA - Technical Support Area
WAG - Waste Area Grouping
WCF - Waste Calcining Facility
WEDF - Waste Engineering Development Facility
WERF - Waste Experimental Reduction Facility
WIPP - Waste Isolation Pilot Plant
WWP - Warm Waste Pond

[a] Slipped because of delay in TSA-Retrieval Enclosure construction
[b] WIPP bin test extended due to WIPP uncertainties
[c] Initiation of Dry Cask Storage slipped due to construction schedule extension
[d] F&OR completed three months ahead of schedule
[e] Delayed construction due to schedule extension
[f] Delayed construction due to schedule extension

MAJOR MILESTONES

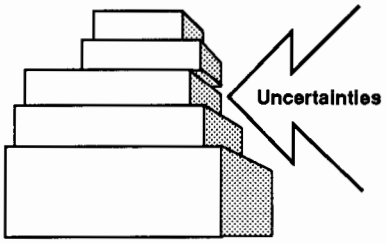
	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
Waste Management			
• Begin construction of TRU waste storage modules.	4Q FY 1991	4Q FY 1992[1]	FFA/CO 40 CFR 265
• Start up the Liquid Effluent Treatment and Disposal facility.	1Q FY 1992	1Q FY 1993[2]	40 CFR 265
• Support WIPP Bin Test (150 drums, 8 bins).	4Q FY 1993	TBD[3]	WIPP Agreement ID 16.01.5258
• Restart WERF operations.	New	4Q FY 1993	40 CFR 265 ID 16.011012
• Complete Sanitary Waste Transfer Station.	1Q FY 1993	3Q FY 1994[4]	40 CFR 258
• Complete TSA-Retrieval Enclosure construction.	New	4Q FY 1994	40 CFR 265
• Initiate loading Test Area North water pool fuel into Dry Storage Casks.	2Q FY 1995	1Q FY 1995	DOE Order 5480.1B
• Complete construction of Waste Characterization and Storage Facility.	2Q FY 1995	2Q FY 1995	40 CFR 265
• Complete final INEL sitewide EIS/Schedule.	4Q FY 1995	4Q FY 1995	42 CFR 4321 10 CFR 1021
• WIPP Bin Test Program complete.	4Q FY 1995	TBD[3]	WIPP Agreement ID 16.01.5258
• Replace incinerator combustion chambers at WERF.	2Q FY 1996	Eliminated[5]	
• Initiate startup of full-scale NOx abatement facility.	4Q FY 1996	4Q FY 1997[4]	40 CFR 265 CAA
• Construct and place four HLLW storage tank into service.	2Q FY 1999	4Q FY 1998	40 CFR 265
• Complete TMI Dry Storage Cask loading.	New	4Q FY 1997	DOE Order 5480.1B/ DOE 6430.1A
• Prepare IWPF PSAR.	4Q FY 1997	1Q FY 1998[6]	DOE Order 5820.2A 40 CFR 268
• Complete construction of Hazardous Waste Storage Facility.	New	1Q FY 1998	40 CFR 262/ 40 CFR 264
• Complete HLLW evaporator installation.	New	4Q FY 1994	40 CFR 265

MAJOR MILESTONES (Continued)	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
Environmental Restoration			
• Complete four RODs.	4Q FY 1992	4Q FY 1992	FFA/CO CERCLA Sect. 120
• Complete cleanup at five sites.	4Q FY 1993	4Q FY 1993	FFA/CO CERCLA Sect. 120
• Complete four RODs.	4Q FY 1993	2Q FY 1993[7]	FFA/CO CERCLA Sect. 120
• Complete one ROD.	4Q FY 1995	2Q FY 1994[7]	FFA/CO CERCLA Sect. 120
• Complete cleanup at three sites.	4Q FY 1996	4Q FY 1994[7]	FFA/CO CERCLA Sect. 120
• Complete Pit 9 cleanup.	New	3Q FY 1996	FFA/CO CERCLA Sect. 120
• Complete Warm Waste Pond cleanup.	New	4Q FY 1994	FFA/CO CERCLA Sect. 120
• Complete D&D of ARA III.	New	4Q FY 1993	DOE Order 5820.2A
• Complete D&D of ARA II.	New	4Q FY 1996	DOE Order 5820.2A
• Complete Test Area North groundwater interim action.	New	4Q FY 1996	FFA/CO CERCLA Sect. 120
• Complete WAG 2 ROD.	New	4Q FY 1998	FFA/CO CERCLA Sect. 120
Technology Development			
• Support investigation and demonstration of waste management and environmental restoration technologies.	New	1Q FY 1995	DOE Management Initiative

[1]Delay because of schedule extension for National Environmental Policy Act review.
[2]Delay to resolve land disposal restriction issues.
[3]Pending decision to begin WIPP testing.
[4]Delay based on reevalutaion of construction schedule.
[5]The WERF incinerator refractory replacement is now scheduled for FY 1992–1993.
[6]Delayed because of schedule extension.
[7]Accelerated because of "Bias for Action" Program activities.

CAA - Clean Air Act
CFR - *Code of Federal Regulations*
FFA/CO - Federal Facilities Agreement/Consent Order
ID - Idaho Code

FIVE-YEAR PLAN ESTIMATES



There are a number of potential activities at Idaho National Engineering Laboratory (INEL) that may affect program requirements. These potential activities have not been included in the estimates below due to various uncertainties regarding scope of work, the phasing of regulatory reviews and approval schedules, availability of technology, lack of independent cost reviews and other factors. At INEL, uncertainties in part are related to new mission activities at the Idaho Chemical Processing Plant and the Pit 9 industry technology proof of process and management associated with Pit 9 cleanup efforts. If further analysis of these uncertainties and potential additional work results in additional funding needs based on legal requirements, DOE will, through mechanisms such as reallocating budgetary resources, requesting funds through the normal appropriation process, supplemental requests or internal reprogramming, pursue funding for these activities, or where appropriate, based on technical reasons, enter into the formal conflict resolution process with regulatory bodies.

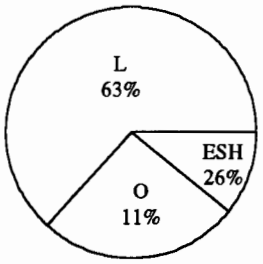
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Corrective Activities/Waste Management	147,653	212,520	225,141	243,200	266,696	292,541	298,819
Environmental Restoration	62,369	89,718	87,984	94,271	105,264	112,214	123,435
Facility Transition	0	300	0	0	0	0	0
Total	210,022	302,538	313,125	337,471	371,960	404,755	422,254

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites. ICPP funding estimates are not included.

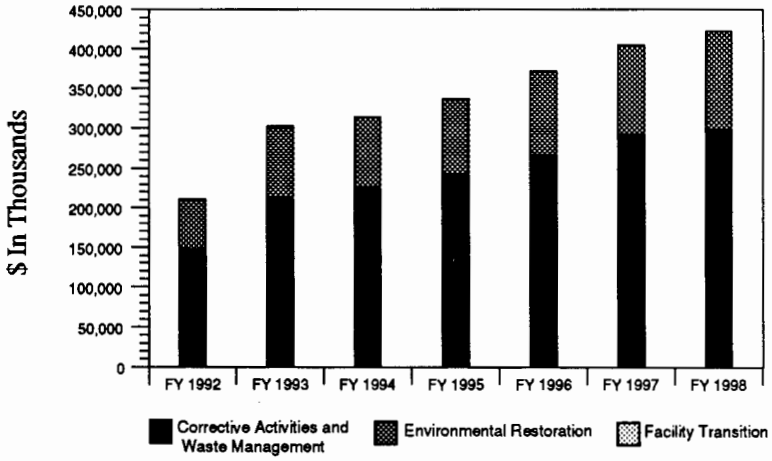
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



L- Legally Driven Requirements
ESH- Environment, Safety, and Health Requirements
O- Other Desirable Activities

Estimates by Year



For further information regarding Idaho National Engineering Laboratory, call (208) 526-1317.

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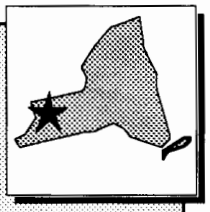
IDAHO FIELD OFFICE
INSTALLATION SUMMARY
WEST VALLEY DEMONSTRATION PROJECT OFFICE



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 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. 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.

STRATEGIC OUTLOOK

WVDP is responsible for demonstrating that solidification is a viable way to prepare HLW for disposal. Construction of the Vitrification Facility, which is the solidification process/facility approved by DOE, is continuing on schedule. In preparation for the solidification of HLW, the WVDP is continuing to process the HLW liquid into a nonhazardous low-level waste (LLW). This process has undergone DOE and Nuclear Regulatory Commission (NRC) review. The LLW volume will continue to be reduced by processing sludge wash liquid through the Integrated Radwaste Treatment System (IRTS). Environmental documentation will continue to be provided, and environmental effluent monitoring will continue. The Environmental Safety and Health Program will continue to respond to regulations for hazardous and mixed waste disposal, industrial safety, and radiological safety. The Federal and State Facility Compliance Agreement (FSFCA) is expected to be approved by the end of FY 1992. A definitive schedule and cost estimate for completion of the WVDP (post-HLW solidification) will be prepared upon determination of a preferred alternative in the Phase II Environmental Impact Statement (EIS) Record of Decision.

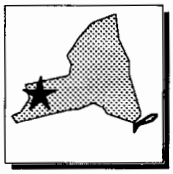
Regulatory Drivers

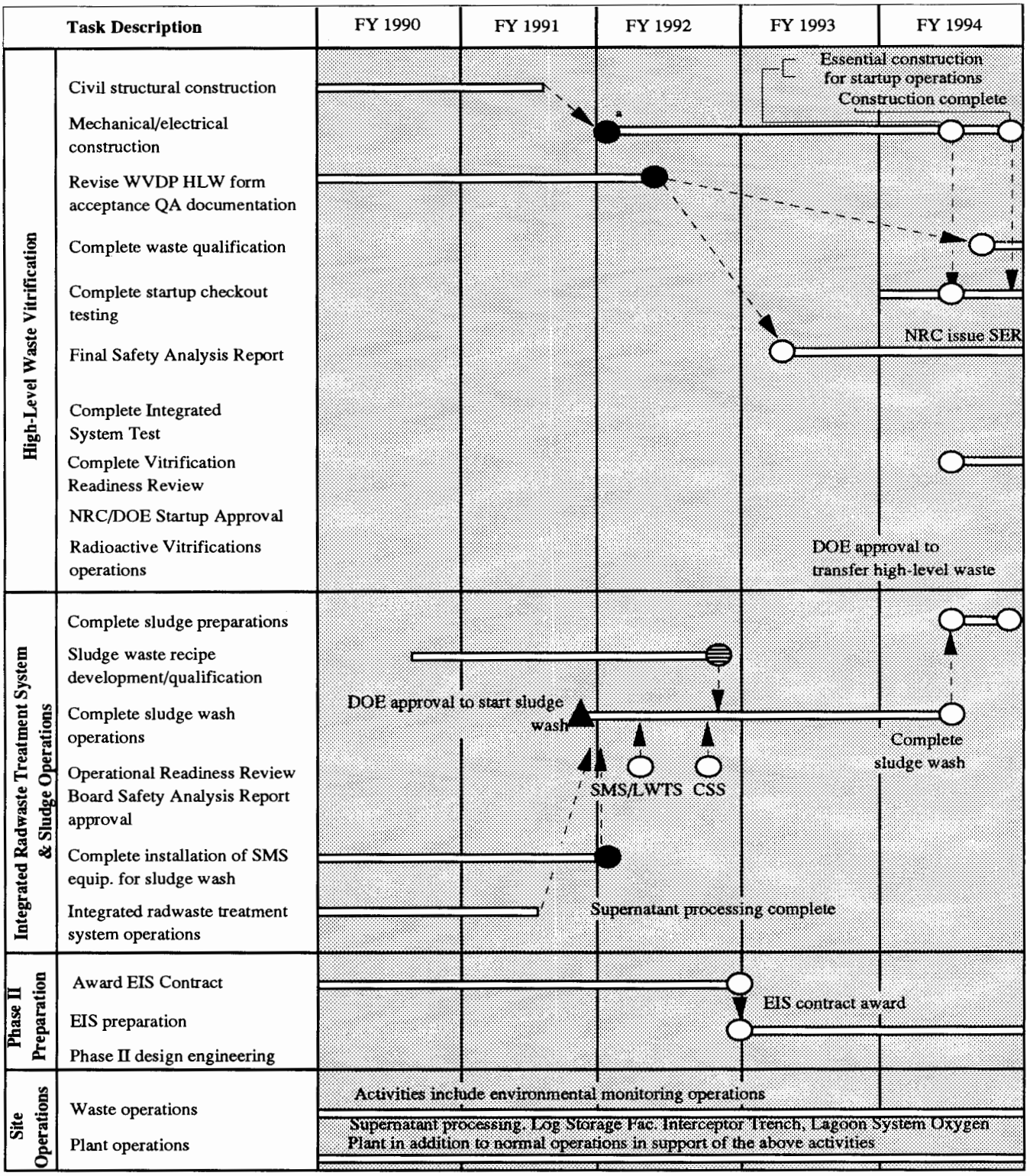
- Public Law 96-368.
- Memorandum of Understanding between DOE and NRC.
- Cooperative agreement between DOE, EPA, and New York State Department of Environmental Conservation (NYSDEC).
- Stipulation of Compromise Settlement (May 1987) between DOE (defendant) and the Coalition on West Valley Nuclear Waste (plantiffs), which directs DOE to include LLW and TRU waste disposition in a planned EIS for Phase II operation and project closure.
- RCRA 3008(h) Administrative Order on Consent, approved in March 1992 by DOE, New York State Research and Development Authority, NYSDEC and EPA.
- National Environmental Policy Act (NEPA).

ACCOMPLISHMENTS (FY 1991 - 3Q FY 1992)

- Placed Final Vitrification Mechanical/Electrical contact package five months ahead of schedule.
- Provided DOE Headquarters with Field Office closeout of all Tiger Team action items.
- Solidified and placed in long-term on-site storage LLW produced during the concentration of the HLW activity.
- Continued the expanded environmental monitoring program, providing data to achieve full compliance with DOE Order 5400.1 and to support Phase II EIS activities.
- Completed processing of supernatant liquid from HLW tank 8D-2 through the IRTS ahead of schedule in 2Q FY 1991. Sludge wash operations were initiated in October 1991. Processing of sludge wash liquid through the IRTS was initiated in April 1992.
- Submitted WVDP RCRA Part A Permit Application for mixed waste.
- RCRA 3008(h) Administrative Order of Consent was approved in March 1992.
- WVDP maintained safe and environmentally sound site operations.
- Development of a qualified Quality Assurance Program is proceeding.

IDAHO FIELD OFFICE
PROGRESS CHART
WEST VALLEY DEMONSTRATION PROJECT OFFICE





MAJOR MILESTONES	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
• Negotiate Federal/State Facilities Compliance Agreement.	4Q FY 1991	4Q FY 1992[1]	RCRA[2]
• Provide Waste Qualification Review Package #4 to EM-343.	New	1Q FY 1993	RCRA
• Award EIS Contract (Phase II).	New	1Q FY 1993	NEPA
• Provide Waste Qualification Review Package #5 to EM-343.	New	2Q FY 1993	RCRA
• Provide Volume III (Part C), Vitrification Hot Operations (SAR-003), to EM-343.	New	3Q FY 1993	RCRA
• Issue Operational Readiness Review Board Checklist for Vitrification Facility Startup.	4Q FY 1993	4Q FY 1993	RCRA
• Provide Waste Qualification Report Package #6 to EM-343.	New	2Q FY 1994	RCRA
• NRC issue Vitrification Radioactive Operations SER.	New	3Q FY 1994	RCRA
• Complete sludge preparations.	New	4Q FY 1994	RCRA
• Complete vitrification facility construction.	4Q FY 1994	4Q FY 1994	RCRA
• Publish Final Phase II EIS.	2Q FY 1995	2Q FY 1995	NEPA
• Complete vitrification startup/checkout testing.	New	4Q FY 1995	RCRA
• Approve start of integrated system testing.	New	4Q FY 1995	RCRA
• Commence integrated nonradioactive vitrification operations.	New	1Q FY 1996	RCRA
• Complete integrated system testing.	New	1Q FY 1996	RCRA
• Publish Phase II ROD.	1Q FY 1996	1Q FY 1996	NEPA
• Begin radioactive vitrification system operations.	2Q FY 1996	2Q FY 1996	RCRA
• Completed Vitrification System Radioactive Operations Phase I.	4Q FY 1998	3Q FY 1998[3]	RCRA
• Return site to New York State.		TBD	PL 96-368

NEPA - National Environmental Policy Act

[1]Negotiations have been extended.
[2]Including 3000(h) Administrative Order on Consent and Interim Status Standards (Applies to all RCRA regulatory drivers).
[3]Completion advance because of reallocation of funds.

WEST VALLEY DEMONSTRATION PROJECT OFFICE

Long-Term Objectives

Decontamination and Decommissioning of the facility, FY 2023.

Turnover of the facility to New York State for site closure, FY 2024.

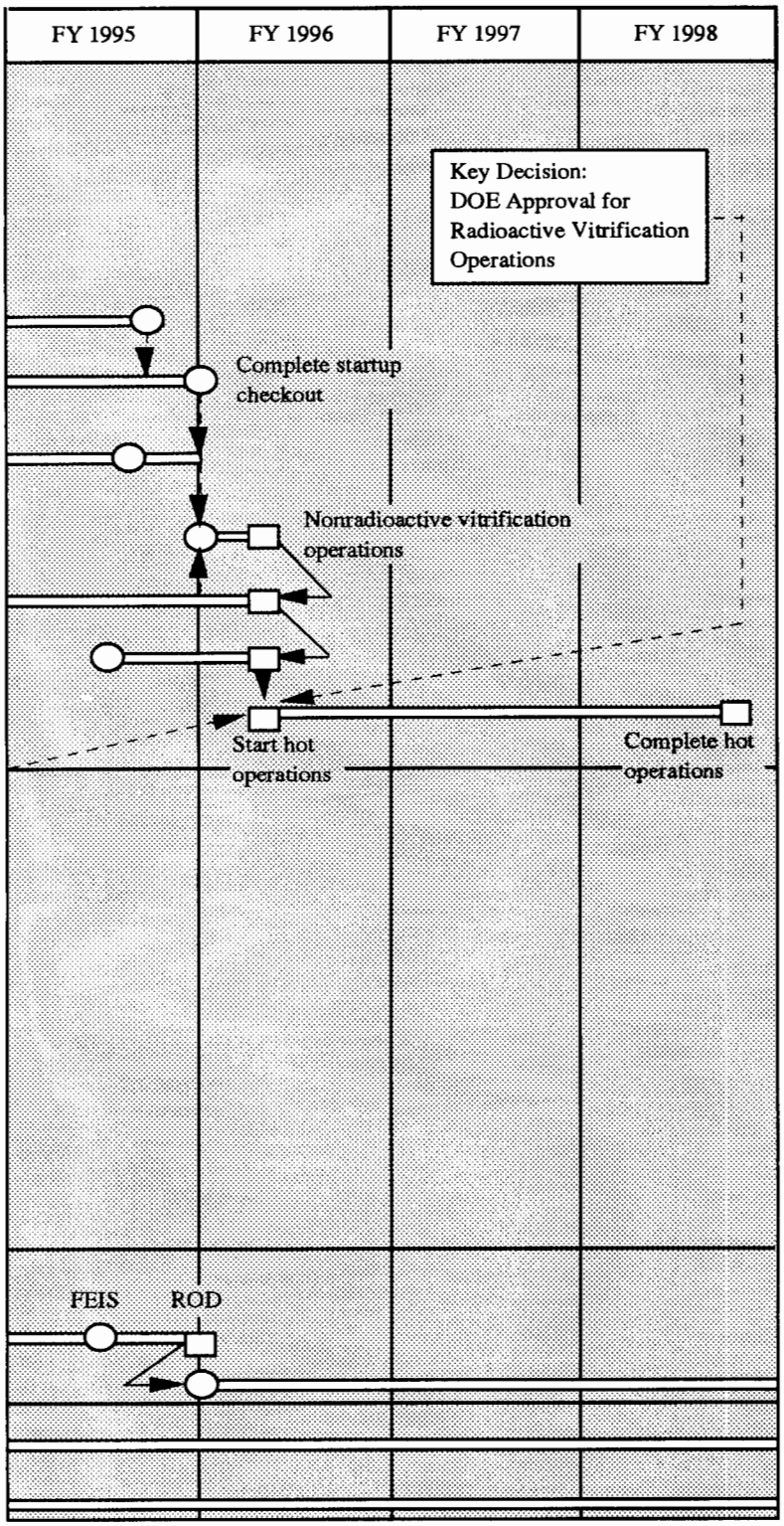
Five-Year Objectives

Publish Phase II FY 03/31/95.

Record of decision forecasted complete 10/01/95.

Start vitrification radioactive operations 01/01/96.

Complete vitrification radioactive operations 06/30/98.



Milestone Types

- Unchanged from FY 1993-1997 FYP
- New since FY 1993-1997 FYP
- Changed from FY 1993-1997 FYP

Milestone Status

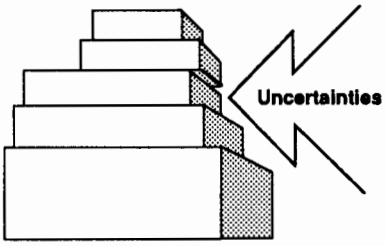
- Planned
- Complete
- 50 percent complete
- Information flow

Notes and Acronyms

CSS	– Cement Solidification System
EIS	– Environmental Input Statement
FEIS	– Final Environmental Impact Statement
FYP	– Five-Year Plan
HLW	– High-Level Waste
LWTS	– Liquid Waste Treatment System
NRC	– Nuclear Regulatory Commission
QA	– Quality Assurance
ROD	– Final Safety Analysis Report
SER	– Safety Evaluation Report
SMS	– Sludge Mobilization System
WVDP	– West Valley Demonstration Project

[a] The Vitrification Mechanical/ Electrical Contract was awarded five months ahead of schedule.

FIVE-YEAR PLAN ESTIMATES



There are a number of potential activities at the West Valley Demonstration Project (WVDP) that may affect program requirements. These potential activities have not been included in the estimates below due to various uncertainties regarding scope of work, the phasing of regulatory reviews and approval schedules, availability of technology, lack of independent cost reviews and other factors. Uncertainties at WVDP are in part due to additional safety and health requirements and Idaho National Engineering Laboratorywide coordination requirements. If further analysis of these uncertainties and potential additional work results in additional funding needs based on legal requirements, DOE will, through mechanisms such as reallocating budgetary resources, requesting funds through the normal appropriation process, supplemental requests or internal reprogramming, pursue funding for these activities, or where appropriate, based on technical reasons, enter into the formal conflict resolution process with regulatory bodies.

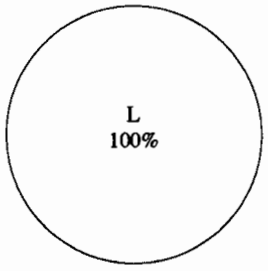
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Corrective Activities/Waste Management	104,000	134,000	126,000	134,000	134,000	134,000	134,000
Total	104,000	134,000	126,000	134,000	134,000	134,000	134,000

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites.

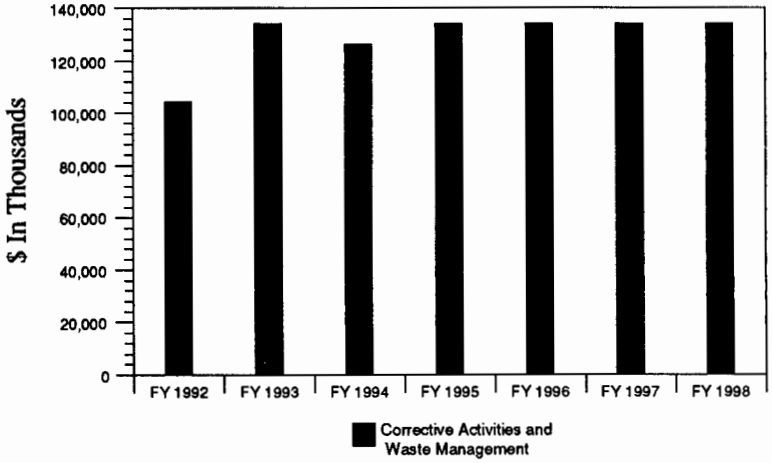
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



L- Legally Driven Requirements

Estimates by Year



For further information regarding West Valley Demonstration Project, call (208) 526-1317.

NEVADA FIELD OFFICE
INSTALLATION SUMMARY
NEVADA OFF-SITE LOCATIONS

DESCRIPTION

Nevada Field Office (NV) manages eight off-site [i.e., other than Nevada Test Site (NTS)] locations that were used for underground nuclear explosive tests and experiments from 1961 through 1973. The purposes of the tests were to study the peaceful uses of nuclear explosions (the Plowshare Program) and perform studies related to underground seismic effects and warhead development. These sites are located at Amchitka Island, Alaska; the Rio Blanco and Rulison test locations near Rifle, Colorado; the Gasbuggy and Gnome-Coach gas stimulation test sites near Farmington and Carlsbad, New Mexico respectively; the Tatum Dome Site near Hattiesburg, Mississippi; the Project Shoal Site near Fallon, Nevada; and the Central Nevada Test Site near Tonopah, Nevada. Pending further clarification through discussions with the five host states, NV considers CERCLA to be the primary regulatory authority governing remediation of the sites.

STRATEGIC OUTLOOK

NV's goals are to achieve full compliance with all environmental laws and regulations related to off-site locations. NV plans to complete the remediation of all NTS off-site locations by the end of FY 2004. The Tatum Dome site in Mississippi has a scheduled completion date in FY 1998. Remediation of sites in the other host states is scheduled beyond the five-year planning period: 2001 in Alaska, 2002 for the two sites in Colorado, 2003 for the two New Mexico sites, and 2004 for the two off-site test locations in Nevada.

Under its Environmental Restoration Program, NV will characterize contaminant sources and contamination at each of the off-site test locations, determine the risk associated with that contamination, and implement remedial actions to protect or restore natural resources. NV will conduct all site characterizations and remediation in strict accordance with applicable environmental laws and regulations at both the Federal and State levels. The site characterization and remediation activities are expected to result in moderate volumes of residual wastes (e.g., well cuttings, sample purge water, decontaminated fluids, and bulk soils). Pending the completion of feasibility studies for each of the sites, the nature of the wastes and locations for their disposal have not yet been determined.

With the preparation of a draft Remedial Investigation/Feasibility Study (RI/FS) Work Plan for the Tatum Dome Site in Mississippi, NV has initiated its CERCLA characterizations at the off-site locations. This work plan has been reviewed by the State regulatory authority and is currently being revised. The work planned under this activity represents the first CERCLA RI/FS investigation of an underground nuclear test site. Information gained during this investigation will be used by NV in the design and implementation of similar efforts in the other host states as well as at NTS locations.

As for long-term land use planning at the off-site locations, NV assumes that all sites will be released to unrestricted surficial use but that subsurface rights will be restricted. Such restrictions will be designed to ensure that intrusion into the contaminated underground test points does not occur. For example, at the Tatum Dome

STRATEGIC OUTLOOK (Continued)

Site in Mississippi, subsurface exploration is prohibited for minerals, gas, or oil, but the surface of the site is privately owned and is actively used for timber production and hunting. Sites in Alaska, Colorado, New Mexico, and Nevada will be returned to the public domain with similar restrictions.

ACCOMPLISHMENTS (FY 1991 – 3Q FY 1992)

- Performed CERCLA Preliminary Assessments for the inactive sites.
- Signed Agreement-in-Principle with the State of Mississippi.
- Submitted first and second draft Tatum Dome Site RI/FS Work Plans to the Mississippi regulatory authority.
- Further developed program plans through the breakdown of individual assessment, oversight, and Federal compliance in each of the five host States.
- Developed the performance baseline for the Tatum Dome Site in Mississippi.
- Developed forecast baselines for test sites in Alaska, Colorado, Nevada, and New Mexico.
- Initiated a health effects study near the Tatum Dome Site.

MAJOR MILESTONES

Environmental Restoration	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
• Complete Tatum Dome Site Assessment.	1Q FY 1994	3Q FY 1995[1]	CERCLA
• Complete Rulison Site Assessment.	1Q FY 1995	3Q FY 1997[2]	CERCLA
• Complete Gnome-Coach Site Assessment.	1Q FY 1995	4Q FY 1997[2]	CERCLA
• Complete Tatum Dome Site Remediation.	1Q FY 1996	3Q FY 1998[1]	CERCLA
• Complete Central Nevada Test Site Assessment.	4Q FY 1996	2Q FY 1998[2]	CERCLA
• Complete Amchitka Island Site Assessment.	1Q FY 1995	2Q FY 1998[2]	CERCLA

[1]Slipped because of time required for State review and approval of work plan.
[2]Slipped because of planning schedule adjustments in NV's Environmental Restoration Program during the development of baseline technical scopes and budgets.

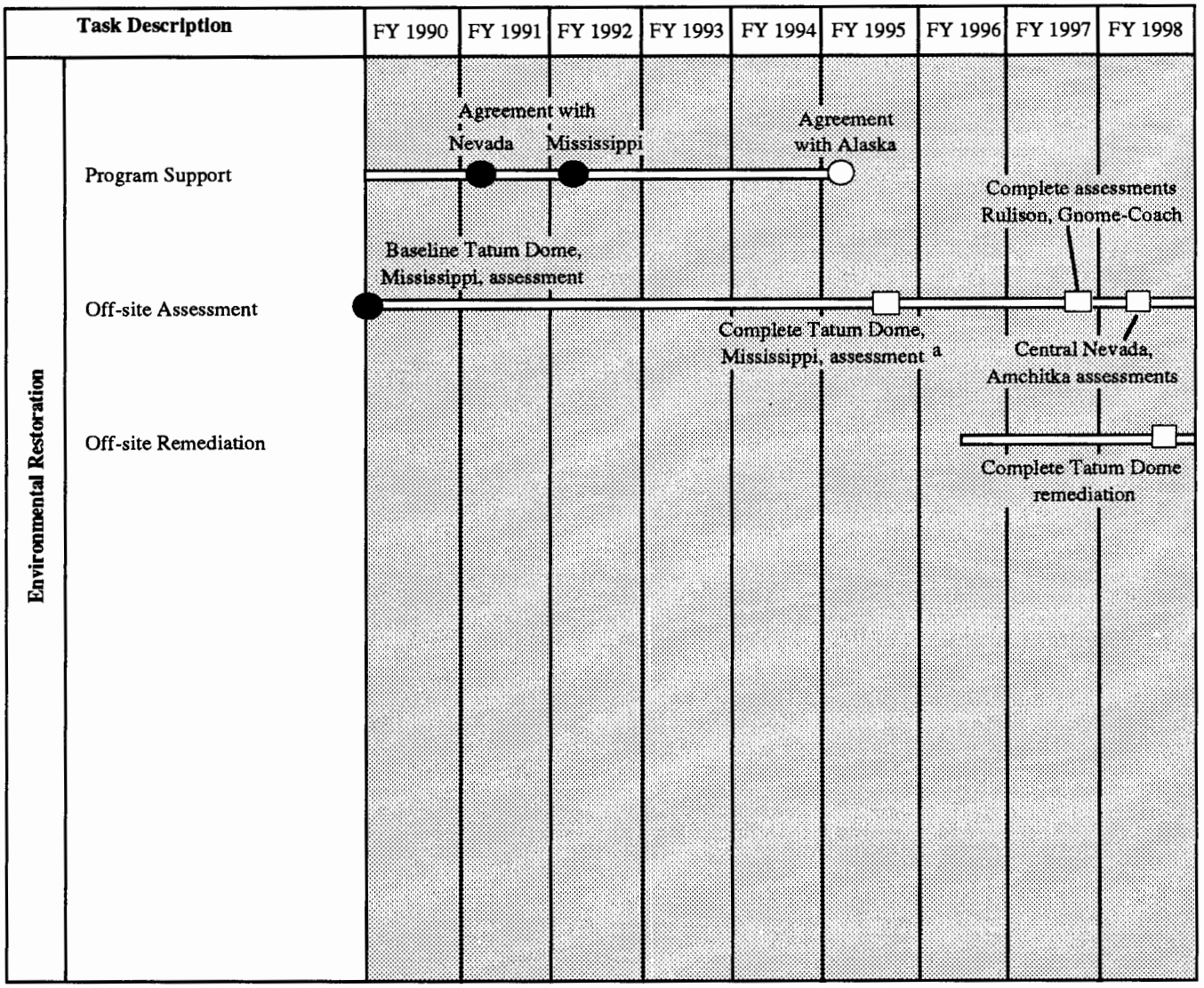
NEVADA FIELD OFFICE
PROGRESS CHART
NEVADA OFF-SITE LOCATIONS

Long-Term Objectives

Enter into agreements with each host state by FY 1994.
Clean up all off-site locations by FY 2004.

Five-Year Objectives

Complete program planning by FY 1994.
Complete Tatum Dome, Mississippi, assessment by FY 1996.
Complete Rulison, Colorado, assessment by FY 1997.
Complete Gnome-Coach, New Mexico, assessment by FY 1997.
Complete Amchitka Island, Alaska, assessment by FY 1998.
Complete Central Nevada Test Site assessment by FY 1998.



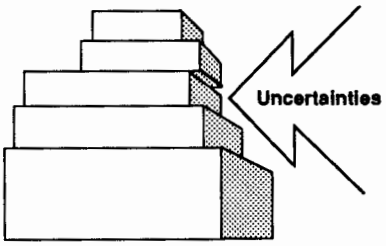
Milestone Types	Milestone Status
○ Unchanged from FY 1993–1997 FYP	○ ◇ □ Planned
◇ New since FY 1993–1997 FYP	● ◆ ■ Complete
□ Changed from FY 1993–1997 FYP	50 percent complete
	– – – → Information flow

Notes and Acronyms

[a] Delayed pending review and approval of work plan.

FYP- Five-Year Plan

FIVE-YEAR PLAN ESTIMATES



There are a number of potential activities at the Nevada Off-Site Locations that may affect program requirements. These potential activities have not been included in the estimates below due to various uncertainties regarding scope of work, the phasing of regulatory reviews and approval schedules, availability of technology, pending completion of independent cost reviews and other factors. Uncertainties in part at the Nevada Off-Site Locations include requirements for long term environmental monitoring at the eight off-site locations and results of environmental assessments at these locations. If further analysis of these uncertainties and potential additional work results in additional funding needs based on legal requirements, DOE will, through mechanisms such as reallocating budgetary resources, requesting funds through the normal appropriation process, supplemental requests or internal reprogramming, pursue funding for these activities, or where appropriate, based on technical reasons, enter into the formal conflict resolution process with regulatory bodies.

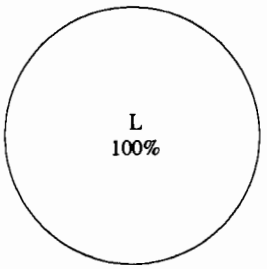
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Environmental Restoration	695	2,122	3,158	2,698	250	245	997
Total	695	2,122	3,158	2,698	250	245	997

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites.

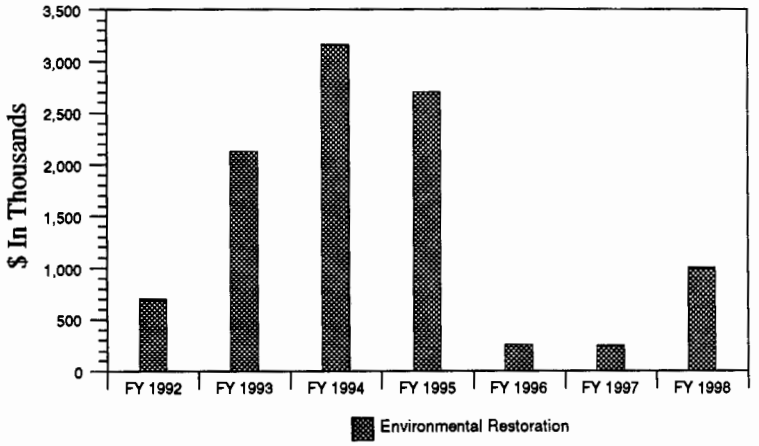
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



L- Legally Driven Requirements

Estimates by Year



For further information regarding Nevada Off-Site Locations, call (702) 295-3521.

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NEVADA FIELD OFFICE
INSTALLATION SUMMARY
NEVADA TEST SITE

DESCRIPTION

Nevada Field Office (NV) operates the Nevada Test Site (NTS) and is responsible for nuclear explosives test areas on the Tonopah Test Range (TTR) and Nellis Air Force Range, collocated in south-central Nevada; where the NTS covers approximately 1350 square miles of desert and mountainous terrain. The closest major population center is Las Vegas, about 65 miles southeast of NTS. The primary use of NTS has been for underground nuclear weapons tests and, historically, aboveground nuclear tests. Approximately 1100 surface and subsurface contamination sites from nuclear tests and ancillary operations have been identified. These include waste disposal sites associated with testing activities and areas where surficial soils were contaminated with plutonium as a result of destructive safety tests of nuclear devices. Pending further clarification by EPA, NV considers CERCLA to be the primary regulatory authority governing remediation of most sites. For currently active tunnel drainage collection ponds and muckpiles that receive waste rock generated during tunneling operations, RCRA may be the primary regulatory authority.

STRATEGIC OUTLOOK

NV's primary goals are to achieve full compliance with all environmental laws and regulations and to control further releases of contaminants to the environment from NTS operations. An additional goal is to attain, within 30 years, an acceptable cleanup of hazardous substances, pollutants, and contaminants, which, at a minimum, will ensure protection of human health and the environment. To achieve these goals, NV will bring all current operations into full compliance with applicable regulatory requirements, assess and clean up inactive waste sites and facilities, continue safe and effective waste management operations emphasizing systematic minimization of waste generation, and coordinate a research and development program to develop new technologies that yield permanent remedial actions at lower costs.

EPA and the State of Nevada will be involved via an Interagency Agreement (IAG) with DOE. NV has already increased its emphasis on public participation through the development and implementation of a Community Relations Plan.

NV waste management activities entail the treatment, storage and/or disposal of radioactive, hazardous, and mixed wastes. The goals of this program include protection of workers, the public, and the environment; compliance with all applicable Federal, State, and DOE requirements; minimization of the volume of wastes generated; and provision for future waste disposal needs through the identification, evaluation, permitting, and construction of additional waste management units at NTS. DOE is currently considering executing a site-wide EM Environmental Impact Statement for environmental restoration and waste management activities. NV will continue to operate shallow land burial facilities at NTS for the safe long-term disposal of low-level radioactive wastes generated at other facilities in the DOE complex. Low-level waste (LLW) is currently being received from six waste generators (Fernald, Inhalation Toxicology Research Institute, Aberdeen, Pantex, Mound and Rocky Flats Buildings 555 and 528). Upon approval, six more DOE facilities will resume the shipment of wastes to NTS for disposal. Plans also call for acceptance of mixed wastes after appropriate environmental documents and permits have been obtained.

STRATEGIC OUTLOOK (Continued)

In the past, NTS has been called on to dispose of limited amounts of DOE high-activity and special case wastes in Greater Confinement Disposal. To retain this capability an EIS evaluation and environmental analysis of Greater Confinement Disposal methodologies for possible use at NTS is planned. NTS is currently moving toward closure of existing Greater Confinement bore holes.

Under the Environmental Restoration Program, NV will characterize contaminant sources and contamination at NTS, determine the risk associated with that contamination, and implement remedial actions to protect or restore natural resources damaged by past releases of hazardous substances at NTS. NV plans to conduct all site characterizations and remediation in strict accordance with the environmental laws and regulations at both the Federal and State levels.

To support both waste management and environmental restoration activities, NV has committed significant resources to an aggressive Technology Development Program. The goals of this research effort include development and demonstration of a cleanup system for large areas of soils contaminated with plutonium, development of remote sensing techniques for efficient and cost-effective characterization of large sites such as NTS, and development of population dose models and risk assessments related to different technological approaches to plutonium-contaminated soil cleanup.

ACCOMPLISHMENTS (FY 1991 – 3Q FY 1992)

Corrective Activities

- Fenced and marked all active sanitary landfills.
- Completed all but one sewage system modifications to control unpermitted discharges.
- Surveyed 30% of 600 NTS building water systems which may require backflow prevention devices to ensure protection of potable water.
- Completed environmental protection and pollution prevention plans.
- Completed a calibration study of NTS nonradiological air quality.

Waste Management

- Executed a Settlement Agreement with the State of Nevada for mixed transuranic waste storage.
- Completed engineering plans and conceptual design reports for the Minimum Technology Facility, an engineered disposal facility for mixed waste that provides pit liners, groundwater monitoring wells and a leachate collection system to ensure groundwater protection.
- Resolved permitting issues concerning satellite accumulation points for RCRA-generated wastes.
- Completed Draft Radiological Performance Assessments for Areas 3 and 5 waste management sites.
- Completed waste generator audits for Fernald, Inhalation Toxicology Research Institute, Rocky Flats, Aberdeen, and Pantex. Four of these sites were approved for LLW disposal at NTS.
- Completed overpacking of all transuranic waste containers, constructed a security fence, and completed the planning and design documents for an all-weather cover for the TRU waste pad in Area 5.
- Disposed of 340,000 cubic feet of LLW generated off-site in FY 1991.

ACCOMPLISHMENTS (Continued)

Environmental Restoration

- Performed CERCLA Preliminary Assessments for the inactive sites.
- Prepared draft RCRA Closure Plans for inactive sites.
- Submitted a draft Hazard Ranking System rescoring of NTS to EPA.
- Prepared National Environmental Policy Act (NEPA) documentation for the Groundwater Characterization Project.
- Initiated RCRA assessments of active tunnel ponds and muckpiles.
- Conducted public participation meetings and presentations.
- Completed a comprehensive inventory of abandoned waste disposal sites and release sites on NTS.
- Completed installation of the first NTS groundwater characterization well.

Technology Development

- Initiated collection of plutonium-contaminated soil samples for the soil cleanup integrated demonstration project.
- Established a soil Treatability Test Facility at NTS.
- Conducted remote sensing technology reviews for applicable sensor systems.
- Initiated data collection for the development of site-specific pathway/dose computational models for different plutonium-contaminated soil cleanup approaches.

NEVADA FIELD OFFICE PROGRESS CHART NEVADA TEST SITE

	Task Description	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994
Corrective Activities and Waste Management	Water Projects (Potable Water Protection)			Complete training for inspectors		
	Air Projects	Pollution Awareness Plan		Environmental Monitoring Plan	Complete environmental data base management system	
	Solid Waste Projects	Complete fencing landfills		Complete septic field inspection	Complete wastewater lagoons[b]	Complete septic tank closure
	Required Documentation			Complete characterization boreholes[c]		Receive RCRA Permit
	Waste Minimization	Complete Waste Minimization Plan		Install oil/water separators and compactors		
	Treatment/ Storage			Begin liquid waste pond construction		Complete liquid waste pond construction
	Defense Waste Disposal (ongoing activity)	Four generators approved for disposal		Six generators approved for disposal	Construct RCRA storage facility	Close disposal unit U3axbl; 19 generators approved for disposal
Environmental Restoration	Program Support			SARA Sect.120 Agreement signed[e]		
	On-site Assessment			Complete tunnel pond assessment[f]		
	On-site Remediation		Begin D&D facility surveillance		New soil cleanup technology	
	D&D of NV Facilities					Complete surveillance
Technology Development	Plutonium-Contaminated Soil Cleanup Methods				Complete soil/ vegetation removal demonstration	
	Advanced Technology Demonstrations	Begin technology demonstrations				Complete waste package imaging demonstration
	NTS Radiological Dose Assessment			Begin data accumulation		Complete pathway/ risk analysis

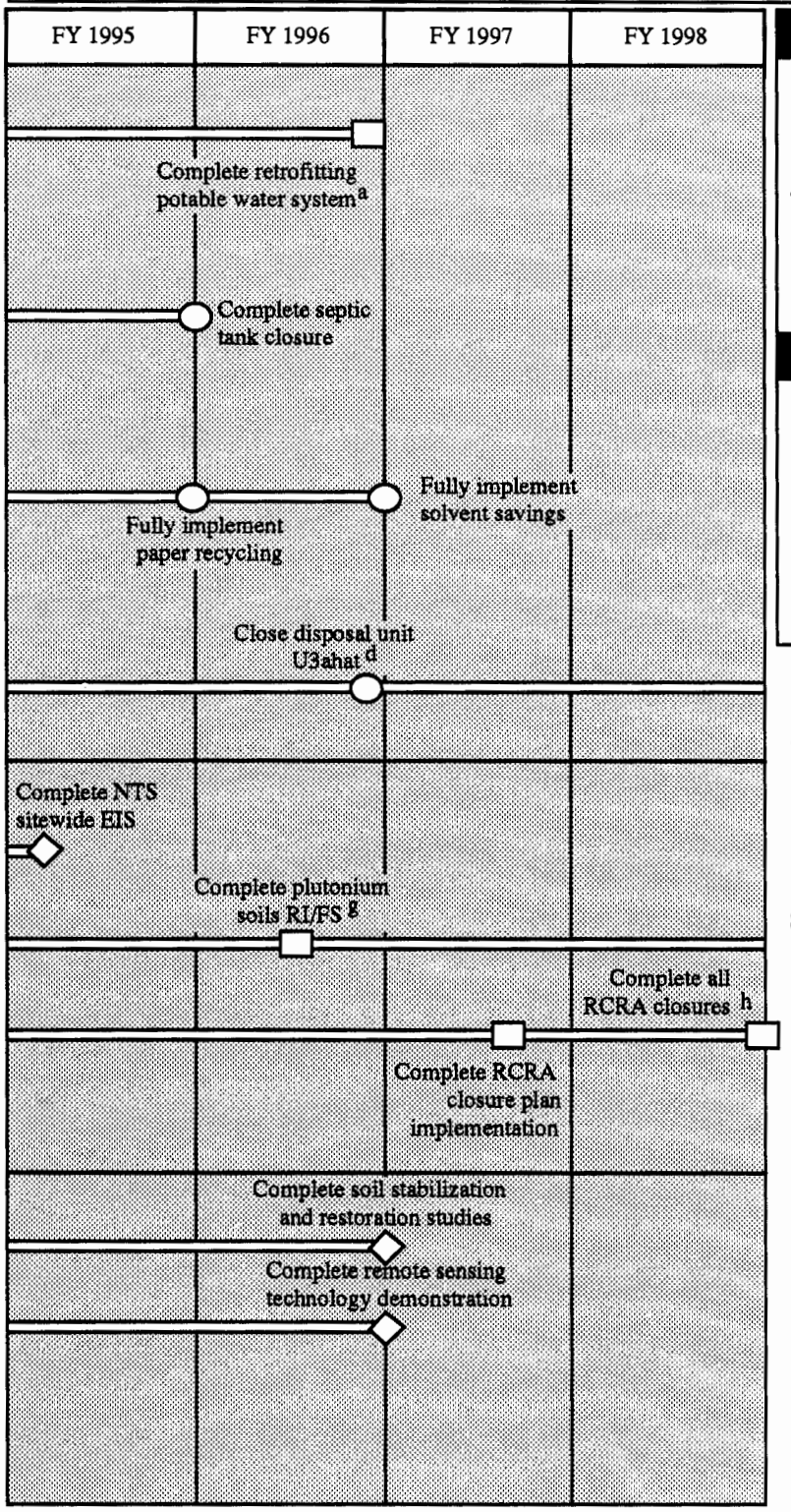
NEVADA TEST SITE

Long-Term Objectives

Clean up all WAGs by FY 2007.
Decommission surplus facilities by FY 1998.
Have disposal process in place for minimized waste streams by FY 1998.
Complete remediation of all plutonium-contaminated soil sites by FY 2004.
Complete all nuclear test area RI/FS by FY 2003.

Five-Year Objectives

Complete implementation of Waste Minimization Program.
Permit and construct waste treatment, storage, and disposal sites to handle waste stream.
Complete all Corrective Activities by FY 1997.



Milestone Types

- Unchanged from FY 1993–1997 FYP
- New since FY 1993–1997 FYP
- Changed from FY 1993–1997 FYP

Milestone Status

- Planned
- Complete
- 50 percent complete
- Information flow

Notes and Acronyms

D&D - decontamination and decommissioning
EIS - Environmental Impact Statement
FYP - Five-Year Plan
NV - Nevada Field Office
RI/FS - Remedial Investigation/Feasibility Study
SARA - Superfund Amendments and Reauthorization Act

[a] Slipped because of unanticipated scope and complexity of retrofit.
[b] Slipped because of reengineering to include influent pretreatment and site relocation.
[c] Delayed pending approval of NEPA documentation and procurement of drilling services.
[d] Delayed due to continued disposal capacity.
[e] Delayed pending decision by EPA to list the NTS as a candidate for the National Priorities List.
[f] Delayed due to extended time required to procure and debug equipment.
[g] Delayed because of increased scope of work to include all contaminated soils on the NTS.
[h] Slipped because of delays in approval of closure plans.

MAJOR MILESTONES

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
Corrective Activities			
• Complete construction of lined pond, Area 6 decontamination facility.	2Q FY 1992	3Q FY 1993[1]	NRS 445.178 NRS 445.221
• Implement Environmental Data Base Management Information System.	4Q FY 1992	4Q FY 1992	DOE Order 5400.1
• Complete environmental upgrades of all landfills.	4Q FY 1992	4Q FY 1992	NAC 444.684
Waste Management			
• Complete construction of steam-cleaning effluent discharge pads (Area 12).	4Q FY 1991	2Q FY 1993[2]	RCRA 40 CFR 122, 264, 267, 268 NRS 445.119
• Open New Area 3 Subsidence Crater for LLW disposal.	2Q FY 1992	2Q FY 1998[3]	DOE Order 5820.2A
• Receive RCRA Mixed Waste Permit from the State of Nevada.	4Q FY 1992	4Q FY 1993[4]	RCRA 40 CFR 260-268
• Initiate characterization/certification of Lawrence Livermore National Laboratory Waste Packages.	1Q FY 1993	1Q FY 1993	DOE Order 5820.2A
• Close Area 5 Pit 4 (classified waste).	1Q FY 1993	1Q FY 1993	DOE Order 5820.2A
• Open New Area 5 LLW Pit.	1Q FY 1993	1Q FY 1993	DOE Order 5820.2A
• Complete performance assessment for Greater Confinement Disposal Facility.	FY 1993–1994	FY 1993–1994	40 CFR 191
• Close U3axbl bulk LLW disposal pit.	4Q FY 1994	4Q FY 1994	DOE Order 5820.2A
• Complete environmental analysis for Greater Confinement Disposal EIS.	4Q FY 1995	4Q FY 1995	40 CFR 1510
• Closure of U3ahat disposal pit.	4Q FY 1996	4Q FY 1996	DOE Oder 5820.2A

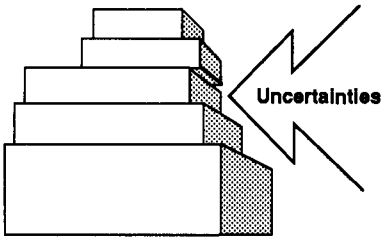
MAJOR MILESTONES (Continued)

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
Environmental Restoration			
• Negotiate SARA Section 120 agreement with the State of Nevada and EPA.	2Q FY 1992	2Q FY 1993[5]	CERCLA SARA Sect. 120
• Complete active tunnel pond assessment and closure plans.	4Q FY 1992	4Q FY 1992	RCRA 40 CFR 261-268
• Complete development of RCRA closure plans for incidental waste sites.	3Q FY 1994	4Q FY 1995[6]	RCRA 40 CFR 261-268
• Complete surveillance of NTS facilities scheduled for decontamination and decommissioning.	4Q FY 1993	4Q FY 1993	DOE Order 5820.2A
• Complete RCRA closure plan implementation for incidental waste sites.	4Q FY 1994	3Q FY 1997[7]	RCRA 40 CFR 261-268
• Complete installation of 66 groundwater characterization wells.	4Q FY 1994	4Q FY 1998[8]	RCRA 40 CFR 261-268
• Conduct investigations of abandoned septic tanks.	4Q FY 1994	4Q FY 1994	RCRA 3004(u)
Technology Development			
• Complete plutonium pathway/risk analysis, Area 11.	New	4Q FY 1993	DOE Management Initiative
• Implement radiological analysis quality assurance system.	New	2Q FY 1995	DOE Management Initiative

[1]Slipped because of reengineering to include influent pretreatment and site relocation. (Consolidated with former waste management milestones for new ponds.)
[2]Newly identified State discharge requirement requires extensive reengineering.
[3]Delayed because the projected date that existing pit will be filled has slipped.
[4]Slipped because of State requirement for corrective actions.
[5]Slipped pending EPA review and revisions to draft Hazard Ranking System scoring of NTS.
[6]Slipped because of length of time required for closure plan reviews.
[7]Slipped because of delays in approval of closure plans.
[8]Schedule slipped to reflect higher well drilling costs.

CFR - *Code of Federal Regulations*
NAC - Nevada Administrative Code
NEPA - National Environmental Policy Act
NRS - Nevada Revised Statute
SARA - Superfund Amendments and Reauthorization Act

FIVE-YEAR PLAN ESTIMATES



There are a number of potential activities at the Nevada Test Site (NTS) that may affect program requirements. These potential activities have not been included in the estimates below due to various uncertainties regarding scope of work, the phasing of regulatory reviews and approval schedules, availability of remedial technology, completion of independent cost reviews and other factors. Uncertainties at NTS are due in part to additional program management support for decontamination and decommissioning activities, groundwater characterization studies and RI/FS activities at CERCLA Industrial Sites. If further analysis of these uncertainties and potential additional work results in additional funding needs based on legal requirements, DOE will, through mechanisms such as reallocating budgetary resources, requesting funds through the normal appropriation process, supplemental requests or internal reprogramming, pursue funding for these activities, or where appropriate, based on technical reasons, enter into the formal conflict resolution process with regulatory bodies.

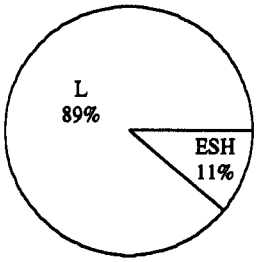
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Corrective Activities/Waste Management	16,305	21,457	23,188	25,048	27,468	30,130	30,776
Environmental Restoration	23,954	33,055	35,570	39,903	46,611	51,302	55,704
Total	40,259	54,512	58,758	64,951	74,079	81,432	86,480

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites.

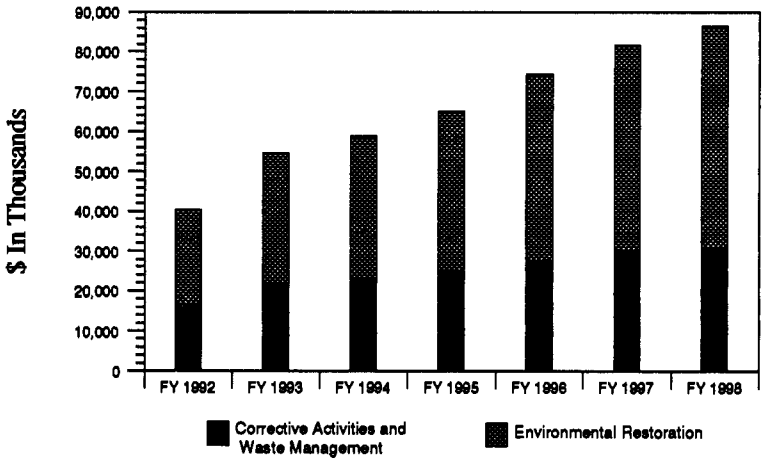
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



L- Legally Driven Requirements
ESH- Environment, Safety, and Health Requirements

Estimates by Year



For further information regarding Nevada Test Site, call (702) 295-3521.

OAK RIDGE FIELD OFFICE
INSTALLATION SUMMARY
FORMERLY UTILIZED SITES REMEDIAL ACTION PROGRAM

DESCRIPTION

The Formerly Utilized Sites Remedial Action Program (FUSRAP) currently includes 33 sites in 13 States. FUSRAP was initiated in 1974 to identify, clean up, or otherwise control sites where radioactive contamination remains from the early years of the Nation's atomic energy program or from commercial operations that Congress authorized DOE to remedy. Of the 33 FUSRAP sites, 28 are Manhattan Engineer District or Atomic Energy Commission 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 sites are listed on the EPA's National Priorities List.

STRATEGIC OUTLOOK

The objectives of FUSRAP are to

- identify and assess all sites formerly used to support early Manhattan Engineer District/Atomic Energy Commission (MED/AEC) nuclear work to determine whether further decontamination and/or control is needed,
- decontaminate and/or apply controls to FUSRAP sites to permit conformance with current applicable guidelines,
- dispose of and/or stabilize all generated residues in a radiologically and environmentally acceptable manner, and
- certify that remedial action is complete and the site is available for appropriate future use.

Within the 30-year planning window, the Remedial Investigation/Feasibility Study (RI/FS) process will identify options, and permanent remedial actions will be taken on approximately two million cubic yards of contaminated material from FUSRAP sites. Permanent disposal options must be identified or developed for this low-level radioactive and mixed waste to support significant cleanup plans. While feasibility studies will evaluate many cleanup options, for planning purposes, present cleanup strategies are based on the use of known effective remedial action methods (i.e., contaminated soil will be excavated and disposed of or stored in an appropriate facility).

While concurrent activities will occur at all states to maintain schedule, the general sequence of completion of State activities is New York, Missouri, then New Jersey. Federal Facilities Agreements (FFAs) have established the RI/FS schedule for the sites in St. Louis, Missouri; Maywood, New Jersey; and Wayne, New Jersey.

The driving force behind the RI/FS work is the need to understand site conditions so that eventual cleanup can be undertaken. Following cleanup, the goal is to release the properties for use with no radiological restrictions.

ACCOMPLISHMENTS (FY 1991 – 3Q FY 1992)

Environmental Restoration

New York Sites

- The first drafts of the characterization report, the RI Report, and the baseline risk assessment for Tonawanda sites were prepared.
- The draft RI report for Colonie was prepared for Headquarters, and work began on the FS/EA. Preparations for Colonie cleanup have begun with the initiation of the asbestos cleanup and issuance of the miscellaneous site services subcontract package for building preparation cleanup.
- Remedial action at two of the three Baker and Williams Warehouses was completed using an expedited remedial action process, and the first of two postremedial action reports was started.
- Consolidation of waste material from two interim storage piles into the waste containment structure was performed at Niagara Falls Storage Site.

New Jersey Sites

- FFAs were signed by DOE and EPA for the Wayne and Maywood, New Jersey, sites. FFA milestones were met by issuing the Wayne and Maywood EPA draft work plans.
- RI fieldwork was completed at the Wayne and Maywood Sites.
- Chemical characterization was completed at Middlesex.
- Environmental monitoring activities at New Brunswick were implemented.
- Per the FFAs signed by DOE and EPA for Maywood and Wayne in FY 1990, EPA was issued the Community Relations Plan, Field Sampling Plan, and Quality Assurance Project Plan. These documents have received EPA approval.
- A National Environmental Policy Act/CERCLA public scoping and planning meeting was conducted at both the Maywood and Wayne sites, and the responsiveness summary and integrated work plans are under development.

Missouri Sites

- Per the FFA signed by DOE and EPA for St. Louis sites in FY 1990, EPA was issued drafts of the St. Louis Work Plan, the RI Report, Community Relations Plan, initial screening of alternatives, Field Sampling Plan, Quality Assurance Project Plan, and St. Louis Baseline Risk Assessment. The Work Plan, Community Relations Plan, and RI Report have received EPA approval as final documents.
- An Engineering Evaluation/Cost Analysis (EE/CA) for cleanup and interim storage of contaminated soil at the St. Louis Downtown Site was published, and an EE/CA-Environmental Assessment for the St. Louis Airport Site vicinity properties and Latty Avenue vicinity properties was issued for public comment. Comments were received and development of the responsiveness summary initiated.
- Work has begun on upgrading Hazelwood Interim Storage Site.
- A NEPA/CERCLA public scoping and planning meeting was conducted, and a responsiveness summary and integrated work plan are under development.

Other Sites

- Remedial action (RA) was completed at Elza Gate in Oak Ridge, Tennessee, and Albany Research Center in Albany, Oregon.

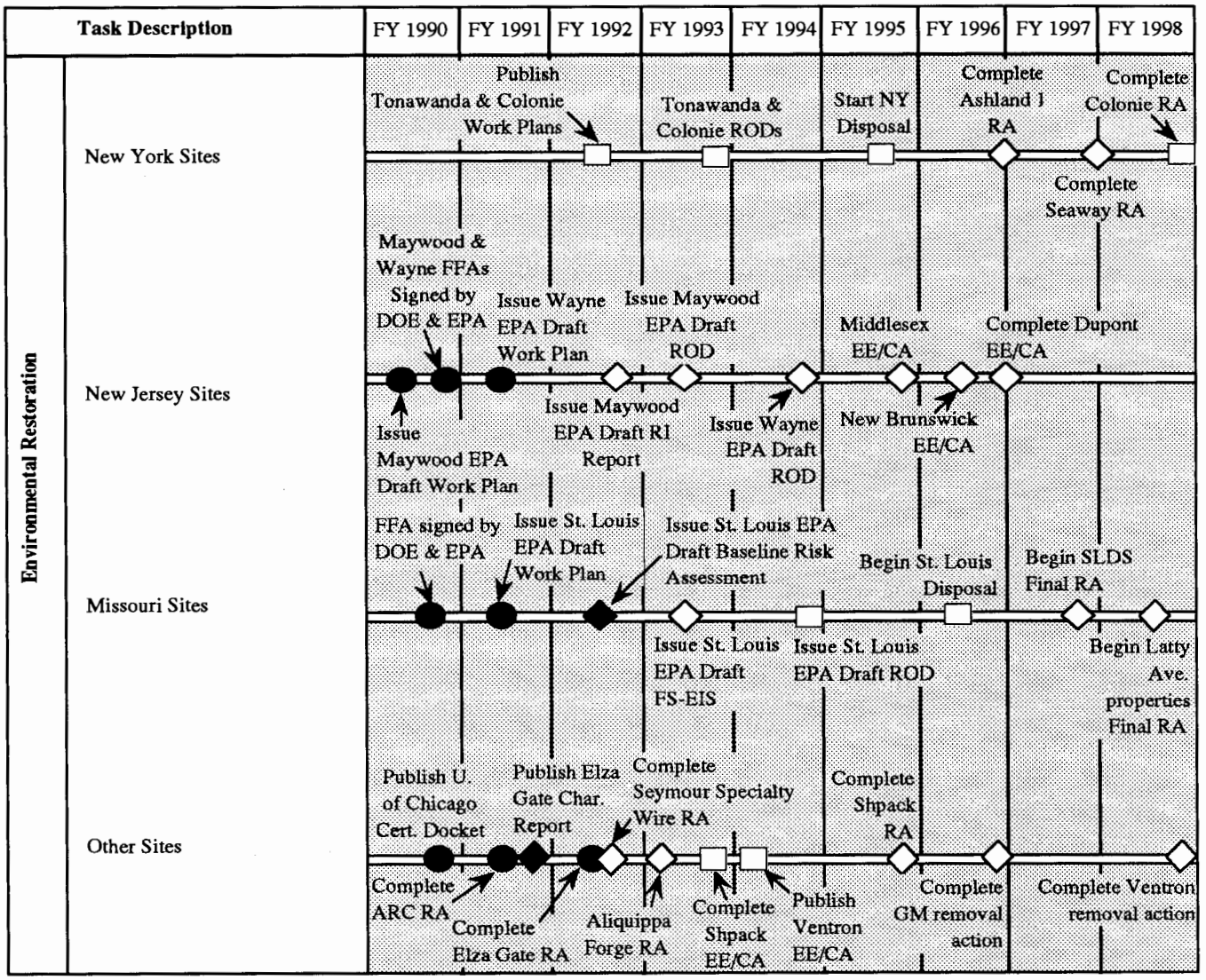
OAK RIDGE FIELD OFFICE
PROGRESS CHART
FORMERLY UTILIZED SITES REMEDIAL ACTION PROGRAM

Long-Term Objectives

Clean up all Tonawanda Sites by end of FY 1999.
Clean up all Missouri Sites by end of FY 2009.
Clean up all New Jersey Sites by end of FY 2011.
Program completion by end of FY 2016.

Five-Year Objectives

Issue Maywood EPA Draft ROD in FY 1993.
Issue Wayne EPA Draft ROD in FY 1994.
Issue Missouri EPA Draft ROD in FY 1994.
Cleanup Colonie Site by end of FY 1998.



Milestone Types	Milestone Status
○ Unchanged from FY 1993–1997 FYP	○ ◇ □ Planned
◇ New since FY 1993–1997 FYP	● ◆ ■ Complete
□ Changed from FY 1993–1997 FYP	50 percent complete
	– – – → Information flow

Notes and Acronyms

ARC - Albany Research Center
EE/CA - Engineering Evaluation/Cost Assessment
FFA - Federal Facilities Agreement
FS-EIS - Feasibility Study-Environmental Impact Statement
FYP - Five Year Plan
HISS - Hazelwood Interim Storage Site
RA - Remedial Action
RI - Remedial Investigation
SLDS - St. Louis Downtown Site

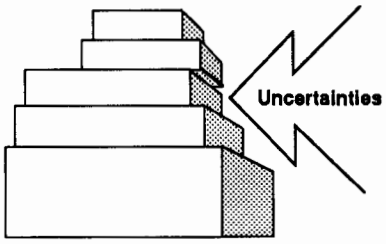
MAJOR MILESTONES

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
Environmental Restoration			
New York Sites			
• Announce ROD for Colonie, NY.	3Q FY 1993	4Q FY 1993[1]	Title 40 USC 9601, CERCLA, E.O. 12580
• Announce ROD for Tonawanda, NY.	4Q FY 1993	4Q FY 1993	Title 40 USC 9601, CERCLA, E.O. 12580
• Complete RA at Colonie, NY.	4Q FY 1995	4Q FY 1998[2]	Title 40 USC 9601, CERCLA, E.O. 12580
• Complete RA at Tonawanda, NY.	4Q FY 1997	4Q FY 1999	Title 40 USC 9601, CERCLA, E.O. 12580
New Jersey Sites			
• Issue EPA Draft ROD for Maywood, NJ.	4Q FY 1994	4Q FY 1993[3]	FFA, CERCLA Sect. 120
• Issue EPA Draft ROD for Wayne, NJ.	3Q FY 1995	4Q FY 1994[3]	FFA, CERCLA Sect. 120
Missouri Sites			
• Issue EPA Draft ROD for Saint Louis, MO.	3Q FY 1995	4Q FY 1994[3]	FFA, CERCLA Sect. 120
• Initiate St. Louis disposal.	3Q FY 1995	3Q FY 1996[2]	Title 40 USC 9601, CERCLA, E. O. 12580
Other Sites			
• Complete RA at Seymour Specialty Wire (Seymour, CN).	New	4Q FY 1992[4]	Title 40 USC 9601, CERCLA, E. O. 12580
• Complete RA at Aliquippa Forge, PA.	New	1Q FY 1993[5]	Title 40 USC 9601, CERCLA, E. O. 12580
• Complete RA at Venton, MA.	New	4Q FY 1998[5]	Title 40 USC 9601, CERCLA, E. O. 12580

[1]Slipped because of additional RI and EPA requirements.
[2]Slipped because of changes in outyear planning detail.
[3]Replaced with FFA milestone.
[4]Seymour remedial action moved forward and will be completed using expedited removal action process.
[5]Previous site milestone replaced based on rescheduling site activities.

EO - Executive Order
FFA - Federal Facilities Agreement
USC - *United States Code*

FIVE-YEAR PLAN ESTIMATES



There are a number of potential activities at Formerly Utilized Sites Remedial Action Project (FUSRAP) sites that may affect program requirements. These potential activities have not been included in the estimates below due to various uncertainties regarding scope of work, the phasing of regulatory reviews and approval schedules, availability of technology, lack of independent cost reviews and other factors. If further analysis of these uncertainties and potential additional work results in additional funding needs based on legal requirements, DOE will, through mechanisms such as reallocating budgetary resources, requesting funds through the normal appropriation process, supplemental requests or internal reprogramming, pursue funding for these activities, or where appropriate, based on technical reasons, enter into the formal conflict resolution process with regulatory bodies.

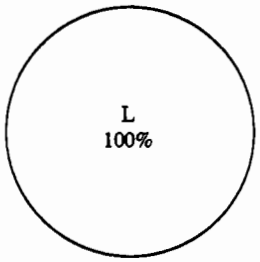
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Environmental Restoration	49,000	40,900	53,325	76,041	109,098	109,137	109,170
Total	49,000	40,900	53,325	76,041	109,098	109,137	109,170

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites.

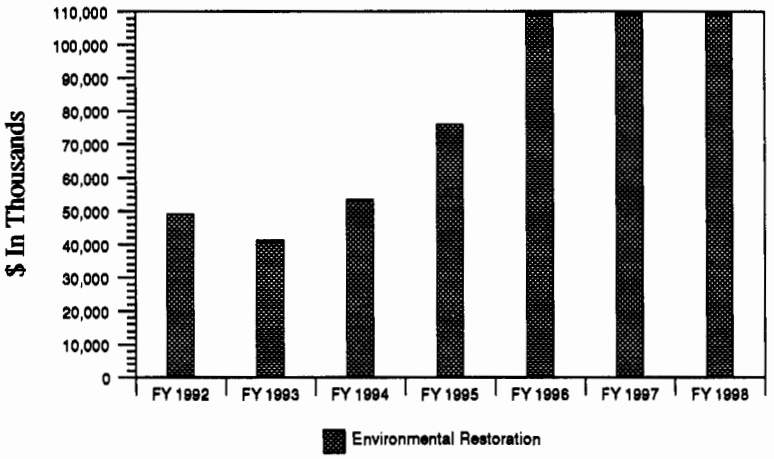
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



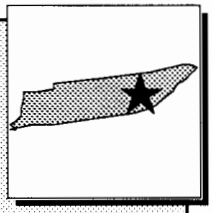
L- Legally Driven Requirements

Estimates by Year



For further information regarding FUSRAP, call (615) 576-1590.

OAK RIDGE FIELD OFFICE
INSTALLATION SUMMARY
OAK RIDGE K-25 SITE



DESCRIPTION

The Oak Ridge K-25 Site occupies a 1500-acre area adjacent to the Clinch River, approximately 13 miles west of the city of Oak Ridge, Tennessee. The K-25 Site originally produced enriched uranium hexafluoride for defense purposes and for fuel for commercial reactors. A declining demand for enriched uranium caused the enrichment process at the K-25 Site to be shut down in 1987. The K-25 Site now serves as the location for many contractor central staff functions, environmental restoration and waste management organizations, and operating waste treatment and storage facilities. Most notably, the K-25 Site hosts the Toxic Substances Control Act (TSCA) Incinerator, a facility for the destruction of mixed wastes.

STRATEGIC OUTLOOK

Since the K-25 Site uranium enrichment operations were shutdown in 1987, the environmental restoration and waste management programs have emerged as significant activities at the site. In addition, portions of the site have been placed under the decontamination and decommissioning (D&D) program. The site also plays a major role in the storage of waste destined for the TSCA Incinerator and for low-level and mixed waste until treatment and disposal options are available.

The K-25 Site D&D program will continue to perform Phase I activities until FY 1998 with the removal of hazardous materials and equipment such as asbestos polychlorinated biphenyl (PCB)-contaminated oils, utilities, ventilation, lubrication, and cooling systems from the buildings. In addition, uranium deposits will be removed from process equipment; buildings will be characterized for radiological contamination; and pilot-scale projects will be implemented to test and evaluate D&D technologies before full-scale decontamination, dismantlement, and demolition of the buildings take place.

Within the Environmental Restoration Program, site assessments will continue to be the focus through FY 1998 with Remedial Investigation/Feasibility Studies (RI/FSs) planned for 16 Operable Units (OUs) and Preliminary Assessment/Site Investigation (PA/SIs) planned for 12 other sites. Investigations will continue according to priorities based on risks to human health and the environment. In addition, remediation work, such as the K-1414 Bioremediation Project, will continue. Significant planned remedial actions will accompany the following Records of Decision (RODs): K-1407-B and C Ponds (1993), K-1070 OU (1998) and the K-901 OU (1998). Interim corrective actions will continue to be initiated as needed.

Because the environmental restoration and D&D activities associated with the site are becoming significant contributors of waste, the need for waste treatment, storage, and disposal services will increase. Future waste management initiatives include implementation of certification and characterization programs to ensure that facilities operate in accordance with performance objectives, with emphasis on waste minimization, and with the use of commercial treatment resources. The TSCA Incinerator will continue to provide treatment capacity for burnable mixed wastes from the Oak Ridge Reservation (ORR) and other regional sites.

STRATEGIC OUTLOOK (Continued)

The K-25 Site will play an increasing role in developing and demonstrating new technologies as part of DOE's Technology Development Program to address DOE's diverse environmental and waste management needs. To support the D&D of the significant number of buildings and other structures on-site, K-25 Site research will focus on developing technologies and techniques used in the D&D of concrete and metal structures and equipment. The objective of the Site's research and demonstration of innovative technologies is to ensure availability of the most cost-effective and energy-efficient techniques to advance remediation and waste management methods at the K-25 Site and other DOE sites.

ACCOMPLISHMENTS (FY 1991 – 3Q FY 1992)

Corrective Activities

- Completed the designs for rerouting the K-25 Site Steam Plant storm drain and softener system. Removed usable coal from the Steam Plant coal pile.

Waste Management

- Destroyed 2.1 million pounds of hazardous/mixed waste at the TSCA Incinerator in FY 1991 and 2.5 million pounds in FY 1992. The wastes were received from throughout ORR, the Paducah Gaseous Diffusion Plant, the Portsmouth Gaseous Diffusion Plant, and the Fernald Environmental Management Project.
- Refurbished seven vaults in the K-25 building to meet permit standards for hazardous and mixed waste storage. This space will be used to store waste from Oak Ridge National Laboratory, Oak Ridge Y-12 Plant, and the K-25 Site.
- Operated the Oak Ridge Filter Test Facility and provided high-efficiency particulate air filter (HEPA) and respiratory canister testing for DOE's facilities east of the Mississippi River.
- Completed the conceptual design report for ORR Storage Facilities Project. Also critical siting studies and facility selection studies were completed.
- Completed the revised Conceptual Design Reports for the Class I and Class II Low-Level Waste Disposal Facilities Project. Completed siting evaluations and selections.
- Developed an implementation plan at the K-25 Site for operation of the Central Neutralization Facility in compliance with proposed National Pollutant Discharge Elimination System (NPDES) permit limits. Planning activities were initiated for a project to relocate the permitted outfall of the Central Neutralization Facility.
- Developed a formal Waste Minimization Program for the K-25 Site in FY 1991. The "Oak Ridge K-25 Site Pollution Prevention Program Plan" (K/WD-10, Rev. 1) was issued in December 1991. This plan documented pollution prevention goals for the K-25 Site, including the Waste Management Division.
- Developed requirements for the K-25 Waste Certification and Verification Program and submitted the Integrated Waste Management Plan for the K-25 Site.

Environmental Restoration

- Completed Phase 1 RFIs at (1) K-1070-C/D Classified Burial Ground, (2) K-1407-B Holding Pond, (3) K-1407-C Retention Basin, (4) K-1420 Waste Group, (5) K-1070A Burial Ground, and (6) K-770 Scrap Metal Yard.

ACCOMPLISHMENTS (Continued)

- Removed six underground petroleum storage tanks.
- Completed characterization of the K-1414 diesel fuel leak.
- Began processing and storage of stabilized sludge drums from the K-25 Site vaults and K-1417 drum storage yard and began construction of new storage facilities.
- Removed over 5000 linear feet of asbestos insulation from facility piping.
- Disposed of 155,000 gallons of oil with regulated PCB concentrations.
- Removed and transferred more than 250 large electrical components to the Tennessee Valley Authority for reuse.

Technology Development

- Issued report: "Decontamination and Decommissioning Integrated Demonstration (ID) Strategy, Predecisional Draft," October 1991.
- Issued report on the applicability of the British Nuclear Fuels, Ltd. decontamination process to the K-25 Site.
- Issued report on in situ liquid-phase decontamination of centrifugal gaseous diffusion plant compressors.

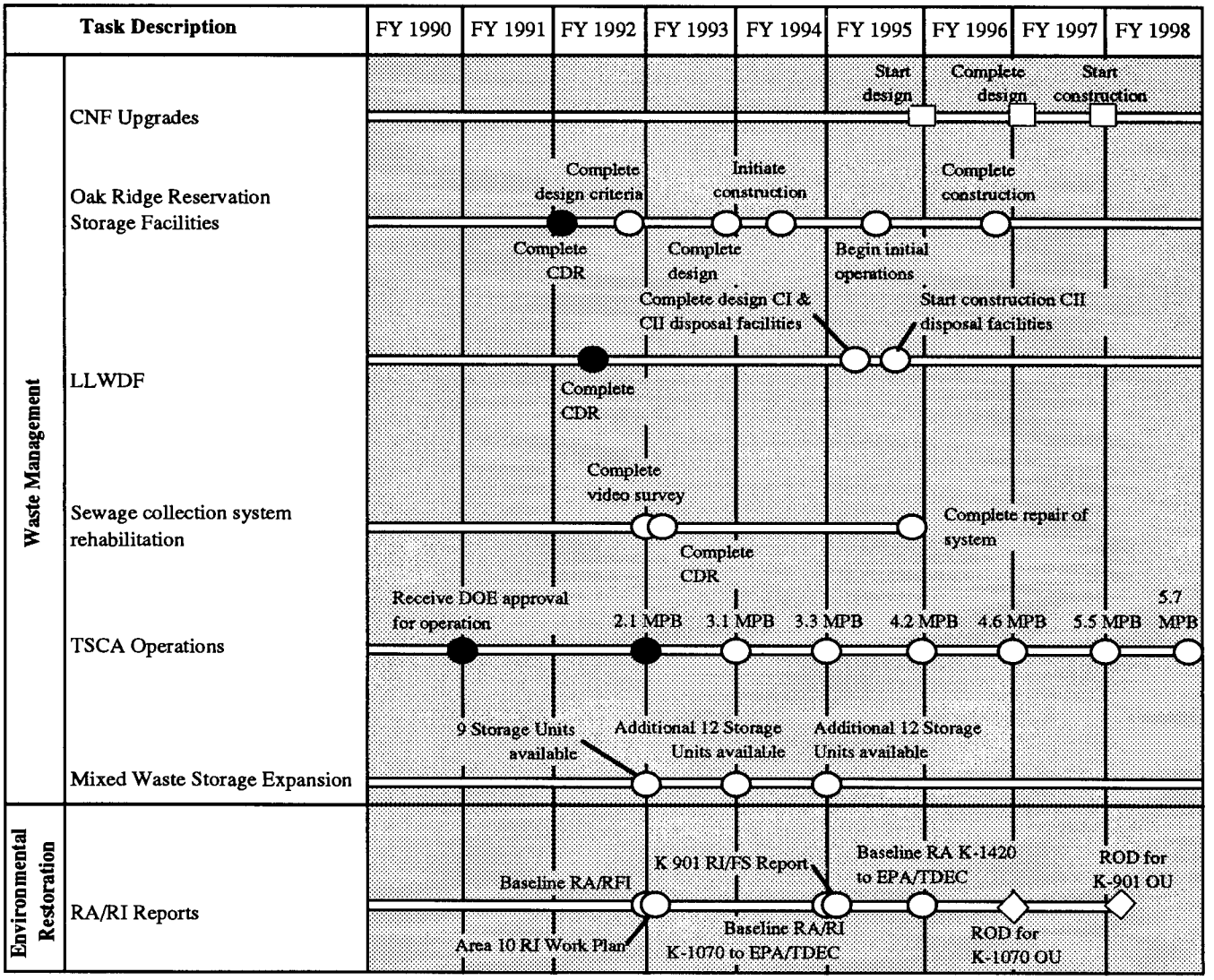
OAK RIDGE FIELD OFFICE
PROGRESS CHART
K-25 SITE

Long-Term Objectives

Complete RIs and clean up all the SWMUs by 2019.
Complete the Sludge Management Project to ensure maximum protection of health and environment and to meet all regulatory requirements.
Provide disposal capability for CI and CII waste.

Five-Year Objectives

Complete RIs and initiate cleanup activities at nine SWMUs.
Complete the Sludge Management Project to ensure maximum protection of health and environment and to meet all regulatory requirements.
Provide storage space for interim storage of solid low-level waste.



Milestone Types	Milestone Status
○ Unchanged from FY 1993-1997 FYP	○ ◇ □ Planned
◇ New since FY 1993-1997 FYP	● ◆ ■ Complete
□ Changed from FY 1993-1997 FYP	50% complete
	Information flow

Notes and Acronyms

CDR-Conceptual Design Report
CI-Class L-I Low-Level Waste
CII-Class L-II Low-Level Waste
CNF-Central Neutralization Facility
FYP-Five-Year Plan
LLWDF-Low-Level Waste Disposal Facility
MPB- Millions of pounds burned
OU-Operable Unit
RA/RI-Risk Assessment/Remedial Investigation
RFI-RCRA Facility Investigation
RI-Remedial Instivestigation
SWMU-Solid Waste Management Unit
TDEC-Tennessee Department of Environment & Conversation

MAJOR MILESTONES

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
Corrective Activities			
• Complete Steam Plant Coal Pile Removal Permit and Reclamation.	New	1Q FY 1993	NPDES TN 0002950
Waste Management			
• Complete conversion of nine vaults to mixed storage.	New	4Q FY 1992	40 CFR 264.12
• Complete destruction of 2.5 million pounds of waste.	4Q FY 1992	4Q FY 1992	TN Air Permit 032449I
• Complete conversion of 12 vaults to mixed storage.	New	4Q FY 1993	40 CFR 264.12
• Complete Conceptual Design Report (CDR) for sewage collection system rehabilitation (former CA project).	New	1Q FY 1993	NPDES Permit TN 0002950
• Complete conversion of 12 vaults to mixed storage.	New	4Q FY 1994	40 CFR 264.12
• Begin K-1515 Sanitary Plant Waste Disposal final design (former CA project).	New	1Q FY 1993	NPDES Permit TN 0002950
• Complete CDR for the Central Neutralization Facility pipeline extension.	New	1Q FY 1993	NPDES Permit TN 0002950
• Develop Integrated Waste Management Program Plan for ORR.	New	1Q FY 1993	DOE Order 5480.2A
• Complete design for ORR storage facilities project.	New	4Q FY 1993	DOE Order 5480.2A
• Start construction of Class L-II Disposal Facility.	New	4Q FY 1995	DOE Order 5480.2A
• Complete Sewage Collection System Rehabilitation Disposal Facility.	1Q FY 1994	3Q FY 1995[1]	NPDES Permit TN 0002950

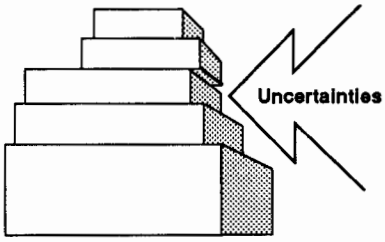
MAJOR MILESTONES (Continued)

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
Environmental Restoration			
• Obtain Interim ROD for SW31 Leachate Stream.	New	4Q FY 1992	ORR FFA Sect. XIV
• Obtain ROD on K-1407-B and ROD for K-1407-C.	New	1Q FY 1993	ORR FFA Sect. XIV
• Complete remediation for SW31 Lechate Stream	New	1Q FY 1996	ORR FFA Sect. XIV
• Obtain ROD on K-1070 OU.	New	3Q FY 1997	ORR FFA Sect. XIV
• Obtain ROD for Area K-901.	New	2Q FY 1998	ORR FFA Sect. XIV
• Complete Pond Waste Management Project.	New	2Q FY 1993	40 CFR 264, 265, 268, 270
• Obtain IROD for K-720 Behan Ash Pile.	New	3Q FY 1993	ORR FFA Sect. XIV
• Issue report on the technology logic diagram (decision support tool) for the K-25 Site.	New	4Q FY 1992	DOE Order 4700.1
• Verify remediation on K-1407B and K-1407C ponds.	New	2Q FY 1995	ORR FFA Sect. XIV
• Submit draft Decontamination and Decommissioning Integrated Demonstration Management Plan.	New	4Q FY 1992	DOE Order 5820.2A
• Complete closure for K-1417 and K-1419.	New	2Q FY 1994	RCRA Interim Status
• Complete final draft of generic analytical chemistry quality assurance document.	New	3Q FY 1992	ORR FFA Sect. XXVIII
Technology Development			
• Support investigation and demonstration of waste management and environmental restoration technologies.	New	1Q FY 1995	DOE Management Initiative

[1]Project was rescoped to meet additional requirements.

CFR - *Code of Federal Regulations*
FFA - Federal Facilities Agreement
FFCA - Federal Facility Compliance Agreement
NPDES - National Pollutant Discharge Elimination System

FIVE-YEAR PLAN ESTIMATES



There are a number of potential activities at the Oak Ridge K-25 Site that may affect program requirements. These potential activities have not been included in the estimates below due to various uncertainties regarding scope of work, the phasing of regulatory reviews and approval schedules, availability of technology, lack of independent cost reviews and other factors. Uncertainties in part at the K-25 Site are related to additional landlord activities and treatment, storage and disposal actions and the potential for new work. If further analysis of these uncertainties and potential additional work results in additional funding needs based on legal requirements, DOE will, through mechanisms such as reallocating budgetary resources, requesting funds through the normal appropriation process, supplemental requests or internal reprogramming, pursue funding for these activities, or where appropriate, based on technical reasons, enter into the formal conflict resolution process with regulatory bodies.

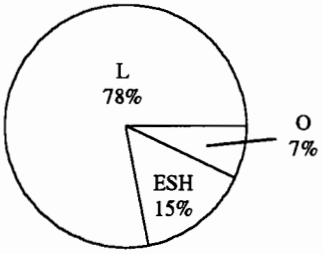
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Corrective Activities/Waste Management	63,995	91,883	118,425	127,925	140,283	153,878	157,180
Environmental Restoration	73,372	110,026	184,285	172,102	173,794	176,702	219,834
Total	137,367	201,909	302,710	300,027	314,077	330,580	377,014

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites.

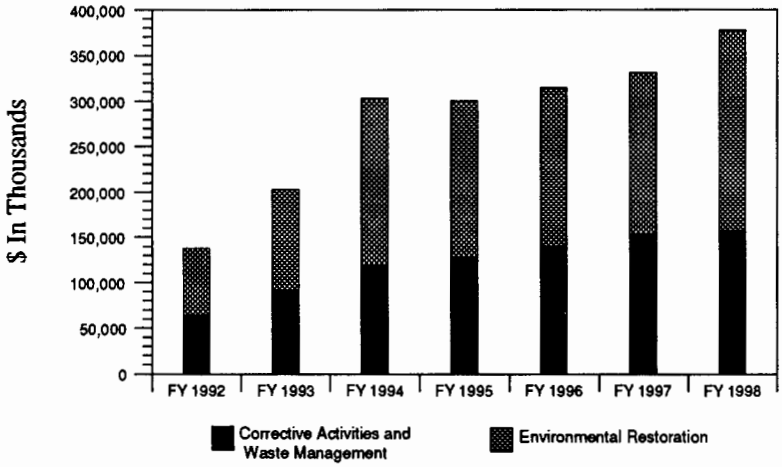
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



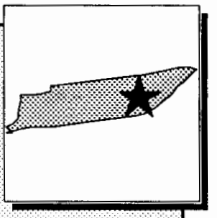
L- Legally Driven Requirements
ESH- Environment, Safety, and Health Requirements
O- Other Desirable Activities

Estimates by Year



For further information regarding the Oak Ridge K-25 Site, call (615) 576-1590.

OAK RIDGE FIELD OFFICE
INSTALLATION SUMMARY
OAK RIDGE NATIONAL LABORATORY



DESCRIPTION

The Oak Ridge National Laboratory (ORNL) occupies several sites and covers approximately 2900 acres in Melton and Bethel Valleys, ten miles southwest of the city of Oak Ridge, Tennessee. ORNL's mission is to conduct applied research and development (R&D) in support of DOE programs in fusion, fission, conservation, fossil, and other energy technologies and to perform basic research in selected areas of the physical and life sciences. Past 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 (ORR), which includes ORNL, was placed on the National Priorities List in 1989. A CERCLA Federal Facilities Agreement (FFA) and a Federal Facility Compliance Agreement (FFCA) for RCRA Land Disposal Restricted (LDR) waste became effective in 1992.

STRATEGIC OUTLOOK

The primary outlook for waste management activities at ORNL is to provide waste treatment, storage, and disposal (TSD) support to DOE's multifaceted R&D programs.

In addition to the variety of environmental regulations and DOE Orders governing waste management, specific aspects at ORNL will be directed by the recently signed FFA, the Tennessee Oversight Agreement, and the FFCA for RCRA wastes. These agreements will significantly affect the future of waste management and require operational improvements. Among areas of emphasis will be increased attention to waste reduction activities; full implementation of waste certification and characterization programs for all waste types; continued improvement of TSD facility operations through routine maintenance, operator training, and facility upgrades; and involvement of private industry capabilities.

At this time, transition planning activities to ensure an orderly transition of surplus contaminated facilities to EM for decontamination and decommissioning (D&D) are projected to begin in FY 1995 at ORNL. Several facilities have been identified for potential transfer to EM, but all plans are preliminary and more information is forthcoming.

Remedial action at ORNL is proceeding under the FFA for the ORR. For the FFA, ORNL has been divided into 20 regions known as waste area groupings (WAGs) for the purpose of assessment and cleanup. Preliminary investigations indicate no need for further action in eight WAGs. The remaining WAGs (1 through 11 and 13) contain about 222 sites of contamination where investigations and remediation continue. Current activity is focused upon Interim Actions (with Interim Records of Decision, or IRODs) which address conditions with potential for affecting human health and the environment. Interim remedial measures have been identified and planned at most of the remaining ORNL WAGs.

The technology development program addresses DOE's diverse environmental and waste management needs. This program involves developing new technologies as well as demonstrating or modifying existing

STRATEGIC OUTLOOK (Continued)

techniques to ensure availability of the most cost-effective and technologically advanced remediation and waste management methods, and developing energy-efficient waste minimization techniques. Technology areas currently under investigation include bioremediation, D&D, extraction/thermal treatment, and robotics projects.

ORNL supports the Transportation Logistics Program within the Office of Technology Development. This Program establishes DOE procedures for the safe and cost-effective transportation of hazardous materials (particularly radioactive) substances and wastes in support of DOE programs.

ACCOMPLISHMENTS (FY 1991 – 3Q FY 1992)

Corrective Activities

- A fixed-price contract for the Bethel Valley Liquid Low-Level Waste (LLLW) Collection and Transfer (CAT) System, an FY 1988 line item project, was awarded. The Melton Valley LLW CAT System, an FY 1992 line item, has been validated for $41 million.

Waste Management

- Prepared for implementation of FFA requirements that mandate extensive assessment, upgrade, and replacement of liquid radioactive WM systems.
- Implemented major recycling initiatives for waste paper, cardboard, and aluminum cans, thereby avoiding the need for disposal of tons of these materials.
- Completed a two-year demonstration phase of improved engineered disposal technology for solid LLW (Tumulus I and II) and initiated operational-scale implementation (Interim WM Facility).
- Using commercial services, conducted and successfully completed a campaign to retrieve and solidify 50,000 gallons of liquid radioactive wastes from storage and alleviated a significant shortage of storage capacity.
- Maintained compliant operation of waste treatment, storage, and disposal facilities for management of solid and liquid radioactive wastes, hazardous and mixed wastes, and solid sanitary/industrial wastes – including treatment of 400,000 gallons of LLLW, storage of 45,000 gallons of liquid mixed waste and 54,000 cubic feet of solid LLW.
- Completed conceptual design for new facilities to store LLLW to meet requirements generated by remedial actions.

Environmental Restoration

- Approximately 300 RCRA/CERCLA units, divided into 20 WAGs, have been identified at ORNL. Two hundred 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 transuranic (TRU) radioactive waste. Nonradioactive wastes include organic solvents, corrosive waste, polychlorinated biphenyls (PCBs), and heavy metals.
- The WAG 6 feasibility study/environmental assessment has been submitted to EPA Region IV and the Tennessee Department of Environment and Conservation (TDEC).
- Phase I remedial investigation (RI) field activities have been completed in WAG 1 and initiated in WAG 5.
- Federal Facilities Agreement (FFA) plans and schedules for LLLW tank deliverables have been finalized.

ACCOMPLISHMENTS (Continued)

- Remediation is complete at the White Oak Creek Embayment and Tank 7860A. Work is nearing completion at the 3001 Storage Canal.

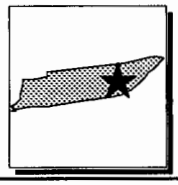
Technology Development

- Completed in situ vitrification demonstration of radioactive trench. Showed that radioactive materials in trenches can be "fixed" in place.
- Developed remote surface scanning technology for surface mapping of Fernald silos in support of remediation action. This work resulted in an estimated $25 million savings.
- Initiated a Cooperative Research and Development Agreement (CRADA) with General Electric Company (GE) for PCB bioremediation work. By collaborating with GE, DOE is able to leverage funding and obtain much more information for a smaller investment.
- Constructed portable Derivative Ultraviolet Absorption Spectrometry, which provides rapid, in situ screening for aromatic contaminants.

Transportation

- Continued to provide an effective regulatory compliance training program on a DOE-wide basis to ensure transportation and packaging personnel are current on regulations.
- Initiated the enhancement of the Expert Motor Carrier Selection System (EMCASS) for use at DOE sites.
- Continued the operation of the Shipment Mobility/Accountability Collection (SMAC) system, which was designed to collect, process, store, and retrieve data on shipments made to and from DOE facilities.
- Continued operation of the TRANSCOM tracking and two-way communication system designed to monitor the movement of high-visibility shipments.

OAK RIDGE FIELD OFFICE
PROGRESS CHART
OAK RIDGE NATIONAL LABORATORY



	Task Description	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994
Corrective Activities and Waste Management	Liquid Low-Level Waste Collection and Transfer System		Begin Bethel Valley Project			
	Hazardous and Mixed Waste			Begin processing mixed waste at K-25 TSCA Incinerator		Complete characterization of stored mixed waste
	Transuranic Waste			Initiate RCRA-Permitted Storage of CH-TRU Waste	Complete RCRA Permitted RH-TRU Storage Bunker	
	Solid Low-Level Waste		Fill Tumulus II open IWMF			Open Class III/IV Above Ground Storage Facility
	Liquid Radioactive Waste				Open Class I, III/IV Below Ground Storage Facility	Begin MVST Capacity Increase
	Waste Reduction	Begin Paper and Aluminum Recycling		Provide FFA deliverables and implement contingency; Conduct Pilot PWA		Replace LLLW Evaporation; Conduct PWA on steam plant; Reduce solid waste disposal by 50%
Environmental Restoration	Interim Corrective Measures Implemented			White Oak Creek Embayment; WAG 11 and 13 IRODs		Well P&A IROD
	Remedial Investigations/ Feasibility Studies			WAG 6 IROD		

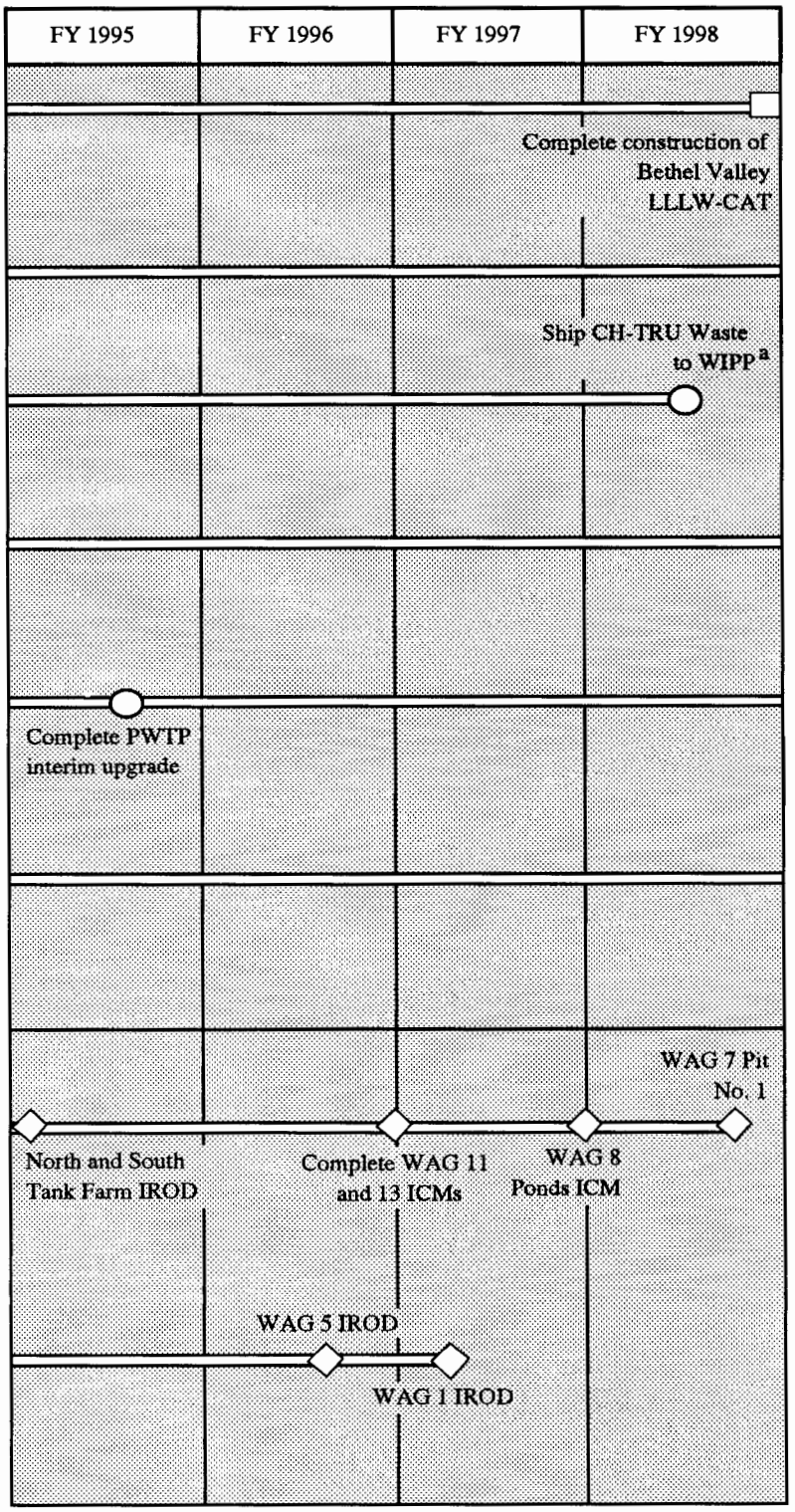
OAK RIDGE NATIONAL LABORATORY

Long-Term Objectives

Complete RI/FS/NEPA/RAP/IROD process on all WAGs; remediation of inactive LLLW tank contents; remediate most WAGs.

Five-Year Objectives

Remediate WAG 6; complete three RIs; continue S&M; complete ICMs necessary to protect human health and the environment.



Milestone Types

- Unchanged from FY 1993-1997 FYP
- New since FY 1993-1997 FYP
- Changed from FY 1993-1997 FYP

Milestone Status

- Planned
- Complete
- 50 percent complete
- Information flow

Notes and Acronyms

[a] Milestone date is subject to availability of WIPP site for storage of TRU waste.

CAT-Collection and Transfer
CH-TRU-Contract Handled Transuranic
FFA-Federal Facilities Agreement
FS-Feasibility Study
FYP-Five-Year Plan
ICM-Interim Corrective Measure
IROD- Interim ROD
IWMF-Interim Waste Management facility
LDR-land disposal restriction
LLLW-liquid low-level waste
MVST-Melton Valley Storage Tank
NEPA-National Environmental Policy Act
PWA-Process Waste Assessment
PWTP-Process Waste Treatment Plant
RAP-Remedial Action Program
RH-TRU-Remote Handled Transuranic
RI-Remedial Investigation
ROD-Record of Decision
S&M-Surveillance and Maintenance
SWSA-Solid Waste Storage Area
TSCA-Toxic Substances Control Act
WAG-Waste Area Grouping

MAJOR MILESTONES	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
Corrective Activities			
• Complete construction of liquid low-level waste (LLLW) collection and transfer system for Bethel Valley (Phase I).	4Q FY 1993	4Q FY 1998[1]	ORR FFA Sect. IX
• Complete construction of LLLW collection and transfer system for Melton Valley.	1Q FY 1998	4Q FY 1996[2]	ORR FFA Sect. IX
Waste Management			
• Issue Federal Facilities Agreement (FFA) Deliverables Document.	2Q FY 1992	2Q FY 1992	ORR FFA Sect. IX
• Issue Final Report on Characterization of Stored Mixed Waste.	3Q FY 1992	3Q FY 1993[1]	DOE Order 5820.2A 40 CFR 261, 268
• Complete construction of Remote-Handled TRU Waste Storage Bunker.	New	4Q FY 1993	DOE Order 5820.2A
• Complete receipt of Nuclear Fuel Services waste.	New	2Q FY 1993	40 CFR 264
• Complete detailed design for the Waste Characterization and Certification Facilities.	1Q FY 1996	3Q FY 1995[2]	40 CFR 261.11 40 CFR 261.40
• Complete design of Bethel Valley FFA upgrade.	4Q FY 1996	1Q FY 1996[3]	ORR FFA Sect. IX
• Complete construction of Melton Valley Storage Tank capacity increase.	New	1Q FY 1999	DOE Order 5820.2A
• Complete construction of Process Waste Treatment Facility.	1Q FY 1998	1Q FY 2000[1]	DOE Order 5820.2A
Environmental Restoration			
• Complete White Oak Creek Embayment removal action.	1Q FY 1992	3Q FY 1992[4]	ORR FFA Sect. XIII
• Submit WAG 6 Interim Record of Decision (IROD) to EPA/TDE.	1Q FY 1993	1Q FY 1993[5]	ORR FFA Sect. XIV
• Submit WAG 11 debris removal IROD to EPA/TDEC.	4Q FY 1992	4Q FY 1992	ORR FFA Sect. XIV

MAJOR MILESTONES (Continued)

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
• Submit WAG 13 Cesium Plots IROD to EPA/TDEC.	New	4Q FY 1992	ORR FFA Sect. XIV
• Submit WAG 1 Phase I RI Report to EPA/TDEC.	New	4Q FY 1992	ORR FFA Sect. X
• Complete liquid contents removal from five inactive LLLW tanks.	New	4Q FY 1993	ORR FFA Sect. IX
• Submit well plugging and abandonment (P&A) IROD to EPA/TDEC.	New	4Q FY 1993	ORR FFA Sect. XIV
• Complete support facilities construction for the WAG 6 Site Remediation.	New	1Q FY 1994[6]	ORR FFA Sect. XIV
• Submit North and South Tank Farms IROD to EPA/TDEC.	New	2Q FY 1996	ORR FFA Sect. XIV
• Submit WAG 5 site remediation IROD to EPA/TDEC.	New	2Q FY 1996[7]	ORR FFA Sect. XIV
• Submit WAG 1 Feasibility Study/Environmental Assessment (FS/EA) to EPA/TDEC.	4Q FY 1996	2Q FY 1996[8]	ORR FFA Sect. XI
• Submit WAG 1 IROD to EPA/TDEC.	4Q FY 1997	2Q FY 1996[8]	ORR FFA Sect. XIV
• Complete construction of WAG 6 site remediation.	3Q FY 1997	4Q FY 1997[6]	ORR FFA Sect. XV
• Complete WAG 7 Pit No. 1 ICM.	New	3Q FY 1998	ORR FFA Sect. XV

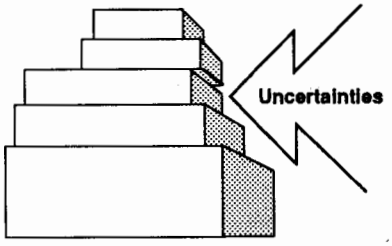
MAJOR MILESTONES (Continued)

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
Transportation			
• Begin implementation of the Centralized Packaging Management Concept.	New	FY 1994	DOE Management Initiative
• Complete EMCASS enhancements and merge with ATMS.	New	FY 1993	DOE Management Initiative
• Complete the "Transportation Integration" effort.	New	FY 1994	DOE Management Initiative
• Begin work on the Transportation Professional Development Effort.	FY 1993	FY 1993	DOE Management Initiative

[1] Slipped because of reprioritization of projects.
[2] Accelerated need for additional capacity to characterize waste for shipment.
[3] Congressionally mandated accelerator.
[4] Slipped as a result of technical difficulties associated with construction; now complete.
[5] This activity has been redefined based on comments from EPA and TDEC.
[6] Slipped as a result of refinement of the WAG 6 remediation schedule.
[7] This activity has been accelerated through use of the "observational approach" and negotiations with EPA and TDEC.
[8] Based on revised RI/FS Work Plan.

CFR - *Code of Federal Regulations*
ORD - Administrative, Consent or Compliance Order
ORR FFA - Oak Ridge Reservation Federal Facilities Agreement

FIVE-YEAR PLAN ESTIMATES



There are a number of potential activities at the Oak Ridge National Laboratories that may affect program requirements. These potential activities have not been included in the estimates below due to various uncertainties regarding scope of work, the phasing of regulatory reviews and approval schedules, availability of technology, lack of independent cost reviews and other factors. If further analysis of these uncertainties and potential additional work results in additional funding needs based on legal requirements, DOE will, through mechanisms such as reallocating budgetary resources, requesting funds through the normal appropriation process, supplemental requests or internal reprogramming, pursue funding for these activities, or where appropriate, based on technical reasons, enter into the formal conflict resolution process with regulatory bodies.

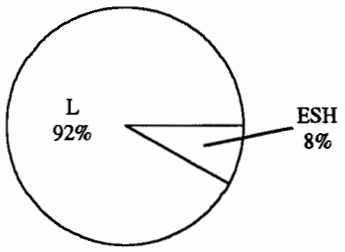
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Corrective Activities/Waste Management	62,406	105,858	104,021	121,715	128,034	134,986	136,675
Environmental Restoration	61,994	79,830	91,050	104,119	142,175	148,030	155,941
Facility Transition	0	2,000	0	0	0	0	0
Total	124,400	187,688	195,071	225,834	270,209	283,016	292,616

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites.

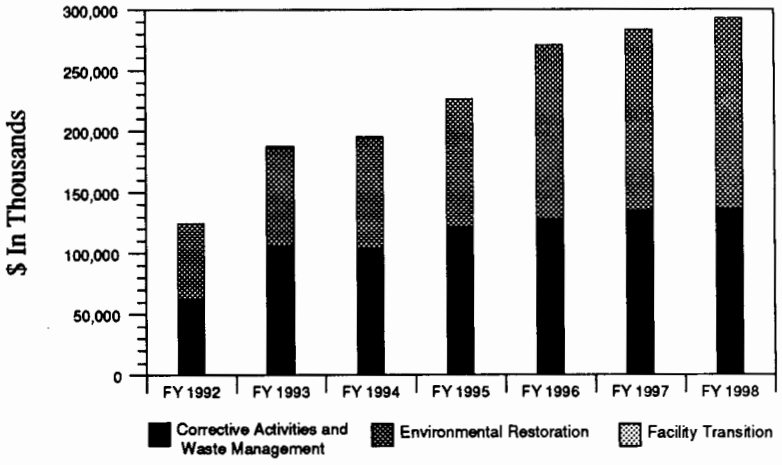
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



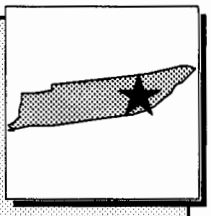
L- Legally Driven Requirements
ESH- Environment, Safety, and Health Requirements

Estimates by Year



For further information regarding Oak Ridge National Laboratory, call (615) 576-1590.

OAK RIDGE FIELD OFFICE
INSTALLATION SUMMARY
OAK RIDGE Y-12 PLANT



DESCRIPTION

The Oak Ridge Y-12 Plant occupies an 811-acre site in the Bear Creek Valley about two 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 an 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 treatment, storage, or disposal of hazardous and radioactive materials and wastes. Examples of these include landfills, incinerators, surface storage areas, aboveground and underground tanks, surface impoundments, and treatment facilities. The Oak Ridge Reservation (ORR), which includes the Y-12 Plant, was placed on the National Priorities List in 1989.

STRATEGIC OUTLOOK

Waste management activities at the Y-12 Plant will continue to treat, store, and dispose of waste generated by Defense Programs (DP) and other resident programs. The decreasing amount of waste generated by defense production at the Y-12 Plant is expected to be offset by waste from weapon dismantlement activities, while the volume of waste from environmental restoration and decontamination and decommissioning (D&D) activities will significantly increase. DOE is evaluating the impact of these changes on future waste management needs at the Y-12 Plant.

Y-12 Plant waste management will stress certification and characterization, as typified by the development of the Crated Waste Assay Monitoring System, to ensure that waste management operations comply with performance objectives, augment waste minimization programs, and initiate privatization for management of certain waste streams.

With the proposal to consolidate the nonnuclear component manufacturing activities associated with the nuclear weapons complex, transition activities at the Y-12 Plant are currently in the planning stage. At this time, plans are preliminary and more information is forthcoming.

Technology development activities address DOE's diverse environmental and waste management needs. The technology development activities involve developing new technologies as well as demonstrating or modifying existing techniques to ensure availability of the most cost-effective and technologically advanced remediation and waste management methods and developing energy-efficient waste minimization techniques. This program participates in the selection of technology for the Depleted Uranium Integrated Demonstration and supports the D&D program.

Remedial action activities for the Y-12 Plant are being performed to comply with two principal regulatory drivers. The recently signed Federal Facilities Agreement requires (pursuant to CERCLA) that assessment and remediation of contaminated sites be performed in accordance with milestones negotiated yearly.

STRATEGIC OUTLOOK (Continued)

Additionally, RCRA, as amended, requires closure of several land-based hazardous waste management units.

The Y-12 Plant will continue to perform its work toward the goal of reducing human health risks, minimizing environmental damage, and complying with all applicable regulations, agreements, and laws.

ACCOMPLISHMENTS (FY 1991 – 3Q FY 1992)

Corrective Activities

- Completed a feasibility study evaluating alternatives for mitigation of residual chlorine in effluents from cooling towers.
- Completed a survey of the sanitary sewer system to identify needs for rehabilitation and elimination of cross connections between the sanitary sewer system and the storm drainage system.

Waste Management

- Ceased disposal operations at the Bear Creek Burial Ground in compliance with a directive from the Tennessee Department of Environment and Conservation.
- Completed Phase I of the Waste Tracking Project, a project to enable efficient management and reporting of wastes generated at the Y-12 Plant.
- Completed process waste assessments on six of the Y-12 Plant's major process areas to identify opportunities for waste minimization.
- Completed the conceptual design report and safety assessment for the Industrial Waste Compaction Facility.

Environmental Restoration

- Six Remedial Investigation Reports have been prepared and four have been submitted to regulators.
- Eight Remedial Investigation Work Plans have been prepared and submitted to regulators.
- To date, eight of 13 RCRA closures have been completed (seven with State-approved certifications). For the remaining five, two are in progress, and closure plans have been submitted for the other three.
- Sampling fieldwork was performed at three sites during the period. The Bear Creek Valley Dense Non-Aqueous Phase Liquid assessment project is currently under way.
- One Feasibility Study is under way for East Fork Poplar Creek.
- One Record of Decision (ROD) and one Interim Record of Decision (IROD) have been completed and signed by regulators. An additional IROD Proposed Plan was submitted to regulators for review.
- Six data adequacy summaries were prepared, and five were submitted to regulators for review.

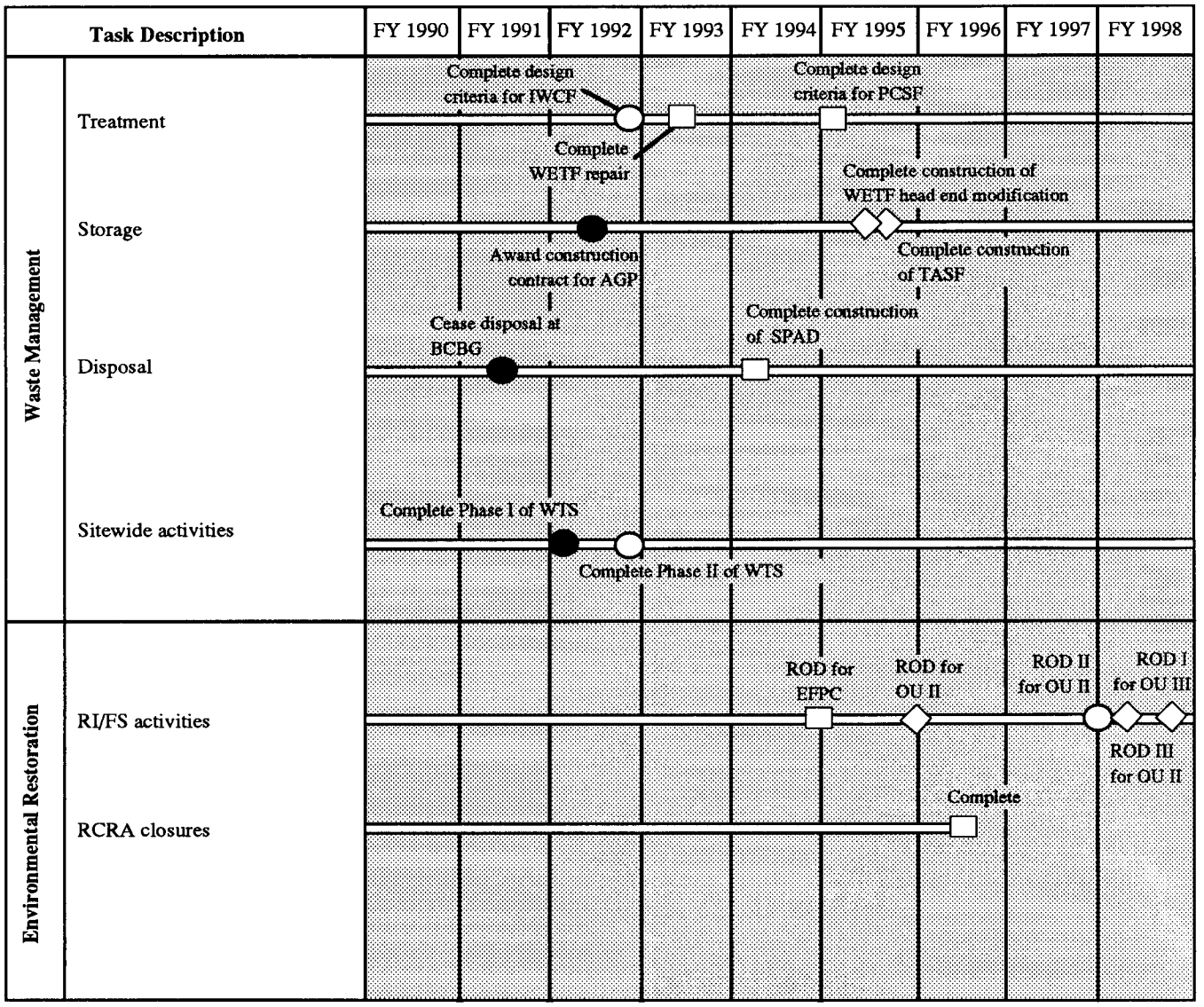
Technology Development

- Implemented solvent substitution at the Y-12 Plant, replacing chlorinated solvents to reduce human health and environmental hazards without sacrificing product quality.
- Cast U-2Nb (a uranium alloy) in a noncarbon furnace. The resulting scrap from the casting process can be recycled, unlike carbon-contaminated scrap.

OAK RIDGE FIELD OFFICE PROGRESS CHART Y-12 SITE

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.



Milestone Types	Milestone Status
○ Unchanged from FY 1993–1997 FYP	○ ◇ □ Planned
◇ New since FY 1993–1997 FYP	● ◆ ■ Complete
□ Changed from FY 1993–1997 FYP	50 percent complete
	Information flow

Notes and Acronyms

AGP-Above Grade Pads
BCBG-Bear Creek Burial Ground
EFPC-East Fork Poplar Creek
FYP- Five-Year Plan
IWCF-Industrial Waste Compaction Facility
OU-Operable Unit
PCSF-Packaging, Certification and Staging Facility
RI/FS-Remedial Investigation/Feasibility Study
ROD-Record of Decision
SPAD-Steam Plant Ash Disposal
TASF-TSCA Ash Storage Facility
TSCA-Toxic Substances Control Act
WETF-West End Treatment Facility
WTS-Waste Tracking System

MAJOR MILESTONES

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
Corrective Activities			
• Complete construction of the Steam Plant Ash Disposal Facility.	3Q FY 1993	1Q FY 1994	TN Rule 1200-1-7-04 TWQCA 69-3-108
Waste Management			
• Complete Phase II of Waste Tracking System.	New	4Q FY 1992	TN Rule 1200-1-11-05
• Complete construction of Classified Solid Waste Storage Facility.	New	2Q FY 1995	DOE Order 5820.2A
• Complete construction at the Toxic Substances Control Act (TSCA) Incinerator Ash Storage Facility.	New	3Q FY 1995	40 CFR 262.34
• Complete construction of sludge storage facility at the K-25 Site.	New	3Q FY 1995	40 CFR 262.34
• Complete construction of West End Treatment Facility head end modification.	New	3Q FY 1995	NPDES Permit TN 0002968
• Complete Plant drain rerouting project.	New	1Q FY 1997	NPDES Permit TN 0002968
• Initiate detailed design for Production Waste Treatment Facility.	New	1Q FY 1995	DOE Order 5820.2A
Environmental Restoration			
• Completed Alternate Concentration Limits demonstration for S-3 Ponds, BCBG/Oil Landfarm, and New Hope Pond.	4Q FY 1992	Eliminated[1]	
• Issue Record of Decision (ROD) for East Fork Poplar Creek.	4Q FY 1993	4Q FY 1994[2]	ORR FFA Sect. XIV
• Complete RCRA Closures.	4Q FY 1993	1Q FY 1997	40 CFR 264.112
• Issue ROD for Upper East Fork Poplar Creek (UEFPC) Group I Sites.	4Q FY 1996	Eliminated[3]	
• Issue ROD for UEFPC Group II Sites.	4Q FY 1997	Eliminated[3]	
• Complete Corrective Action Plan for S-3 Ponds, BCBG/Oil Landfarm and New Hope Pond.	New	3Q FY 1993[3]	ORR FFA Sect. XIV
• Issue ROD for Chestnut Ridge Filled Coal Ash Pond (OU 2).	New	1Q FY 1997[4]	ORR FFA Sect. XIV

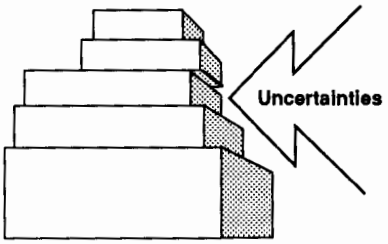
MAJOR MILESTONES (Continued)

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
• Issue ROD for Nitric Acid Pipeline (UEFPC OU 2).	New	4Q FY 1997[4]	ORR FFA Sect. XIV
• Issue ROD for Bear Creek Valley Spoil Areas (OU 2).	New	1Q FY 1998[4]	ORR FFA Sect. XIV
• Issue ROD for UEFPC Western Exclusion Area (OU 3).	New	3Q FY 1998[4]	ORR FFA Sect. XIV
Technology Development			
• Support investigation and demonstration of waste management and environmental restoration technologies	New	1Q FY 1995	DOE Management Initiative

[1]Eliminated because of anticipated modification of the FFA.
[2]Slipped because of anticipated modification of the FFA.
[3]Eliminated because of the redesignation of the Upper East Fork Poplar Creek waste sites into operable units.
[4]New activities resulted from the redesignation of waste sites into operable units.

CFR - *Code of Federal Regulations*
NPDES - National Pollutant Discharge Elimination System
ORR FFA - Oak Ridge Reservation Federal Facilities Agreement
TWQCA - Tennessee Water Quality Control Act

FIVE-YEAR PLAN ESTIMATES



There are a number of potential activities at the Oak Ridge Y-12 Plant that may affect program requirements. These potential activities have not been included in the estimates below due to various uncertainties regarding scope of work, the phasing of regulatory reviews and approval schedules, availability of technology, lack of independent cost reviews and other factors. If further analysis of these uncertainties and potential additional work results in additional funding needs based on legal requirements, DOE will, through mechanisms such as reallocating budgetary resources, requesting funds through the normal appropriation process, supplemental requests or internal reprogramming, pursue funding for these activities, or where appropriate, based on technical reasons, enter into the formal conflict resolution process with regulatory bodies.

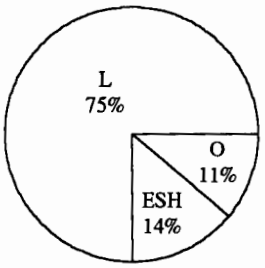
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Corrective Activities/Waste Management	74,582	62,064	54,306	58,673	64,344	70,582	72,159
Environmental Restoration	17,346	58,850	64,572	95,966	105,535	141,202	115,963
Facility Transition	0	0	2,000	2,000	2,200	2,500	2,550
Total	91,928	120,914	120,878	156,639	172,079	214,284	190,672

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites.

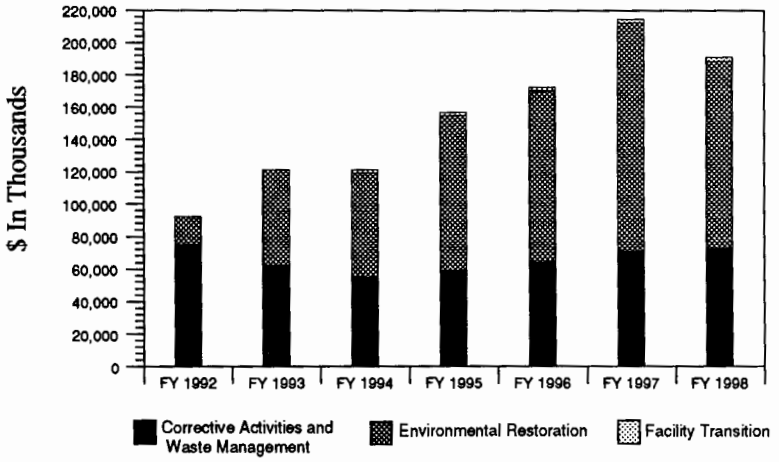
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



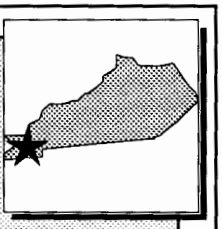
L- Legally Driven Requirements
ESH- Environment, Safety, and Health Requirements
O- Other Desirable Activities

Estimates by Year



For further information regarding the Oak Ridge Y-12 Plant, call (615) 576-1590.

OAK RIDGE FIELD OFFICE
INSTALLATION SUMMARY
PADUCAH GASEOUS DIFFUSION PLANT



DESCRIPTION

The principle on-site process at Paducah Gaseous Diffusion Plant (PGDP), located ten miles west of Paducah, Kentucky, is the separation of uranium isotopes through gaseous diffusion. The process produces enriched uranium used as fuel in commercial power plants. The site encompasses 750 acres (including 74 acres of process buildings). The site is included in a 3422-acre tract of DOE-owned property.

STRATEGIC OUTLOOK

The goal of the Waste Management Program is to manage wastes in a manner that is protective of human health and the environment; meets all regulatory requirements and DOE orders; allows production and production support activities to operate without significant adverse environmental impact; minimizes waste generation to the greatest extent possible; and is cost effective, while developing treatment and disposal options to reduce the current reliance on long-term storage of radioactively contaminated wastes.

PGDP remedial action activities were initiated in November 1988 to investigate and remediate the off-site groundwater contamination and all remaining Solid Waste Management Units/Areas of Concern. PGDP has both on-site and off-site contamination, primarily including uranium, polychlorinated biphenyls (PCBs), technetium, and trichloroethylene. PGDP environmental restoration activities are divided into four major sections: Remedial Actions, Management Services, Decontamination and Decommissioning (D&D), and Hydrogeologic Services. The PGDP environmental restoration activities investigate and remediate the site under three regulatory agreements and/or permits. The off-site groundwater contamination is being investigated under an Administrative Consent Order with the EPA under CERCLA Sections 104 and 106. The investigation and remediation of PGDP Solid Waste Management Units/Areas of Concern are being conducted under a Kentucky RCRA permit and an EPA Hazardous and Solid Waste Amendment (HSWA) Permit, which became effective in August 1991. An Agreement-in-Principle between DOE and the State of Kentucky for the oversight of PGDP environmental restoration activities and environmental monitoring programs became effective in May 1991. PGDP is expecting to be added to the EPA's National Priorities List in FY 1993, after which, negotiation will be initiated on a Federal Facilities Agreement (FFA). The D&D Program has been initiated for the C-340 Uranium Reduction Facilities, which is partially driven by a Toxic Substances Control Act (TSCA) Federal Facility Compliance Agreement.

Interim measures such as installing troughs under motor gasket flanges to capture gasket drips, and inspection and cleanup of leaking potential devices continue under the TSCA Federal Facility Compliance Agreement.

The present plans for PGDP call for completion of all investigations of known SWMUs/AOCs in FY 1996 with completion of remediation activities by FY 2015. D&D planning for PGDP has been initiated for one shutdown uranium processing facility. PGDP is expected to be completely shut down around FY 2015. Completion of the D&D at PGDP is scheduled for FY 2030. Long-term surveillance, maintenance, and institutional controls will continue indefinitely.

ACCOMPLISHMENTS (FY 1991 – 3Q FY 1992)

Waste Management

- Upgrading, replacing, and/or adding dikes around tank and container storage facilities is required to provide containment in the event of a spill. Design occurred in FY 1992 with construction planned to begin in FY 1993.
- As of June 1992, over 1470 requests for disposal from the generator had been processed, and the waste either disposed of in the landfill or at the TSCA incinerator or placed in storage facilities.
- As of July 20, 1992, over 86,000 pounds of liquid RCRA/TSCA/low-level waste was shipped to the TSCA incinerator at the K-25 Site for disposal.
- Three Federal Facility Compliance Agreements (FFCAs) were signed this year.
  - The Toxic Substances Control Act (TSCA) FFCA was effective February 20, 1992, and addresses, among other issues, radioactively contaminated TSCA waste that has been in storage longer than the one year requirement.
  - The Toxicity Characteristic Leaching Procedure (TCLP) FFCA, effective April 3, 1992, provides an extended time frame for either documenting process knowledge or performing TCLP analyses for drums that were in the backlog as of September 1990, when the TCLP replaced the EP toxicity test for determining RCRA status.
  - The Land Disposal Restricted (LDR) FFCA, effective July 1, 1992, addresses radioactively contaminated LDR wastes that exceed the one year storage requirement.
- Additional TSCA storage was obtained by transferring ownership of the C-746-B warehouse from Stores and Maintenance to Waste Management.
- In accordance with new state solid waste operations, the inert landfill ceased operation on June 30, 1992, and actions needed to cap the landfill are under way.
- In accordance with new state solid waste operations, the residential landfill was upgraded to meet transitional standards by June 30, 1992, so that operations can continue.
- Ongoing actions have been intensified with Hanford to complete the waste certification process for at least one waste stream. Certification and shipment of a pilot waste stream is expected to be completed by FY 1993.
- Certification procedures for off-site waste shipments for selected waste streams have been submitted to the Martin Marietta Energy Systems Inc., (MMES) Readiness Review Board for either MMES approval or submittal to DOE for approval. Development of additional procedures is under way. Resumption of off-site waste shipments is critical to easing the storage shortage at PGDP.
- Staffing of critical positions within Waste Management has begun, including a Waste Minimization coordinator, the TCLP FFCA coordinator, additional waste stream coordinators, field inspectors, and staffing of a second shift for waste movement.
- Preliminary engineering and NEPA actions needed to construct two TSCA GPP storage facilities are under way. These facilities are needed to "bridge the gap" between the time when all existing RCRA and TSCA storage facilities are projected to be at capacity and when the Mixed Waste Storage Facility is completed.

ACCOMPLISHMENTS (Continued)

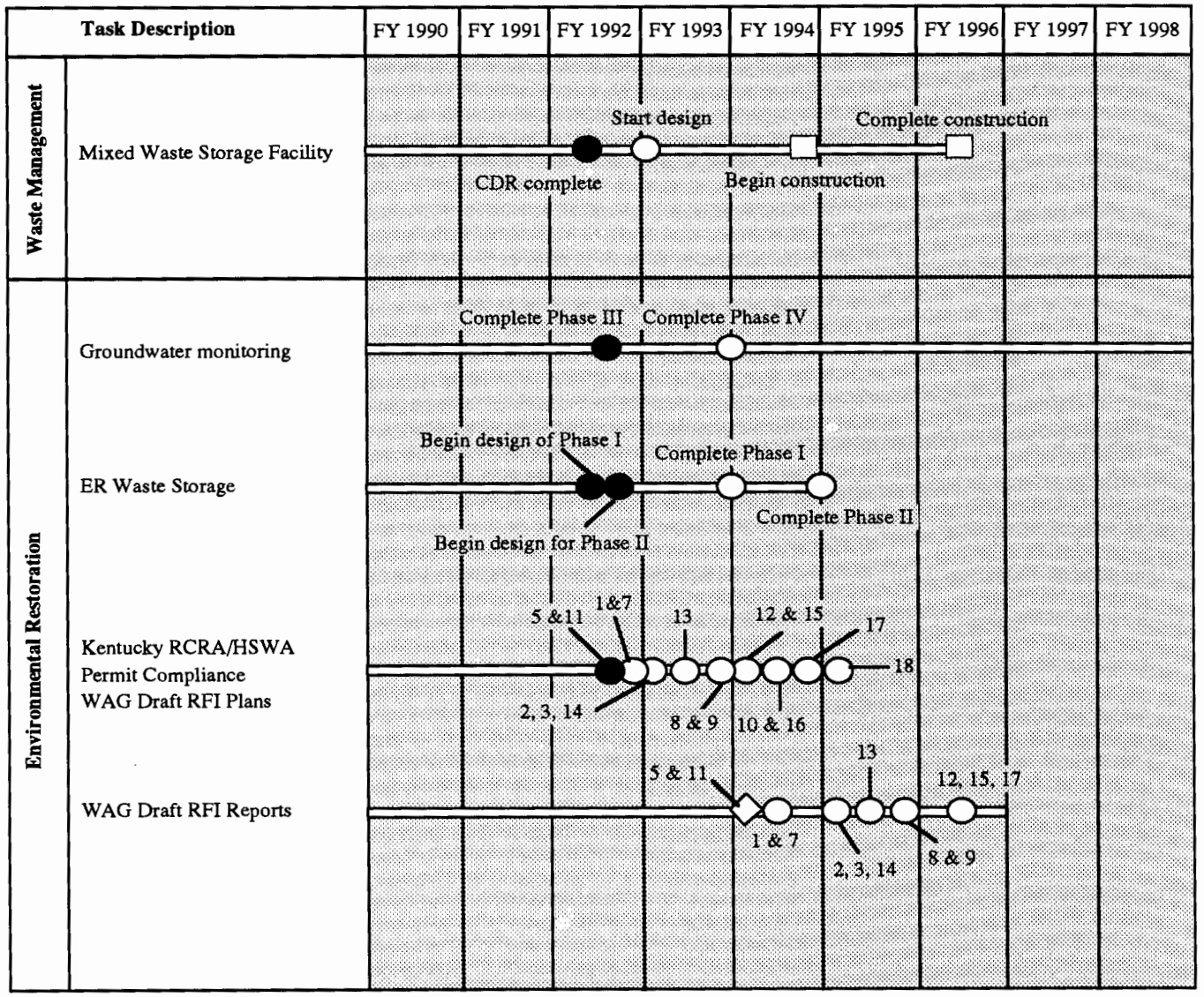
Environmental Restoration

- Part B Kentucky RCRA/HSWA Permit become effective August 19, 1991.
- Initiated implementation and maintenance of PGDP environmental restoration activities Administrative Record for the Administrative Consent Order site investigation for groundwater contamination.
- Held initial coordination meeting with the State of Kentucky for the implementation of the Kentucky AIP. Completed all short-term DOE deliverables in support of the Agreement-in-Principle.
- Completed system requirement document for the AR/ER Building.
- Completed engineering design for Waste Holding Facilities.
- Phase I Report on Site Investigation for Groundwater Contamination was considered "exceptional" by EPA and approved as final.
- Completed Phase II fieldwork and issued revised draft report on the Site Investigation for Groundwater Contamination to EPA and the State of Kentucky for approval.
- The drafts of Phase II Public Health and Ecological Assessment and Summary of Alternatives for Remedial Actions were completed and submitted to EPA, the State of Kentucky, and the public for comments.
- Completed construction for Groundwater Monitoring Phase 3. The project was designed to supplement previous environmental restoration activities projects and to provide additional characterization of site geology and hydrogeology. Draft report was issued in 3Q FY 1992.
- Completed the removal of two 10,000-gallon leaking petroleum underground storage tanks (USTs).
- Completed the C-750 area USTs Site Investigation.
- Negotiated conditions of HSWA Permit; HSWA permit became effective August 19, 1991 along with the Kentucky RCRA permit.
- Issued draft RCRA Facility Investigation (RFI) Report, addressing Waste Area Groupings 5 and 11, to EPA and the State of Kentucky in 3Q FY 1992.
- Administrative Consent Order requirements have been completed.
- Negotiated conditions of TSCA Federal Facilities Agreement. Effective date was February 20, 1992.

OAK RIDGE FIELD OFFICE
PROGRESS CHART
PADUCAH GASEOUS DIFFUSION PLANT

Long-Term Objectives
Complete all the corrective measures required at PGDP.

Five-Year Objectives
Complete all the investigations and alternatives analyses at PGDP.



Milestone Types	Milestone Status
○ Unchanged from FY 1993-1997 FYP	○ ◇ □ Planned
◇ New since FY 1993-1997 FYP	● ◆ ■ Complete
□ Changed from FY 1993-1997 FYP	50% complete
	Information flow

Notes and Acronyms

CDR-Conceptual Design Report
ER-Environmental Restoration
FYP-Five-Year Plan
HSWA-Hazardous and Solid Waste Amendments
RFI-RCRA Facility Investigation
WAG-Waste Area Group

MAJOR MILESTONES

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Drivers
Waste Management			
• Complete design of Mixed Waste Storage Facility (MWSF) line item project (LIP).	New	1Q FY 1994	RCRA/TSCA
• Begin construction of MWSF LIP.	New	4Q FY 1994	RCRA/TSCA
• Complete construction of MWSF LIP.	4Q FY 1994	3Q FY 1996[1]	RCRA/TSCA
• Start design on the solid waste landfill LIP.	New	1Q FY 1993	State solid waste regs
• Begin construction of solid waste landfill LIP.	New	2Q FY 1994	State solid waste regs
• Complete construction of solid waste landfill.	New	4Q FY 1995	State solid waste regs
• Complete construction of TSCA GPP storage facility.	New	4Q FY 1993	TSCA
• Waste Management's staffing level reaches 60 full-time employees.	New	4Q FY 1993	RCRA/TSCA
Environmental Restoration			
• Complete construction of off-site decontamination pad.	4Q FY 1993	1Q FY 1994	ACO
• Complete construction of ER Waste Storage Phase I.	4Q FY 1994	1Q FY 1994[2]	ACO
• Complete construction of contractor staging area.	New	2Q FY 1994[2]	ACO
• Complete construction of waste storage Phase II.	4Q FY 1994	4Q FY 1994[2]	ACO
• Complete construction of ER office facility.	New	1Q FY 1995[2]	ACO
• Complete construction of Mixed Waste Storage Facility.	4Q FY 1994	2Q FY 1995[2]	ACO
• Submit Draft RFI Plan for WAGs 1 & 7 as required by Kentucky RCRA/HSWA Permit.	4Q FY 1994	4Q FY 1992[2]	RCRA Sect. 3004(u), (v)
• Submit Draft RFI Plan for WAG 13 as required by Kentucky RCRA/HSWA Permit.	4Q FY 1994	2Q FY 1994[2]	RCRA Sect. 3004(u), (v)

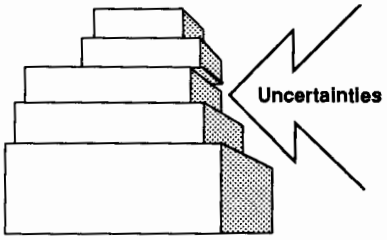
MAJOR MILESTONES (Continued)

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Drivers
• Submit Draft RFI Plan for WAGs 8 and 9 as required by Kentucky RCRA/HSWA Permit.	4Q FY 1994	3Q FY 1993[2]	RCRA Sect. 3004(u), (v)
• Submit Draft RFI Plan for WAGs 12 and 15 as required by Kentucky RCRA/HSWA Permit.	4Q FY 1994	4Q FY 1993[2]	RCRA Sect. 3004(u), (v)
• Submit Draft RFI Plan for WAGs 10 and 16 as required by Kentucky RCRA/HSWA Permit.	4Q FY 1994	1Q FY 1994	RCRA Sect. 3004(u), (v)
• Submit Draft RFI Plan for WAG 17 as required by Kentucky RCRA/HSWA Permit.	4Q FY 1994	2Q FY 1994[2]	RCRA Sect. 3004(u), (v)
• Submit Draft RFI Plan for WAG 18 as required by Kentucky RCRA/HSWA Permit.	4Q FY 1994	3Q FY 1994[2]	RCRA Sect. 3004(u), (v)
• Complete engineering design for well abandonment.	4Q FY 1991	4Q FY 1992[2]	ACO
• Complete construction of groundwater monitoring Phase 4.	4Q FY 1991	4Q FY 1993[2]	ACO
• Submit report to regulators, which is required as part of UST Investigation.	New	4Q FY 1992	RCRA Subpart I
• Submit Corrective Action Plan for UST to regulators.	New	2Q FY 1993	RCRA Subpart I
• Submit Draft RFI Plan for WAGs 2, 3, & 14 as required by Kentucky RCRA/HSWA Permit.	4Q FY 1994	1Q FY 1993[2]	RCRA Sect. 3004(u), (v)
• Issue Facility Surveillance and Maintenance Plan.	New	4Q FY 1992	DOE Order 5403.11, 5400.1, 5400.6
• Issue documentation for Decommissioning and Decontamination Project (C-340).	New	4Q FY 1992	FFCA

[1]Slipped because of reprioritization of project.
[2]Redefined schedule to reflect specific milestones and increased level of detail.

ACO - Administrative Consent Order
FFCA - Federal Facility Compliance Agreement
TSCA - Toxic Substances Control Act

FIVE-YEAR PLAN ESTIMATES



There are a number of potential activities at the Paducah Gaseous Diffusion Plant (PGDP) that may affect program requirements. These potential activities have not been included in the estimates below due to various uncertainties regarding scope of work, the phasing of regulatory reviews and approval schedules, availability of technology, lack of independent cost reviews and other factors. If further analysis of these uncertainties and potential additional work results in additional funding needs based on legal requirements, DOE will, through mechanisms such as reallocating budgetary resources, requesting funds through the normal appropriation process, supplemental requests or internal reprogramming, pursue funding for these activities, or where appropriate, based on technical reasons, enter into the formal conflict resolution process with regulatory bodies.

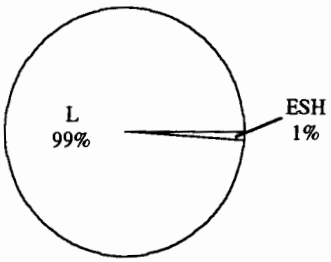
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Environmental Restoration	9,396	26,990	49,377	26,836	28,462	27,729	38,305
Total	9,396	26,990	49,377	26,836	28,462	27,729	38,305

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites. Only EM-funded and EM-managed activities are included.

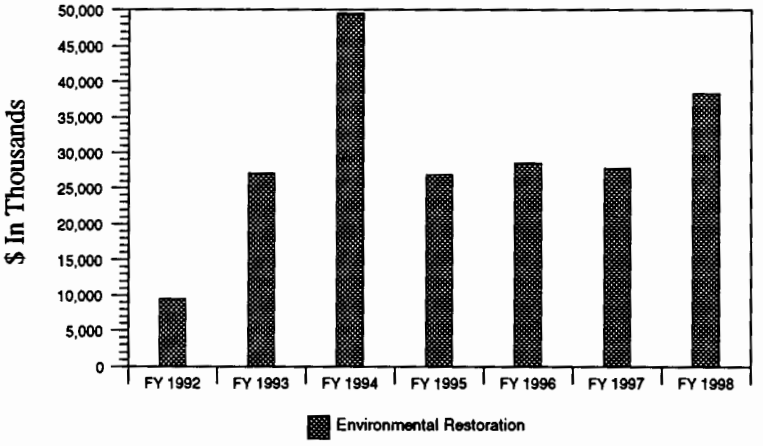
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



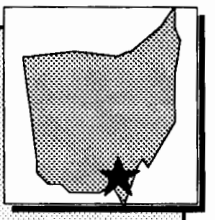
L- Legally Driven Requirements
ESH- Environment, Safety, and Health Requirements

Estimates by Year



For further information regarding Paducah Gaseous Diffusion Plant, call (615) 576-1590.

OAK RIDGE FIELD OFFICE
INSTALLATION SUMMARY
PORTSMOUTH GASEOUS DIFFUSION PLANT



DESCRIPTION

The Portsmouth Gaseous Diffusion Plant (PORTS) site covers 3700 acres, including 93 acres for the process buildings, and is approximately 20 miles north of Portsmouth and 70 miles south of Columbus, Ohio. The principal on-site process at PORTS is the separation of uranium isotopes through gaseous diffusion. This process produces enriched uranium, which is used as fuel in commercial power plants.

Environmental problems at the Portsmouth Plant involve mostly solvent contamination of the aquifer beneath the site. Solvents were used for industrial metal cleaning required to maintain the facility during operations. Plumes of groundwater contaminated with solvents extend from several locations within the plant. In addition, two locations were characterized to be contaminated with hexavalent chromium used as an anticorrosive in the plant cooling water systems.

STRATEGIC OUTLOOK

The major elements of the waste management strategy are to expand on-site treatment capability for mixed, Toxic Substances Control Act/Radioactive (TSCA/RAD) and RCRA/TSCA/RAD wastes; ship as much waste as practicable to the K-25 TSCA Incinerator and approved commerical treatment and disposal facilities; and as a last resort build additional mixed waste storage facilities.

Environmental restoration activities have been initiated at the site to assess and clean up environmental contamination and to perform decontamination and decommissioning (D&D) of inactive/surplus facilities. These objectives will be realized through implementation of a RCRA Facility Investigation (RFI) to identify and characterize any environmental contamination, a Corrective Measures Study (CMS) directed at identifying the most cost-effective cleanup alternatives, and a Corrective Measures Implementation (CMI) phase during which previously identified problem areas are cleaned up using methods identified during the CMS. Approximately 87 solid waste management units have been identified that have handled RCRA wastes. These units are the primary targets for investigation. Surface impoundments, landfills, spoils areas, treatment facilities, and holding ponds that are operational are being managed in accordance with all applicable regulations.

This process is mandated by agreements among DOE, EPA, and the State of Ohio. The requirements and time schedule for completion of this plan are contained in an Administrative Consent Order with EPA, and in a Judicial Consent Decree with the State of Ohio.

The agreements with EPA and the State of Ohio divide the site into quadrants based on groundwater flow. Each quadrant is to be treated independently and progress separately through the RFI/CMS process. The site has completed the RFI for two of the quadrants, with the fieldwork for the third scheduled for completion in FY 1992–1993. The fourth quadrant is due to be completed in FY 1994. CMS activities are currently under way for Quadrants I and II with design and construction associated with the CMI for these quadrants scheduled to begin in FY 1994. Quadrants III and IV CMS activities are scheduled to be completed in FY 1994 and FY 1995, respectively.

STRATEGIC OUTLOOK (Continued)

Design and construction of the selected and approved corrective measures for these quadrants will be initiated concurrently with the final phases of the CMS to meet regulatory requirements. All remediation is now scheduled for completion by the end of FY 1999.

In addition to the RFI/CMS process currently under way, five solid waste management units were identified for immediate closure under provisions of RCRA by the State of Ohio. These are X-616 Chromium Sludge Lagoons, X-749 Contaminated Materials Disposal Facility, X-231B Oil Biodegradation Plot, X-701B Holding Pond, and X-749A Classified Materials Disposal Facility. To date, construction on the remedial measures employed at X-616 have been completed and are awaiting certification. Construction at X-749 is nearing completion. X-231B is the subject of a remedial technology demonstration project that is scheduled for completion in June 1992. The goal of this project is to identify promising cost-effective technologies that may be used to close X-231B, X-701B, and other units both on the Portsmouth reservation and elsewhere. Of the remaining units, migration of a plume of groundwater contamination emanating from X-701B was stopped by construction of an interceptor trench. Design of activities to support remediation of X-749A is scheduled for completion by the end of FY 1993.

All underground and aboveground storage tanks are being brought up to current standards in accordance with relevant regulatory requirements. Several underground tanks have been removed with an additional three slated for removal in FY 1994. Aboveground storage tank areas must be diked properly and spill areas cleaned up to regulatory standards. Aboveground storage tanks will be addressed commencing in FY 1994.

In late 1991, eight additional sites requiring immediate closure and cleanup were identified at the site. Plans for closure of these units are being submitted for regulatory review in FY 1992. Remedial action is scheduled to commence in FY 1992 as well.

At the conclusion of remedial construction, long-term surveillance and monitoring of applied corrective measures will begin. This phase will consist of routine maintenance to any constructed facilities as well as periodic sampling to ensure that selected corrective measures have restored the environmental integrity of the site.

ACCOMPLISHMENTS (FY 1991 – 3Q FY 1992)

Waste Management

- Reduced volume of waste by 40% in the first half of FY 1992 as compared to the first half of FY 1991. Reductions in specific waste streams include: Radioactive Waste–38%, RCRA Mixed Waste–15%, PCB Mixed Waste–63%, Sanitary Waste–60%.
- Issued a PORTS Waste Management Strategic Plan in March 1992.
- Issued a PORTS Waste Minimization Plan in November 1991.
- Implemented a Waste Tracking System using bar code technology. Inventoried and labeled over 21,000 containers with bar codes.
- Treated 42,000 gallons of hazardous wastewater in the first half of FY 1992. This freed about 6000 square feet of waste storage space.
- Relocated 3000 drums of hazardous waste to building X-7725 into areas that meet RCRA Part B Interim Status Requirements.

ACCOMPLISHMENTS (Continued)

Environmental Restoration

- Completed an accumulated waste characterization work plan in January 1992 that summarizes the specific requirements to sample and characterize accumulated waste.
- Received conditional approval of the Work Plans for Quadrants I and II from EPA and the Ohio EPA.
- Received conditional approval from EPA and the Ohio EPA and initiated fieldwork on Quadrant III.
- The X-231B Biodegradation Plot Closure Plan and Closure Option Study received approval from Ohio EPA for a technology demonstration for soil remediation. Initiated construction of a groundwater pump-and-treatment facility.
- Received approval from Ohio EPA on the X-616 Surface Impoundments Closure Plan for removal of the treatment of sludge from X-616 and placement in the X-735 Landfill. Constructed monocells and filled and initiated closure in accordance with an approved Permit to Install. Completed the X-616 Closure.
- Submitted the X-701B Holding Ponds Closure Plan and received approval from the Ohio EPA. Completed sludge removal, treatment, dewatering, and boxing. Initiated design for the groundwater extraction system, water treatment facility, and multilayer cap. Submitted Closure Option Study to Ohio EPA.
- Constructed a groundwater intercept trench and installed a temporary groundwater treatment facility to intercept the contaminant plumes from the X-701B Holding Pond. Completed construction of a second intercept.
- Submitted the X-749A Classified Burial Grounds Closure Plan to Ohio EPA.
- Submitted the X-749 Contaminated Materials Disposal Facility (Northern Portion) Closure Plan and Closure Option Study and received approval from Ohio EPA. Installed slurry wall and subsurface drains and piped contaminated groundwater to a temporary groundwater treatment facility. Modeled cap construction with test pads and initiated multilayer cap construction.
- Removed four underground storage tanks, sampled, and characterized sites. Removed contaminated soils to below method detection limits or background levels.
- Submitted Closure Plans to the Ohio EPA for approval as follows: X-701C, X-750 Waste Oil Tank, X-740 Hazardous Waste Storage Tank, X-740 Waste Oil Storage Facility, X-752 Hazardous Waste Storage Facility, X-744G(U) Unrestricted Hazardous Waste Storage Facility, X-744G(R) Restricted Hazardous Waste Storage Facility, X-735 Landfill, and the X-744Y Mixed Waste Storage Yard.
- Completed field trials for the X-231B Technical Demonstration Project.
- Certified the closure of the X-235 Landfill.
- Proposed and received concurrence from the state on a two-phase risk assessment study for the RFI Program
- Completed closure of X-749 (northern portion) and submitted the closure certification report.
- Submitted revised closure options studies for the X-701B and X-231B units based on assessment results from the X-231B technical demonstration project.
- Completed the Quadrant I and II RFI activities and submitted reports to EPA and the State of Ohio.

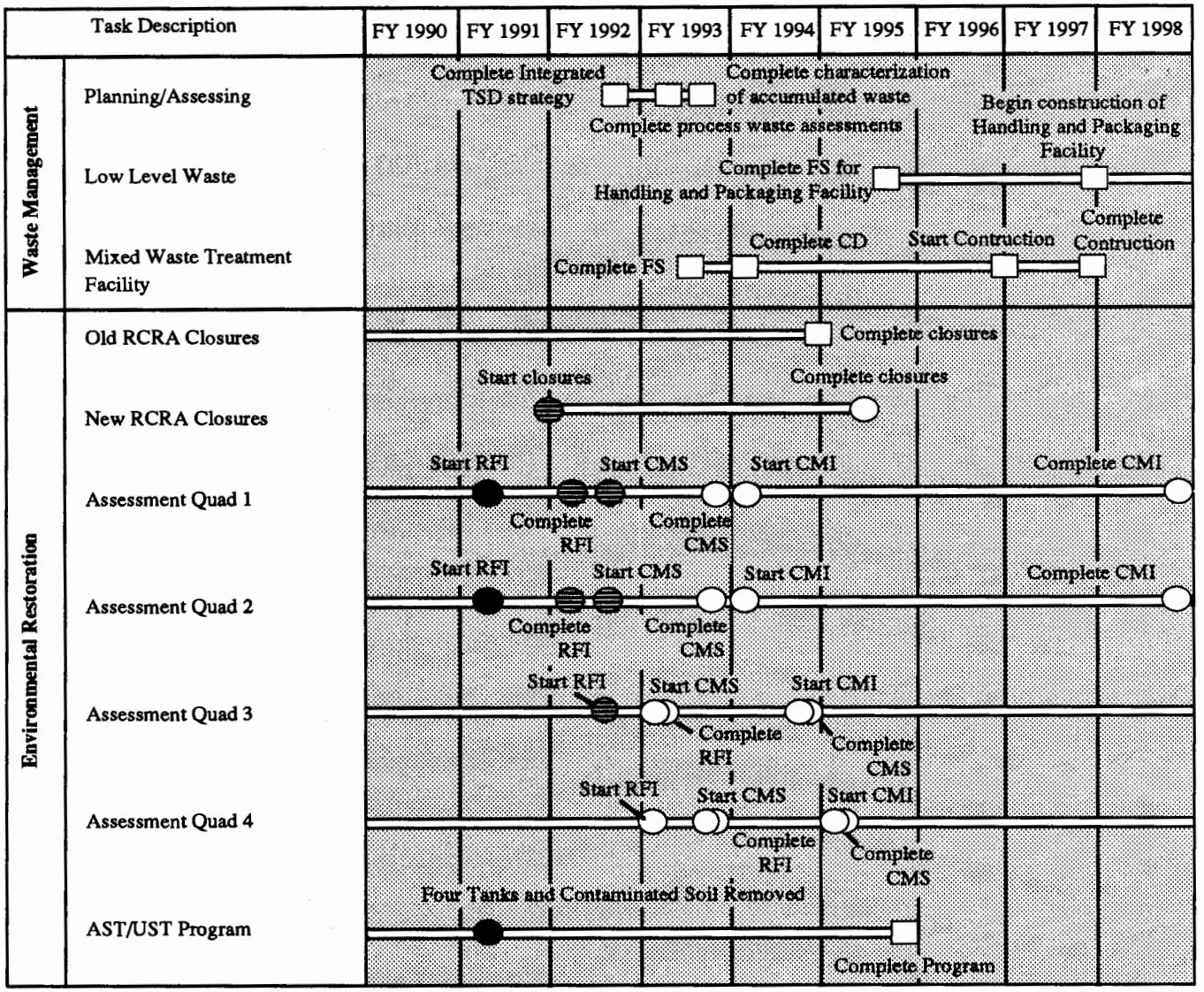
OAK RIDGE FIELD OFFICE
PROGRESS CHART
PORTSMOUTH GASEOUS DIFFUSION PLANT

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.



Milestone Types	Milestone Status
○ Unchanged from FY 1993-1997 FYP	○ ◇ □ Planned
◇ New since FY 1993-1997 FYP	● ◆ ■ Complete
□ Changed from FY 1993-1997 FYP	50% complete
	- - - → Information flow

Notes and Acronyms

AST-aboveground storage tank
CD-Conceptual Design
CMS-Corrective Measures Study
CMI-Corrective Measures Implementation
FS-Feasibility Study
FYP-Five-Year Plan
IRM-Interim Remedial Measures
RFI-RCRA Facility Investigation
UST-underground storage tank

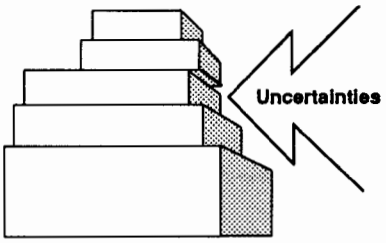
MAJOR MILESTONES

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
Waste Management			
• Complete Upgrades to Building X-7725.	4Q FY 1991	2Q FY 1993	40 CFR 264
• Complete Process Waste Assessments.	New	2Q FY 1993	FFCA
• Complete Characterization of Accumulated Waste.	New	3Q FY 1993	40 CFR 261
• Complete Feasibility Study Report for Mixed Waste Treatment Facility.	New	3Q FY 1993	40 CFR 268
• Complete Conceptual Design Report for Mixed Waste Treatment Facility.	New	2Q FY 1994	40 CFR 268
• Complete Feasibility Study Report for Low-Level Waste Handling and Packaging Facility.	New	3Q FY 1995	DOE Order 5820.2A
• Start Construction of Mixed Waste Treatment Facility.	New	1Q FY 1997	40 CFR 268
• Start Construction of Low-Level Waste Packaging and Certification Facility.	New	1Q FY 1998	DOE Order 5820.2A
• Complete Construction of Mixed Waste Treatment Facility.	New	1Q FY 1998	40 CFR 268
• Complete Construction of Low-Level Waste Packaging and Certification Facility.	New	1Q FY 2002	DOE Order 5820.2A
Environmental Restoration			
• Complete Well 6B Interim Remedial Measure.	FY 1991	2Q FY 1993[1]	EPA ACO Sect. IX(c)
• Complete closure, X-616 Chromium Sludge Lagoon.	FY 1992	4Q FY 1994[2]	Ohio Consent Decree
• Complete demolition of X-326 old High Assay Storage Area.	FY 1992	4Q FY 1994[3]	RCRA Sect. 3004(u)
• Complete CMS for Quadrants I and II.	FY 1993	4Q FY 1993[3]	EPA ACO
• Complete Gas Centrifuge Enrichment Plant equipment removal.	FY 1993	4Q FY 1995[3]	DOE Order 5820.1A
• Complete demolition of X-705A radiator.	FY 1994	4Q FY 1994	RCRA Sect. 3004(u)
• Complete CMI Program Plan and Quadrant-specific CMI work plans.	FY 1994	4Q FY 1994	EPA ACO
• Complete Plugging and Abandonment (P&A) of Legacy Wells.	FY 1995	Eliminated[4]	
• Complete aboveground storage tank remediation.	FY 1995	4Q FY 1995	Ohio Consent Decree
• Complete RCRA closures.	FY 1995	2Q FY 1995[5]	40 CFR 264.112 40 CFR 264.112

[1]Slippage resulted from delay in NEPA approval.
[2]Slippage pending Ohio EPA approval of Closure Work Plans.
[3]Slippage resulted from reprioritization of projects.
[4]Eliminated P&A of Legacy Wells. This is a level of effort activity and will continue indefinitely.
[5]New closures identified by Ohio EPA.

CFR-*Code of Federal Regulations*
EPA ACO - EPA Administrative Consent Order
FFCA-Federal Facility Compliance Agreement

FIVE-YEAR PLAN ESTIMATES



There are a number of potential activities at Portsmouth Gaseous Diffusion Plant (PORTS) that may affect program requirements. These potential activities have not been included in the estimates below due to various uncertainties regarding scope of work, the phasing of regulatory reviews and approval schedules, availability of technology, lack of independent cost reviews and other factors. If further analysis of these uncertainties and potential additional work results in additional funding needs based on legal requirements, DOE will, through mechanisms such as reallocating budgetary resources, requesting funds through the normal appropriation process, supplemental requests or internal reprogramming, pursue funding for these activities, or where appropriate, based on technical reasons, enter into the formal conflict resolution process with regulatory bodies.

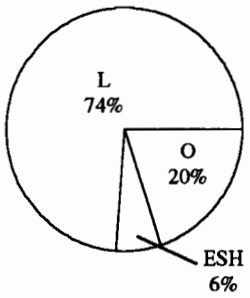
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Environmental Restoration	27,888	28,033	34,485	32,738	33,285	32,495	30,290
Total	27,888	28,033	34,485	32,738	33,285	32,495	30,290

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites. Only EM-funded and EM-managed activities are included.

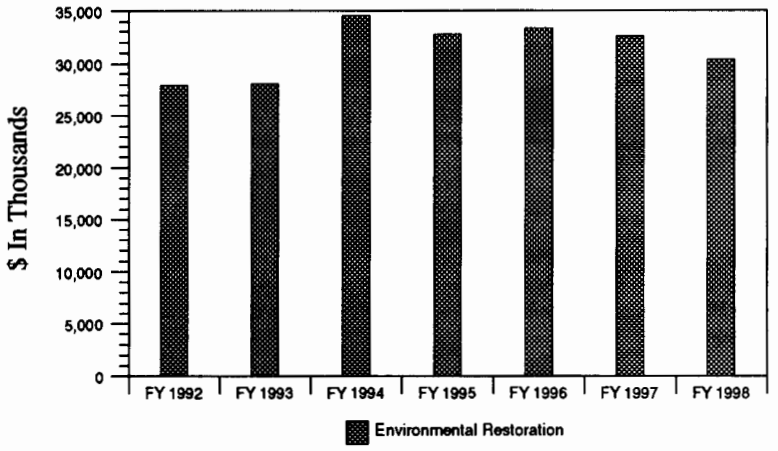
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



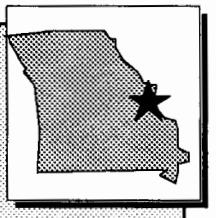
L- Legally Driven Requirements
ESH- Environment, Safety, and Health Requirements
O- Other Desirable Activities

Estimates by Year



For further information regarding Portsmouth Gaseous Diffusion Plant, call (615) 576-1590.

OAK RIDGE FIELD OFFICE
INSTALLATION SUMMARY
WELDON SPRING SITE



DESCRIPTION

The Weldon Spring Site, a 229-acre site located about 30 miles west of St. Louis, Missouri, was used by the Army as an ordnance works in the 1940s. In the 1950s and 1960s, the Atomic Energy Commission used Weldon Spring for processing uranium and thorium. The site is on the EPA National Priorities List, and DOE is conducting a comprehensive remedial action program, including long-term management of radiological wastes.

STRATEGIC OUTLOOK

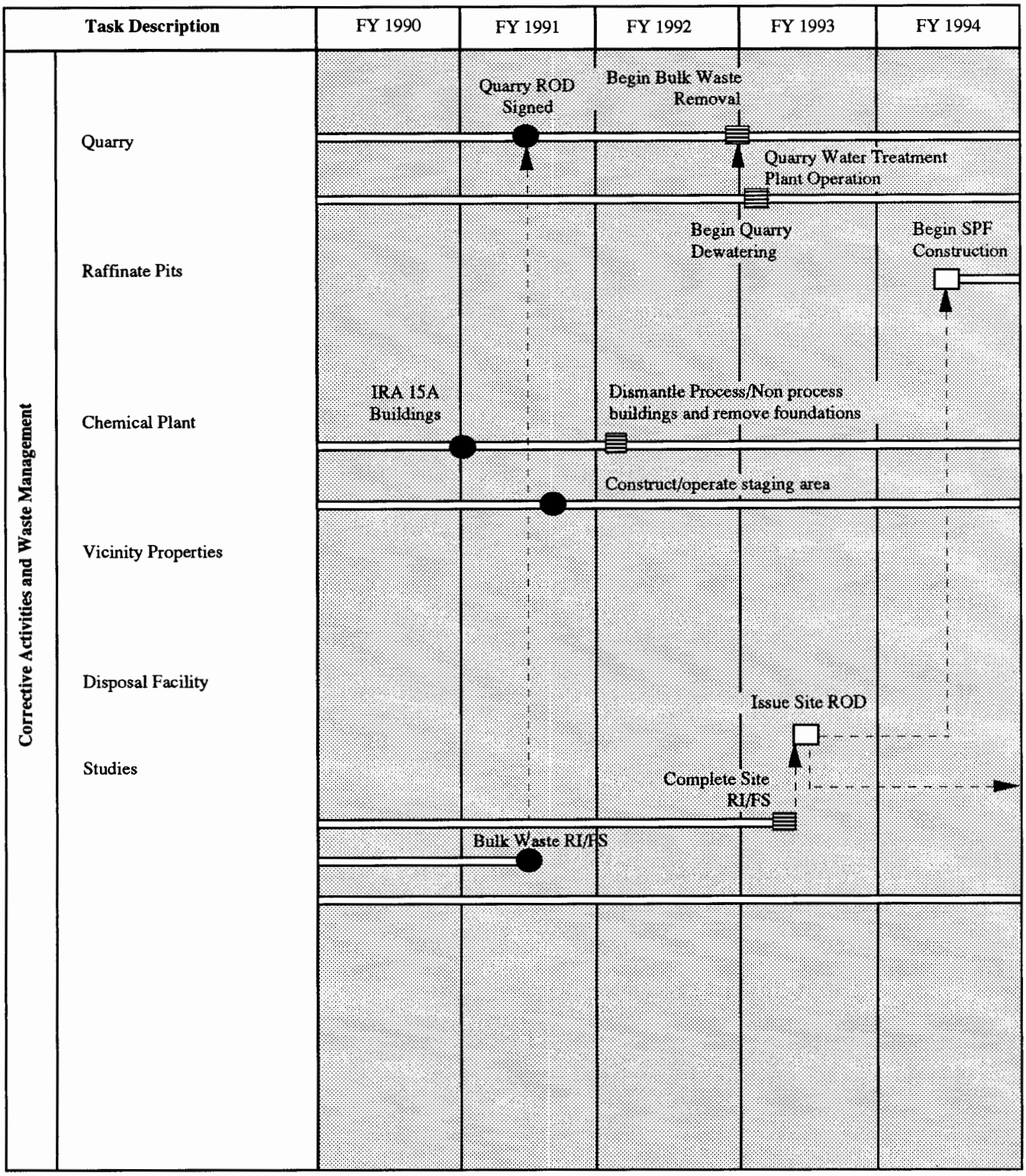
The mission of the Weldon Spring Site Remedial Action Project (WSSRAP) is to eliminate potential hazards to the public and environment and to make surplus real property available for other uses to the extent practicable. This mission will be accomplished by conducting remedial actions that will place the four areas described below in a radiologically and chemically safe condition in accordance with applicable DOE Guidelines and Federal, State, and local regulations. The areas to be remediated are (1) Quarry–nine-acre site containing 126,630 cubic yards of radiologically contaminated soil and rubble and three million gallons of radiologically and chemically contaminated water, (2) Raffinate Pits–four waste lagoons, containing 407,930 cubic yards of raffinate sludges/soil and 57 million gallons of radiologically or chemically contaminated water, (3) Chemical Plant–44 buildings and other structures and 347,996 cubic yards of contaminated soil and building material, and (4) Vicinity Properties–approximately 125,250 cubic yards of contaminated soil. The primary regulations that affect the site are CERCLA Superfund Amendments and Reauthorization Act (SARA), National Environmental Policy Act (NEPA), and RCRA. The WSSRAP site is on the EPA National Priorities List. The Remedial Investigation/Feasibility Study (RI/FS) required by CERCLA/SARA and the Environmental Impact Statement (EIS) required by NEPA will be integrated into a single document that will be fully reviewed by EPA and the State of Missouri. An amended Federal Facilities Agreement (FFA) has been negotiated and approved by EPA.

ACCOMPLISHMENTS (FY 1991 – 3Q FY 1992)

Environmental Restoration

- Record of Decision (ROD) for Quarry Bulk Waste Removal was signed by EPA and DOE.
- Five buildings were dismantled.
- Completed the Material Staging Area, Phase I.
- Haul road for quarry bulk waste removal was completed.
- Construction began for water treatment plants at the Quarry and Chemical Plant.

OAK RIDGE FIELD OFFICE PROGRESS CHART WELDON SPRING SITE



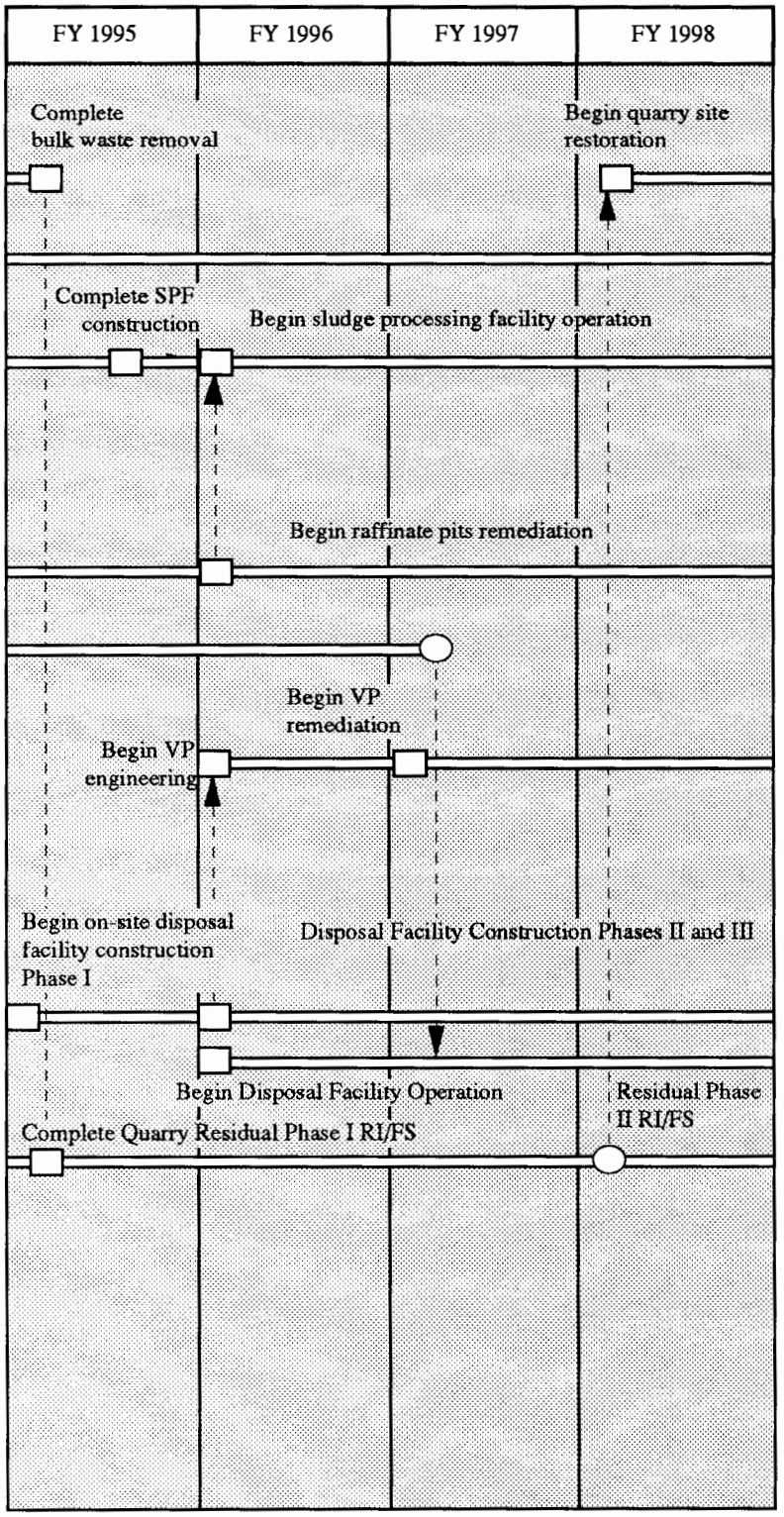
WELDON SPRING SITE REMEDIAL ACTION PROJECT

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.



Milestone Types

- Unchanged from FY 1993–1997 FYP
- New since FY 1993–1997 FYP
- Changed from FY 1993–1997 FYP

Milestone Status

- Planned
- Complete
- 50 percent complete
- Information flow

Notes and Acronyms

Milestone slippages are due either to a schedule slip in the site RI/FS activities or the May 15, 1991, rebaseline of the project.

FYP -Five-Year Plan
IRA -Interim Remedial Action
RI/FS -Remedial Investigation/Feasibility Study
ROD -Record of Decision
SPF -Sludge Processing Facility
VP -Vicinity Properties

MAJOR MILESTONES

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
• Begin Site Water Treatment Plant Operation.	2Q FY 1992	1Q FY 1993[1]	CERCLA, Sect. 120, 104
• Begin Quarry Bulk Waste Removal.	4Q FY 1992	4Q FY 1992	CERCLA, Sect. 120, 104
• Issue Site Record of Decision.	4Q FY 1992	3Q FY 1993[2]	CERCLA, Sect. 120, 121, 104
• Complete Quarry Bulk Waste Removal.	1Q FY 1995	1Q FY 1995	CERCLA, Sect. 120, 104
• Begin Disposal Facility Operation.	2Q FY 1995	1Q FY 1996[2]	CERCLA, Sect. 120, 109, 121
• Complete Vicinity Properties Remedial Action.	2Q FY 1996	1Q FY 1997[2]	CERCLA Sect. 120, 104, 121
• Issue Quarry Residual Record of Decision.	1Q FY 1997	2Q FY 1998[3]	CERCLA, Sect. 120, 104, 121
• Complete Chemical Plant Building Dismantlement.	4Q FY 1997	4Q FY 1994[4]	CERCLA, Sect. 120, 104

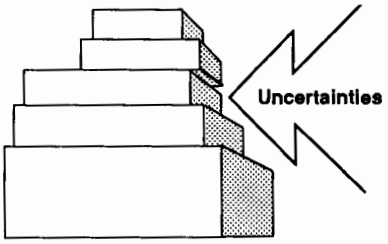
[1]Delays resulted from revisions to performance specifications and contract readvertisement.

[2]Delays in the completion of the RI/FS caused impacts on milestones.

[3]Date revised because of incorrectly reported data in the FY 1993–1997 Five-Year Plan.

[4]Acceleration of schedules resulted from a planning change in the proposed disposal cell location.

FIVE-YEAR PLAN ESTIMATES



There are a number of potential activities at the Weldon Spring Site Remedial Action Project (WSSRAP) that may affect program requirements. These potential activities have not been included in the estimates below due to various uncertainties regarding scope of work, the phasing of regulatory reviews and approval schedules, availability of technology, lack of independent cost reviews and other factors. If further analysis of these uncertainties and potential additional work results in additional funding needs based on legal requirements, DOE will, through mechanisms such as reallocating budgetary resources, requesting funds through the normal appropriation process, supplemental requests or internal reprogramming, pursue funding for these activities, or where appropriate, based on technical reasons, enter into the formal conflict resolution process with regulatory bodies.

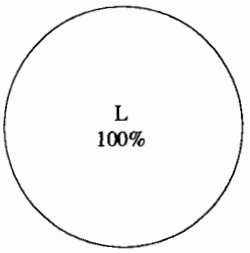
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Environmental Restoration	44,212	51,113	55,111	54,242	63,905	65,848	63,713
Total	44,212	51,113	55,111	54,242	63,905	65,848	63,713

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites.

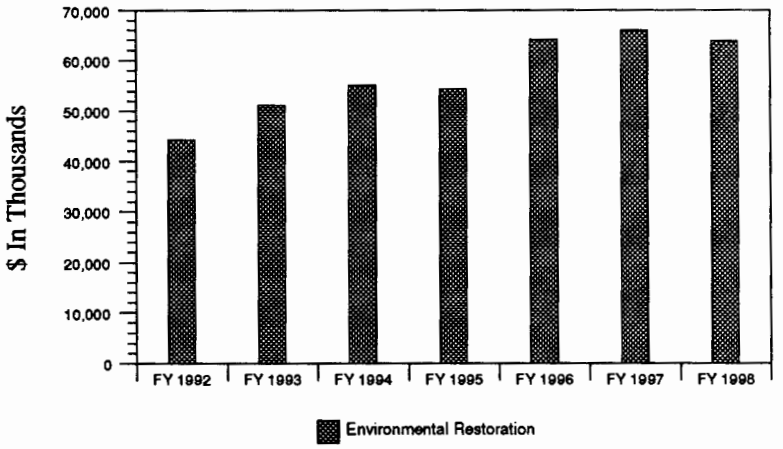
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



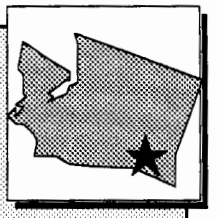
L- Legally Driven Requirements

Estimates by Year



For further information regarding Weldon Spring Site Remedial Action Project, call (314) 441-8978.

RICHLAND FIELD OFFICE
INSTALLATION SUMMARY
HANFORD SITE



DESCRIPTION

The Hanford Site encompasses 560 square miles within the Columbia River Basin in southeastern Washington State. This semidesert area is located to the north of Richland, Kennewick, and Pasco (population approximately 100,000). Activities at Hanford, which 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 1170 waste sites, grouped into 78 operable units (OUs) in four aggregate areas, will potentially require remediation. These aggregate areas are on the National Priorities List.

STRATEGIC OUTLOOK

The overall goal at Hanford is to clean up the Hanford Site in accordance with the Hanford Federal Facilities Agreement and Consent Order (Tri-Party Agreement), other agreements, and all applicable Federal, State, and local laws. Whenever possible, Expedited Response Actions have been undertaken to prevent immediate risk and to reduce the spread of contamination. Two such actions were completed in FY 1991.

Development and selection of the site's ultimate end state will require extensive interactions with the regulators, the public, and the various agencies of the Federal and State Governments as well as other external groups. The broad range of potential site-use, end-state alternatives will be evaluated through the National Environmental Policy Act process. The ultimate vision is to transform the Hanford Site into an environmentally attractive location for a broad range of future uses.

The Hanford Integrated Planning Process was developed by the DOE Richland Field Office (RL), and its contractors to develop technically sound, cost-effective, legally permissible, and publicly acceptable plans for accomplishment of the cleanup mission. A top-down systems engineering approach has been adopted at RL to ensure that key relationships among the various activities and resources at the site are fully considered.

The Hanford Site is working toward developing advanced waste treatment, storage, and disposal (TSD) technologies. In fulfilling its goal of bringing all of the Hanford Site facilities into full environmental compliance and cleaning up its waste sites, as required through the regulatory process, RL intends to foster a culture of clear and open communication with all stakeholders and the public. Meaningful public participation will be expanded as RL continues to seek innovative approaches to cleanup, to reduce the total cost, to comply with environmental regulations, and to meet the 30-year cleanup goal.

STRATEGIC OUTLOOK (Continued)

RL supports the Transportation Logistics Program within the Office of Technology Development. These Programs establish DOE policy and procedures for the safe and cost-effective transportation of hazardous materials (particularly radioactive) substances and wastes in support of DOE programs.

Currently, items of particular interest at the Hanford Site center on waste tank safety issues; new waste being generated by cleanup activities and its disposition; the Tank Waste Remediation System (TWRS), which includes the Hanford Waste Vitrification Project (HWVP); and expedited response actions. Major issues at the Hanford Site include:

- Flammable gas generation, potential explosive mixtures of hydrogen gas from ferrocyanide reactions, potential organic-nitrate reactions, toxic vapors, and continued cooling required for high heat generation in tanks are issues being addressed with regard to the single and double-shell underground storage tanks at the Hanford Site.
- The TWRS initiative will integrate efforts to characterize, retrieve, treat, and dispose of both double and single-shell tank waste with a systems engineering approach. This system includes HWVP, grout and other related Hanford waste tank activities in a coordinated system.
- The objective of the HWVP is to convert pretreated Hanford Site defense high-level waste and transuranic waste in underground storage tanks into a solid, vitrified (glass) form suitable for final disposal in a geologic repository.
- Extensive amounts of waste from cleanup activities must be characterized, packaged, and disposed of appropriately. Efficiencies in the waste characterization process are needed as are decisions on ultimate waste disposition.
- Expedited Response Actions are the vehicles whereby attention is focused on performance of remediation activities at sites, that represent an immediate risk and the potential for the spread of contamination. Two of three such Expedited Response Actions were initiated and completed in FY 1991. As other sites are identified, they will be pursued to completion.

Single-shell tank safety activities are aimed at reducing risks associated with waste in these tanks before transferring the waste to double-shell tanks. Pretreatment and vitrification of this waste will follow. Analytical laboratory upgrades are necessary to support this cleanup mission. These upgrades include construction of a low-level waste laboratory, construction of additional hot cells for high activity samples, and expanded use of commercial analytical services. Construction of the mixed waste storage facilities and Waste Receiving and Processing Facility (Modules I and IIa) will help support disposition of waste generated from on-site cleanup activities. Ultimate disposition remains an issue to be resolved. Taken together, these activities reflect the Hanford strategy for 30-year site cleanup.

As a result of the termination of the defense mission at the Hanford Site in 1989, transition activities at the Hanford Site are under way. It should be noted that Hanford is one of the sites to be considered in the reconfiguration Programmatic Environmental Impact Statement (PEIS) for location of Complex 21 facilities.

ACCOMPLISHMENTS (FY 1991 – 3Q FY 1992)

Corrective Actions

- Compliance with interim status requirements was achieved (except for groundwater monitoring and closure plans).
- Sixty-one RCRA groundwater monitoring wells were installed in Calendar Year 1991.
- RCRA Part B Permit Applications were submitted to the Washington State Department of Ecology and EPA for the 242-A Evaporator Facility and double-shell tanks (DST) in accordance with Tri-Party Agreement milestones.
- Contingency plans for the 242-A Evaporator, single-shell tanks (SST), and DSTs were completed in accordance with Tri-Party Agreement milestones.
- Waste Analysis Plans for SSTs, 242-A Evaporator, B Plant, B Plant active TSDs, and T Plant were completed.
- Facility effluent monitoring plans were completed as scheduled.

Waste Management

- In preparation for 242-A Evaporator restart (March 1993), construction of effluent retention basins was initiated in 1990 and will be completed in FY 1993.
- Surveillance of Tank 241-SY-101 continued throughout the year; development of more specialized monitoring equipment allowed further characterization of the tank contents.
- Of the 37 Waste Management FY 1991 Tri-Party Agreement milestones, 25 were completed on or ahead of schedule. Of the remaining 12 milestones, seven were deleted, one was superseded by another milestone, and four are undergoing dispute resolution.
- The 4843 Alkali Metal Storage Facility, 105-DR Reactor Facility, and 3718-F Alkali Metal Treatment and Storage Facility Closure Plans were submitted to Ecology in accordance with Tri-Party Agreement milestones.
- RCRA Part B Permit Applications for Central Waste Complex Radioactive Mixed Waste Storage, the Waste Retrieving and Processing Facility, PUREX Tunnels, Liquid Effluent Receiving Facility, and the 222-S Laboratory were submitted to Ecology and EPA in accordance with Tri-Party Agreement milestones.
- The B Plant Pretreatment Risk Assessment was completed ahead of schedule as a part of the effort to determine a viable option for pretreatment of double-shell tank waste.
- Nine SST core samples were taken.
- One new major milestone and 86 new interim milestones were negotiated with the Washington State Department of Ecology. These deal with liquid effluents.

Environmental Restoration

- Three Expedited Response Actions were initiated: the 300 Area Process Trenches, 618-9 Burial Ground, and 200 West Carbon Tetrachloride Site. The 300 Area Process Trenches and the 618-9 Burial Ground ERAs were completed in FY 1991 ahead of schedule and under budget.
- Waste removal from the 183-H Solar Evaporation Basins was completed in FY 1991. Ecology accepted the Closure Plan and made it available for public review on January 15, 1992; final closure strategy will be based on public review comments and characterization results.

ACCOMPLISHMENTS (Continued)

- Nonintrusive activities were initiated on the first 11 OUs in Area 100 in FY 1991.
- Remedial Investigation/Feasibility Study (RI/FS) activities (groundwater well installation) continued on OUs 1100-EM-1, 200-BP-1, 300-FF-1, and 300-FF-5.
- The draft Surplus Production Reactors Decommissioning Environmental Impact Statement (EIS) has been submitted to DOE Headquarters for a Record of Decision (ROD).
- Five of seven Tiger Team Findings were completed and await verification.
- All Tri-Party Agreement milestones (11) were completed on schedule in FY 1991, and all nine scheduled milestones have been completed thus far in FY 1992.
- Three original work plans and ten rescoped OU work plans were submitted to the Washington State Department of Ecology.

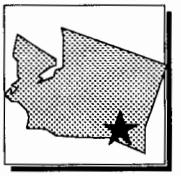
Technology Development

- An in situ method for measuring physical properties of soils and wastes, using a commercially available cone penetrometer, was demonstrated in simulated tank wastes.
- Laser Raman spectroscopy probes that can analyze tank wastes or subsurface contamination in situ were developed .
- Decontamination of 35,000 gallons of radioactive hexone solvent was successfully demonstrated.
- A national robotics demonstration of control and positioning systems using coupled remotely operated articulated arms was completed.

Transportation

- An effective training program covering transportation operations such as vehicle inspection and load tie-down is still provided on a DOE-wide basis to ensure transportation and packaging personnel are current on regulations.
- A strategic plan and functional requirements document was developed, and two pilot site locations for the Automated Transportation Management System (ATMS) were established.
- The EDI interface of ATMS was successfully tested.
- A Resource Guide for Performance-Oriented Packagings was developed.
- The Motor Carrier Evaluation Program continued to ensure use of best carriers available.

RICHLAND FIELD OFFICE
PROGRESS CHART
HANFORD SITE



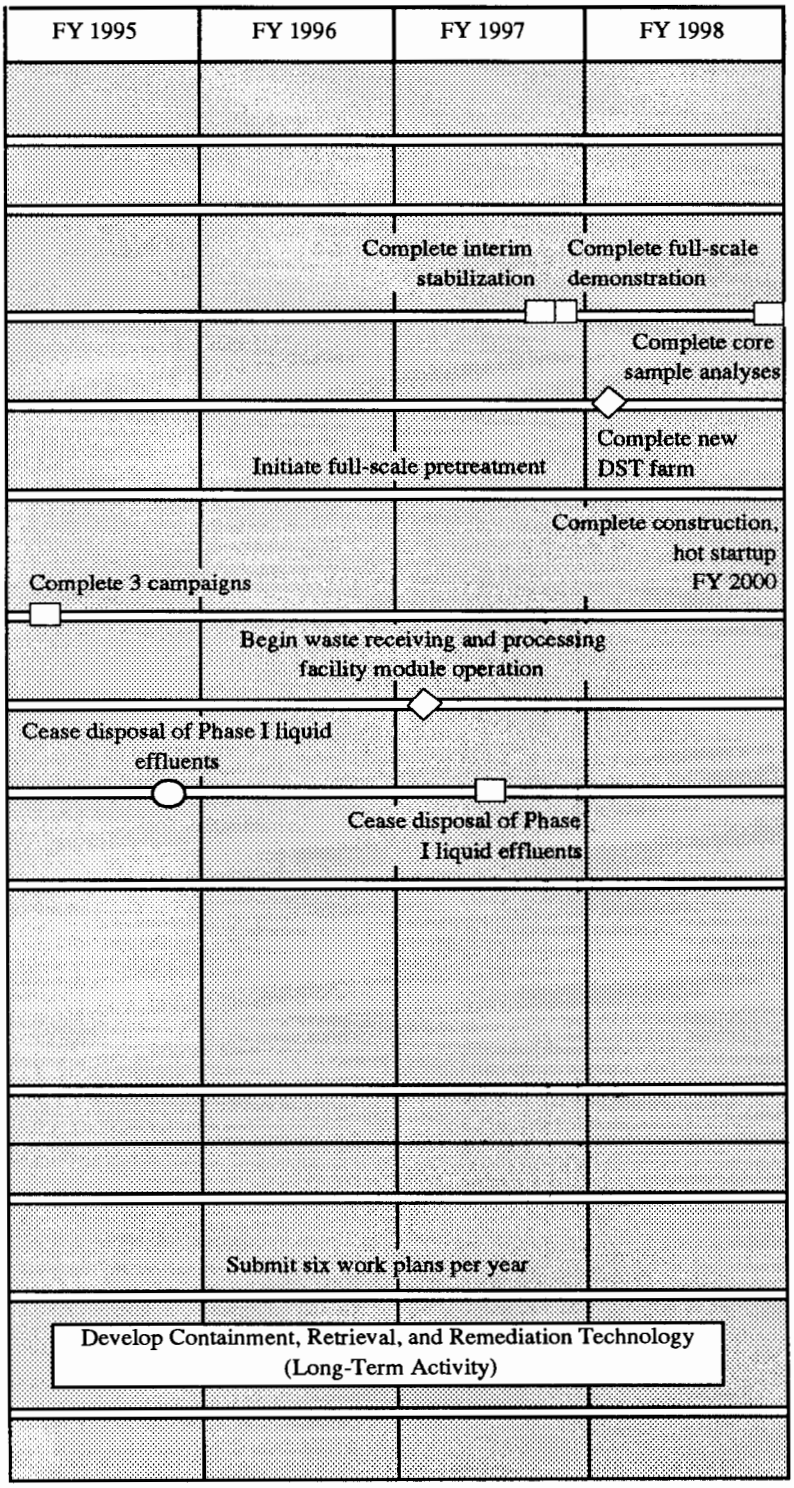
	Task Description	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994
Corrective Activities & Waste Management	RCRA Interim Status		Achieve compliance with Interim status requirements			
	Groundwater Monitoring Wells	Purge Water for Storage Facilities	30 wells	Begin 50 wells per year		
	Single Shell Tanks	Tank safety activities			242–A Evaporator startup	
	Double Shell Tanks		Pretreatment Risk Assessment		Begin construction HWVP	
	Pretreatment & Hanford Waste Vitrification Plant					
	Grout Facility		Low-level grout disposal at Hanford			
	Solid Waste Activities	Issue land disposal restriction plan			Complete mixed waste storage facility construction	
	Soil Column Activities				Liquid Effluent Retention Facility (for evaporated effluent)	
	Nuclear Facilities				ROD for EIS for fuel disposition	
	Analytical Services				Low-level laboratory operational	Hot cell mixed waste expansion operational
Environmental Restoration	D&D Activities	EIS, 100-Area reactors	ROD, 100-Area reactors		Closure 183-H Basin	
	ER and Remedial Action Investigations			Submit 15 OU Work Plans		
	Remedial Actions	Start Expedited Response Actions				

Long–Term Objectives

Clean up all OUs by FY 2018.
Characterize tank wastes and 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 (HWVP).
Operate grout and Waste Receiving and Processing Plants.
Submit majority of remedial action work plans.
Operate low-level and hot cell laboratories.
Complete Interim single-shell tank stabilization and isolation.
Continue significant RI/FS and remediation activities.



Milestone Types

- Unchanged from FY 1993-1997 FYP
- New since FY 1993-1997 FYP
- Changed from FY 1993-1997 FYP

Milestone Status

- Planned
- Complete
- 50 percent complete
- Information flow

Notes and Acronyms

D&D - decontamination and decommissioning
DST - Double Shell Tank
EIS - Environmental Impact Statement
FYP - Five-Year Plan
HWVP - Hanford Waste Vitrification Plant
OU - Operable Unit
RI/FS - Remedial Investigation/Feasibility Study
ROD - Record of Decision

MAJOR MILESTONES

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan or Tri-Party Agreement	Regulatory Driver
Corrective Activities			
• Start construction of Plutonium Finishing Plant enclosed Material Handling Facility.	1Q FY 1993	Eliminated	
• Submit T Plant Treatment Tank Part B Permit Application.	4Q FY 1993	4Q FY 1993[1]	WAC 173-303
• Complete Phase IV Mixed Waste Storage Facility construction.	4Q FY 1993	1Q FY 1993	WAC 173-303
Waste Management			
• Start Operation of 242-A Evaporator and Liquid Effluent Retention Facility.	1Q FY 1992	2Q FY 1993[1]	TPA
• Begin operation of low-level waste laboratory.	2Q FY 1992	3Q FY 1994[2]	
• Complete three grout campaigns for disposal of double-shell tank waste.	3Q FY 1993	1Q FY 1995[3]	TPA
• Cease disposal of Phase I liquid effluents into soil column.	3Q FY 1995	3Q FY 1995	TPA
• Begin operation of 222-S mixed waste hot cell expansion.	New	3Q FY 1994[4]	TPA
• Complete 12 grout campaigns for disposal of double-shell tank waste.	4Q FY 1996	1Q FY 1999[1]	TPA
• Complete interim stabilization and isolation of 149 single-shell tanks (potentially excluding some tanks with safety concerns).	4Q FY 1997	4Q FY 1997	TPA
• Submit Transuranic Waste Storage and Assay Facility Part B Permit Application (M-20-23)	New	3Q FY 1992	TPA
• Begin Waste Receiving and Processing Facility, Module I Operations.	4Q FY 1997	2Q FY 1997[1]	TPA
• Complete construction and hot startup of HWVP.	New	1Q FY 2000	TPA
• Complete new Double-Shell Tank Farm.	New	1Q FY 1998	TPA
• Complete analysis of two core samples from each SST.	New	4Q FY 1998[1]	TPA

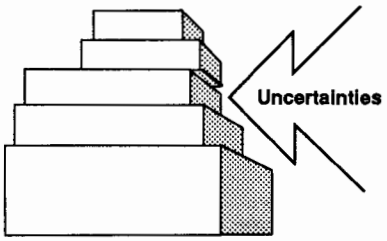
MAJOR MILESTONES (Continued)

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan or Tri-Party Agreement	Regulatory Driver
• Complete multipurpose storage facility feasibility study.	New	2Q FY 1992	TPA
Environmental Restoration			
• Submit Consolidated RI Phase II and Feasibility Study Phase III on OU 1100-EM-1 to the regulators (M-15-01 B/C).	3Q FY 1992	1Q FY 1993[1]	TPA
• Complete 183-H Solar Basin Closure.	4Q FY 1992	4Q FY 1992[1]	RCRA
• Submit 300 Area Process Trench (M-20-32) Closure/Postclosure Plan to EPA/Ecology.	4Q FY 1994	4Q FY 1994	TPA/RCRA
• Complete RI/FS process for all OUs.	New	4Q FY 2005	TPA
• Complete remedial actions for all OUs.	New	4Q FY 2018	TPA
Technology Development			
• Support investigation and demonstration of waste management and environmental restoration technologies.	New	1Q FY 1995	DOE SEN 33-91
Transportation			
• Enhance the Motor Carrier Evaluation Program to include small volume transporters.	New	FY 1992	DOE Management Initiative
• Perform specific traffic special studies to improve transportation operations and provide cost-savings.	New	FY 1992	DOE Management Initiative
• Begin prototype testing of the ATMS.	New	FY 1992	DOE Management Initiative
• Start construction of core modules for the ATMS.	New	FY 1993	DOE Management Initiative

[1]Requires Tri-Party Agreement negotiations and/or a Change Request has been submitted.
[2]Tri-Party Agreement negotiations have been concluded and the date indicated is the result of this action.
[3]Delay caused by technical complexity.
[4]Accelerated because of safety programmatic needs.

SEN - Secretary of Energy Notice
TPA - DOE, EPA, State Tri-Party Agreement
WAC - Washington Administrative Code

FIVE-YEAR PLAN ESTIMATES



In the estimates below there are a number of potential activities at Hanford that will have an effect on program requirements and the status of the interagency agreement. These potential activities have not been included in these estimates due to various uncertainty factors regarding scope of work, approval schedules, availability of technology, and other factors. At Hanford, there are significant uncertainties about the scope of the tank safety upgrades and disposition of the resulting material. Decisions must still be made about the Hanford Waste Vitrification Plant and technical uncertainties about this project could impact the Tri-Party agreement. If further analysis of these uncertainties and potential additional work results in additional funding needs based on legal requirements, DOE will, through mechanisms such as reallocating budgetary resources, requesting funds through the normal appropriation process, supplemental requests or internal reprogramming, pursue funding for these activities, or where appropriate, based on technical reasons, enter into the change resolution process with regulatory bodies.

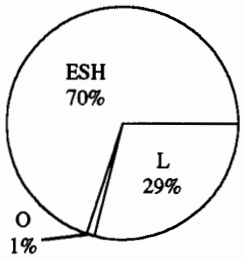
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Corrective Activities/Waste Management	886,505	1,177,995	1,385,125	1,510,326	1,650,069	1,803,786	1,841,128
Environmental Restoration	161,410	186,745	203,483	223,733	246,190	270,702	297,571
Facility Transition	0	2,000	2,000	2,000	2,200	2,500	2,550
Total	1,047,915	1,366,740	1,590,608	1,736,059	1,898,459	2,076,988	2,141,249

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites.

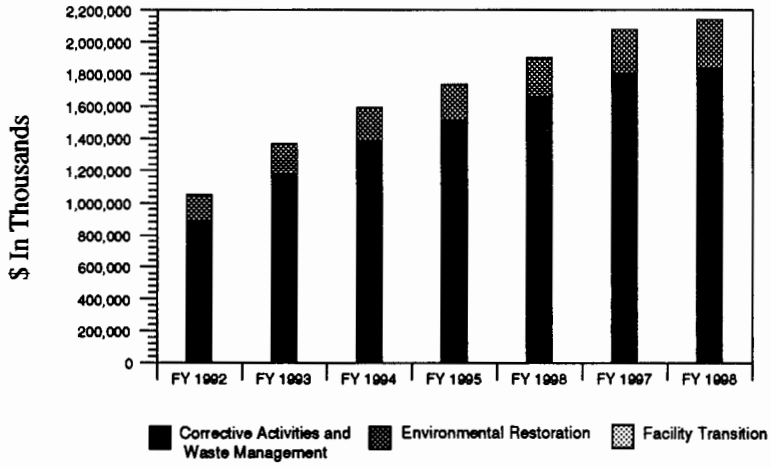
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



L- Legally Driven Requirements
ESH- Environment, Safety, and Health Requirements
O- Other Desirable Activities

Estimates by Year



For further information regarding Richland, call (509) 376-7501.

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ROCKY FLATS OFFICE
INSTALLATION SUMMARY
ROCKY FLATS PLANT

DESCRIPTION

Rocky Flats Plant (RFP) is located in northern Jefferson County, approximately 16 air miles northwest of Denver, Colorado. RFP is situated on approximately 400 acres and, together with the buffer zone, encompasses approximately 11 square miles. RFP's primary mission before January 1992 was to produce nuclear weapons components fabricated from plutonium and other metals. The mission has now changed to environmental cleanup. Inactive sites being investigated for possible contamination have been organized into 16 operable units (OUs), which contain individual hazardous substance sites (IHSSs) to be remediated under CERCLA and RCRA guidelines, per the Interagency Agreement (IAG) negotiated among EPA, the Colorado Department of Health (CDH), and DOE. Waste management activities at RFP include waste treatment, packaging, storage, and transport functions. These activities are carried out in compliance with the Federal Facility Compliance Agreement (FFCA) for Land Disposal Restricted Waste and applicable State and Federal regulations. Technology development is focusing on resolving critical waste management and environmental restoration problems and issues. The transition of buildings from Defense Programs (DP) to EM, which includes D&D activities, is currently being planned and is scheduled to begin in FY 1993.

STRATEGIC OUTLOOK

With the discontinuation of the production of nuclear weapons components at Rocky Flats and the proposal to accelerate the consolidation of the nonnuclear component manufacturing activities associated with the nuclear weapons complex recently announced by the Secretary of Energy, transition activities at RFP are currently being planned. The completion and implementation of these plans are pending the results of the Nonnuclear Consolidation Environmental Assessment and the Reconfiguration Programmatic Environmental Impact Statement and subsequent decisions resulting from these National Environmental Policy Act analyses.

RFP's goals are to begin D&D of facilities, investigate and remediate 16 OUs, manage surface water runoff both on- and off-site, and to treat, store, and dispose of waste in compliance with signed agreements and applicable Federal, State, and local regulations. To attain this goal, RFP has established a Transition Team to formulate plans for the DP-EM transition, for EM programs that address current EM problems, for ongoing EM programs that maintain RFP's objectives, and for ongoing EM support to these programs. Plans to use existing buildings for waste management programs would require those buildings and their operating procedures to be upgraded to present environmental, health, and safety standards. RFP currently has several agreements with Federal and State agencies: the National Pollutant Discharge Elimination System (NPDES)–FFCA, negotiated between DOE and EPA; the FFCA for LDR waste, negotiated between DOE and EPA; the IAG, negotiated among DOE, EPA, and CDH; the Agreement-in-Principle (AIP), negotiated between DOE and CDH; and the Residue Compliance Order, negotiated between DOE and CDH. RFP also operates under the requirements of RCRA, CERCLA, the *Colorado Code of Regulations*, Clean Air Act, Clean Water Act, NEPA, Solid Waste Disposal Act, NPDES, Colorado Water Quality Control Commission, the Endangered Species Act, and the Migrating Bird Act.

STRATEGIC OUTLOOK (Continued)

The mission of RFP's waste management operation is to implement waste treatment, packaging, storage, and transportation functions in the most efficient manner possible, while maintaining strict regulatory compliance and protecting human health and the environment. RFP currently handles sanitary wastes, hazardous wastes, TSCA wastes, low-level wastes (LLW), low-level mixed wastes (LLMW), transuranic (TRU) wastes, TRU-mixed wastes, and mixed residues. Sanitary wastes are disposed of in the on-site landfill; hazardous and TSCA wastes are shipped off-site to appropriate facilities. LLW and LLMW are currently treated and stored at RFP and are awaiting shipment to and disposal at the Nevada Test Site (NTS). The use of commercial facilities for disposal of LLW and LLMW is being studied as an option to disposal at NTS, which would require a waiver to certain requirements in DOE Order 5820.2A. TRU and TRU-mixed wastes are currently stored at RFP and are awaiting shipment to and disposal at the Waste Isolation Pilot Plant (WIPP). The current lack of disposal facilities will challenge RFP to maximize use of storage space and to investigate other storage options to remain within State and RCRA storage limits until other disposal facilities are available for RFP waste. Ongoing storage, disposal, and treatment programs are designed to ensure that waste management activities are performed in compliance with the RCRA Permit and the applicable Federal, State, and local regulations. Additional treatment programs will supply state-of-the-art equipment and systems to effectively and efficiently treat RFP wastes for storage and disposal.

RFP's Environmental Restoration Program characterizes and remediates environmental problems caused by past plant operations. Characterization and remediation of past contamination is designed to be carried out in a manner that protects human health and the environment and complies with RCRA, CERCLA, and the IAG. Characterization activities are well under way with several interim remediation activities in progress. Upon completion of the characterization activities, remediation of the OUs will begin. Sitewide and OU-specific treatability studies will expedite the selection of remedial alternatives and final remediation. RFP will be remediated to ensure future land-use goals are achieved. During this transition period, DOE intends to consider various future land-use scenarios for the Rocky Flats site. Opportunity for regulatory agency and public input will be incorporated into the decision-making process before a final land-use decision. Future land-use scenarios may include, but are not limited to, the following:

- designation of the site as an ecological preserve,
- privatization of the site for use by nongovernmental industry,
- development of the site as a research or office park for Federal agencies other than DOE,
- use of the site by the State government or university system for research or business purposes, and
- some combination of the above options.

These considerations are currently in the very early stages of the planning process, and much work must be done at the site before it is suitable for implementation of any of these options. As transition progresses, the public will be invited and encouraged to participate in the selection of a final land-use option for the Rocky Flats site.

Under RFP's Surface Water Management Plan, surface water run-off will be managed, both on- and off-site, to control and treat surface water flows and potential contamination that may be transported into off-site drinking water reservoirs. On-site management ("Option J") would be DOE's responsibility, and off-site ("Option B") will be the downstream communities' responsibility, funded by DOE via a grant to the communities.

RFP's technology development programs focus on providing RFP with effective technologies for the treatment of TRU, TRU-mixed, LLW, LLMW, and hazardous wastes. Technology development's primary objective is to develop numerous technologies for waste management to facilitate compliance with the RFP FFCA for LDR waste. Technology development programs in support of environmental restoration consist of three technologies for water and measurement programs. Additional technology development activities include project management support activities.

ACCOMPLISHMENTS (FY 1991 – 3Q FY 1992)

Corrective Activities

- Began negotiations with CDH on the National Emission Standards for Hazardous Air Pollutants (NESHAPs)-FFCA.

Waste Management

- Completed LLW and LLMW Roadmaps, FY 1993–1997 Five-Year Plan, and FY 1992 Site-Specific Plan.
- Made payments to the State and local communities per the AIP.
- Met all deliverables required by the FFCA and AIP.
- Completed and received approvals on the "Waste Management Community Relations Plan."
- Established a formal Waste Minimization program, documenting strategic and tactical plans to guide waste minimization activities.
- Processed through recycling 400 tons of paper and significantly reduced solvent usage in nonplutonium production buildings in FY 1991.
- Completed Waste and Environmental Management System off-site certification and shipping module.
- Prepared conceptual design, design criteria, and permit application for the new landfill.
- Prepared TRU Part B Permit Modification for TRU mixed waste.
- Completed instrumentation upgrades, and added an automatic chlorination/dechlorination system to the sewage treatment plant.
- Completed Zero Discharge Plan and implemented Surface Water Management Plan.
- Completed Waste Minimization Report required under the FFCA for LDR waste.
- Submitted annual LDR Progress Report to EPA.
- Prepared and submitted the Comprehensive Treatment and Management Plan as required by the FFCA for LDR waste.
- Prepared and submitted seven RCRA permit modifications.
- Treated approximately 13 million gallons of aqueous process waste.
- Shipped approximately 200 drums of nonradioactive hazardous waste off-site for disposal.

Environmental Restoration

- Signed the final RFP Interagency Agreement among DOE, CDH and EPA on January 22, 1991. This agreement outlines multiyear schedules for environmental restoration characterization and remediation activities.
- Completed the french drain for OU 1 for collection of contaminated groundwater, and the drain is now operating.
- Completed construction of the 891 Treatment Building at OU 1, 881 Hillside. This activity is a major step toward the startup of the interim remedial actions for OU 1.
- Completed radiological surveys at the old landfill and in the area east of the 903 Pad.

ACCOMPLISHMENTS (Continued)

- Completed OU 1 interim measure/interim remedial action construction.
- Started the OU 1 Phase III RFI/RI fieldwork. The Final IRA Decision Document and the Final Phase III Remedial Investigation (RI) Work Plan were completed.
- Completed the OU 2 Draft Responsiveness Summary, IRA Decision Document, and the Draft Phase II RI Work Plan (Bedrock).
- Completed the construction of the OU 2, 903 Pad IRA and treatment facility.
- Completed the OU 3 Final Historical Information, Preliminary Health Risk Assessment Report, and Final Remedy Report.
- Completed the OU 4 Final Phase I RCRA Facility Investigation (RFI/RI) Work Plan.
- Completed the OU 5 Final Phase I RFI/RI Work Plan.
- Submitted the OU 6 Final Phase I RFI/RI, Environmental Evaluation, and Human Health Risk Assessment Work Plan to EPA and CDH.
- Submitted the Environmental Assessment for the Standley Lake Diversion Project, a drainage system to protect the lake from future contaminated runoff from the plant, for public comment.

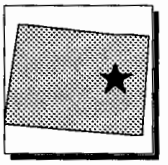
Technology Development

- Completed construction, installation, and demonstration of the pilot-scale microwave solidification process.
- Completed construction of a pilot-scale supercritical carbon dioxide extraction unit.
- Completed design and initiated construction of a pilot-scale, critically-safe-geometry, joule-heated glass melter for treating TRU waste.

Transition Activities

- Completed EM draft of requirements and criteria for transitioning facilities.
- Completed the Rocky Flats Transition Plan and submitted it to Congress.

ROCKY FLATS OFFICE PROGRESS CHART ROCKY FLATS PLANT



	Task Description	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994
Corrective Activities and Waste Management	RFP Corrective Activities				NESHAPs/Radioactive Stack Emissions	
	Waste Disposal			Begin Shipments LLW to NTS		
	Sewage Treatment Plant Upgrades (NPDES-FFCA)		Complete Instrument and Automation improvements			Complete Phase II Sewage Treatment Upgrades
	Waste Storage			Operate TRUPACT II Loading Facility		
	New Sanitary Landfill		Complete Conceptual Design and Design Criteria		Obtain Permit for new sanitary landfill	
	Waste Treatment			Begin Operating Supercompactor		Conceptual design of TTPU
	LDR-FFCA		Zero Discharge Plan; Nonradioactive shipping schedule; Complete LDR-FFCA Waste Minimization Report	Implement Surface Water Management Plan; Annual Progress Report; Submit CTMP	Waste Stream & Residue Identification & Characterization Report 9/92	
Environmental Restoration	Environmental Restoration Assessment Activities		OU 1 Phase III Work Plan; OU 3 Final Past Remedy Report; OU 2 Phase II RFI/RI Work Plan	OU 5 and OU 6 Phase I RFI/RI Work Plan; Historical Release Report		OU 2 Phase II RI/RFI Report; OU 3 Phase I RI/RFI Report
	Environmental Restoration Remediation Activities			OU 1 IM/IRA construction; OU 2 IM/IRA construction (radionuclide removal system)		

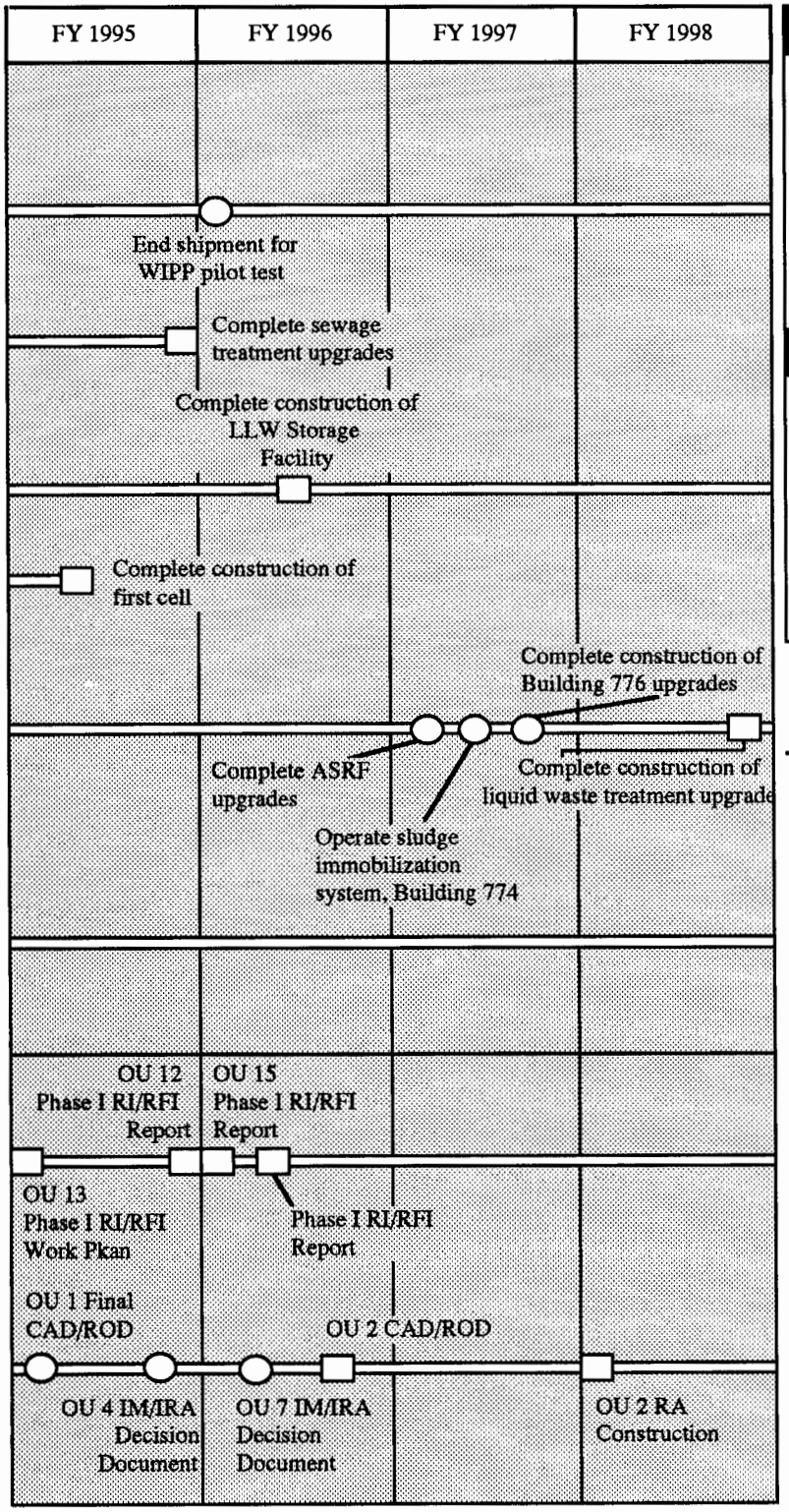
ROCKY FLATS

Long-Term Objectives

Complete environmental remediation of all OUs by 2019.
Construct and operate new sanitary landfill.
Implement treatment technologies for LDR wastes.
Implement Comprehensive Waste Water Management Plan.
Implement D&D.

Five-Year Objectives

Complete all corrective activities.
Complete Phase I RI/RFIs on all applicable OUs.
Ship LLW, LLMW, including Saltcrete to NTS
Properly manage liquid and solid waste.
Plan and implement D&D.



Milestone Types

- ○ Unchanged from FY 1993-1997 FYP
- ◇ New since FY 1993-1997 FYP
- □ Changed from FY 1993-1997 FYP

Milestone Status

- ○ ◇ □ Planned
- ● ◆ ■ Complete
- 50 percent complete
- Information flow

Notes and Acronyms

ASRF - Advanced Size Reduction Facility
CAD - Corrective Action Decision
CTMP - Comprehensive Treatment and Management Plan
D&D - decontamination and decommissioning
FFCA - Federal Facility Compliance Agreement
FYP - Five-Year Plan
IAG - Interagency Agreement
IM - Interim Measure
IRA - Interim Remedial Action
LDR - Land Disposal Restrictions
LLMW - low-level mixed waste
LLW - low-level waste
NESHAPS - National Emission Standards for Hazardous Air Pollutants
NTS - Nevada Test Site
OU - Operable Unit
RFI - RCRA Facility Investigation
RI - Remedial Investigation
ROD - Record of Decision
TRU - Transuranic
TRUPACT - Transuranic Package Transporter
TTPU - Thermal Treatment Processing Unit
WIPP - Waste Isolation Pilot Plant

MAJOR MILESTONES

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
Corrective Activities and Waste Management			
• Begin operating the supercompactor.	4Q FY 1991	4Q FY 1992[1]	State imposed storage limits on interim storage.
• Begin operating the TRUPACT II loading facility.	4Q FY 1991	FY 1992[2]	49 CFR 171-179 DOE Order 1540.2
• Resume shipments of low-level waste to NTS.	FY 1992	FY 1992[3]	RCRA Permit N°C0.789526
• Implement Cost/Schedule Control Criteria	FY 1993	FY 1994[4]	DOE Order 4700, 4700.1, 5700.2C
• Complete Phase II Sewage Treatment Plant upgrades.	New	FY 1994	FFCA (NPDES)
• Obtain permit for new sanitary landfill.	FY 1992	FY 1994[5]	6 CCR 1007-2
• Prepare RCRA permit modifications for Supercompactor, sludge immobilization system, and baler upgrade.	New	FY 1994	RCRA 49 CFR 270.1
• Complete Title I Engineering for 776 upgrades.	FY 1994	FY 1995[6]	DOE Order 5820.2A
• Complete Sewage Treatment Plant upgrades.	FY 1993	FY 1995[7]	FFCA (NPDES)
• Complete construction of first cell of new sanitary landfill.	FY 1993	FY 1995	RCRA 40 CFR 258
• Begin construction of Building 374 upgrades.	FY 1995	FY 1996[8]	RCRA 40 CFR 264.73A,B
Environmental Restoration			
• Complete OU 2 IM/IRA construction (radionuclide removal system).	FY 1991	FY 1992[6]	IAG/Table 6
• Submit final Historical Release Report.	FY 1992	FY 1992	IAG/Table 6
• Complete Solar Pond cleanup.	FY 1993	FY 1993[6]	IAG/Table 6
• Complete OU 1 Phase III RI/RFI Report and submit.	FY 1993	FY 1993	IAG/Table 6
• Submit Final Phase II RFI/RI Alluvial Report for OU 2.	FY 1993	FY 1995[6]	IAG/Table 6

MAJOR MILESTONES (Continued)

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
• Submit OU 1 Draft Proposed Remedial Action Plan.	FY 1993	FY 1993	IAG/Table 6
• Submit OU 3 Final Phase I RFI/RI Report.	FY 1994	FY 1994[6]	IAG/Table 6
• Submit OU 4 Final Phase II RFI/RI Work Plan.	FY 1994	FY 1994	IAG/Table 6
• Submit OU 5 Final Phase I RFI/RI Report.	FY 1994	FY 1994	IAG/Table 6
• Submit OU 7 Final Phase I RFI/RI Report.	FY 1994	FY 1994	IAG/Table 6
• Submit OU 9 Draft Phase I RFI/RI Report.	FY 1994	FY 1994	IAG/Table 6
• Submit OU 11 Draft Phase I RFI/RI Report.	FY 1994	FY 1994	IAG/Table 6
• Submit Corrective Action Decision/Record of Decision for OU 1.	FY 1995	FY 1995	IAG/Table 6
• Submit Corrective Action Decision/Record of Decision for OU 2.	FY 1996	FY 1996[4]	IAG/Table 6
• Begin Corrective/Remedial Action Construction for OU 1.	FY 1996	FY 1996	IAG/Table 6
• Begin Corrective/Remedial Action Construction for OU 2.	FY 1997	FY 1998[4]	IAG/Table 6
• Begin Remedial Action Construction for OU 6.	FY 1997	FY 1999[4]	IAG/Table 6
Technology Development			
• Investigate and demonstrate facility compliance technologies and processes.	New	4Q FY 1993	DOE Management Initiative
• Support investigation and demonstration of waste management and environmental restoration technologies.	New	1Q FY 1995	DOE Management Initiative
Transition Activities			
• Submit Plan Summary Report to Congress.	New	4Q FY 1992	DOE Management Initiative
• Implement Plan.	New	TBD	DOE Management Initiative

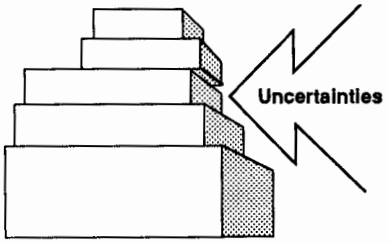
MAJOR MILESTONES (Continued)

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
• Complete building characterization.	New	4Q FY 1995	DOE Management Initiative

[1]Slipped because of delays in construction and additional system operational testing.
[2]Slipped because of an extensive rewrite of the safety analysis documentation.
[3]Original plan included shipment of some mixed waste.
[4]Slipped because enhancement to scope caused schedule to be extended.
[5]Slipped because design scope changes and allowance for more realistic time to get project approval.
[6]Slipped because of reprioritization of project.
[7]Slipped because project was rephased causing schedule to be extended .
[8]Slipped because of delays of construction.

CCR - *Colorado Code of Regulations*
CFR - *Code of Federal Regulations*
FFCA - Federal Facility Compliance Agreement
IAG - Interagency Agreement (DOE, EPA and State of Colorado)
NPDES - National Pollutant Discharge Elimination System

FIVE-YEAR PLAN ESTIMATES



There are a number of potential activities at Rocky Flats Plant (RFP) that may affect program requirements. These potential activities have not been included in the estimates below due to various uncertainties regarding scope of work, the phasing of regulatory reviews and approval schedules, availability of technology, lack of independent cost reviews and other factors. Uncertainties at RFP are due to the development of the off-site Water Management Plan, difficulty executing the pondcrete project and other issues. The impact of transition activities is unknown at this time, particularly regarding mixed waste storage limits. If further analysis of these uncertainties and potential additional work results in additional funding needs based on legal requirements, DOE will, through mechanisms such as reallocating budgetary resources, requesting funds through the normal appropriation process, supplemental requests or internal reprogramming, pursue funding for these activities, or where appropriate, based on technical reasons, enter into the formal conflict resolution process with regulatory bodies.

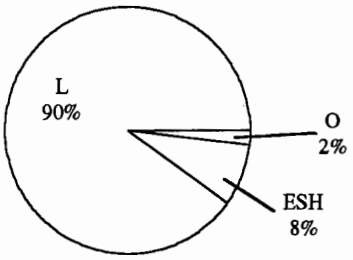
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Corrective Activities/Waste Management	106,883	117,716	124,069	134,021	146,968	161,211	164,670
Environmental Restoration	70,000	161,120	176,137	194,960	218,392	241,585	267,528
Facility Transition	0	4,461	4,461	4,900	5,400	5,900	5,950
Total	176,883	283,297	304,667	333,881	370,760	408,696	438,148

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites.

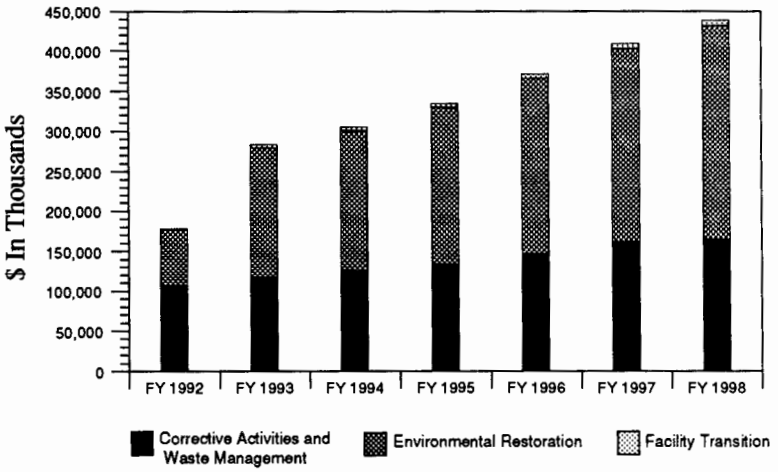
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



L- Legally Driven Requirements
ESH- Environment, Safety, and Health Requirements
O- Other Desirable Activities

Estimates by Year



For further information regarding Rocky Flats, call (303) 966-5993.

SAN FRANCISCO FIELD OFFICE
INSTALLATION SUMMARY
LABORATORY FOR ENERGY-RELATED HEALTH RESEARCH

DESCRIPTION

The DOE-owned Laboratory for Energy-Related Health Research (LEHR) occupies a 15-acre site 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. UCD used the laboratory for more than 30 years to conduct a DOE-sponsored research program on the health effects of exposure to low levels of radiation. The research contaminated five buildings, outdoor dog pens and cages, and a tank trailer; and generated radioactive sludge wastes and contaminated soils in trenches and pits. Some chemical and radioactive contaminants have reached the groundwater.

STRATEGIC OUTLOOK

LEHR's goal is to release the site in 1997 to UCD for unrestricted use as office and research space. The LEHR facility requires decontamination and decommissioning of buildings, site remediation of the soils, preparation of a feasibility study, and design of a treatment system for groundwater, if required, before release. Specific facilities and areas may be released before 1997 after remediation is completed.

To meet this goal, characterization and assessment of soil and groundwater have been made a priority. Currently, only preliminary characterization of contaminated soil has been done. Contamination has been found in the first water-bearing zone, which is traceable to the proximate soils. Continuing efforts are being made to identify contaminants, extent of contamination, location of contamination, and other factors necessary for remediation. National Environmental Policy Act (NEPA) environmental documentation will also be prepared. Remediation will be performed to levels accepted and agreed upon by DOE, UCD, and appropriate regulatory agencies. A Memorandum of Agreement exists between DOE and UCD that details the expectations of each party and establishes a steering committee to guide the project.

ACCOMPLISHMENTS (FY 1991 – 3Q FY 1992)

- Packaged and shipped radioactively contaminated biological waste to the DOE Hanford Site for disposal.
- Installed ten groundwater monitoring wells and obtained 55 soil borings.
- Completed draft NEPA documentation for decontamination and decommissioning of building and associated facilities.
- Packaged and shipped strontium-90 radioactive source to DOE Argonne National Laboratory.
- Completed activities related to the removal, treatment, packaging, and disposal of approximately 35,000 gallons of sludge waste.
- Completed dose reconstruction studies to evaluate potential exposure to public from past operation of on-site cobalt-60 irradiator facility.
- Completed characterization of buildings AH-1 and AH-2 and work plan for decontamination and decommissioning of these facilities.
- Completed the following planning and report documents: UCD Work Element Quality Assurance Plan; LEHR Training Plan; Bechtel Quality Assurance Plan; Cobalt-60 source removal work plan; Waste Handling, Processing and Packaging Procedures; Bechtel Engineering Package; Project Health and Safety Plan; Dames and Moore Draft Waste Characterization; Decontamination and Decommissioning Alternative Assessment; Waste Certification Plan; Waste Management Plan; Waste Minimization Plan.

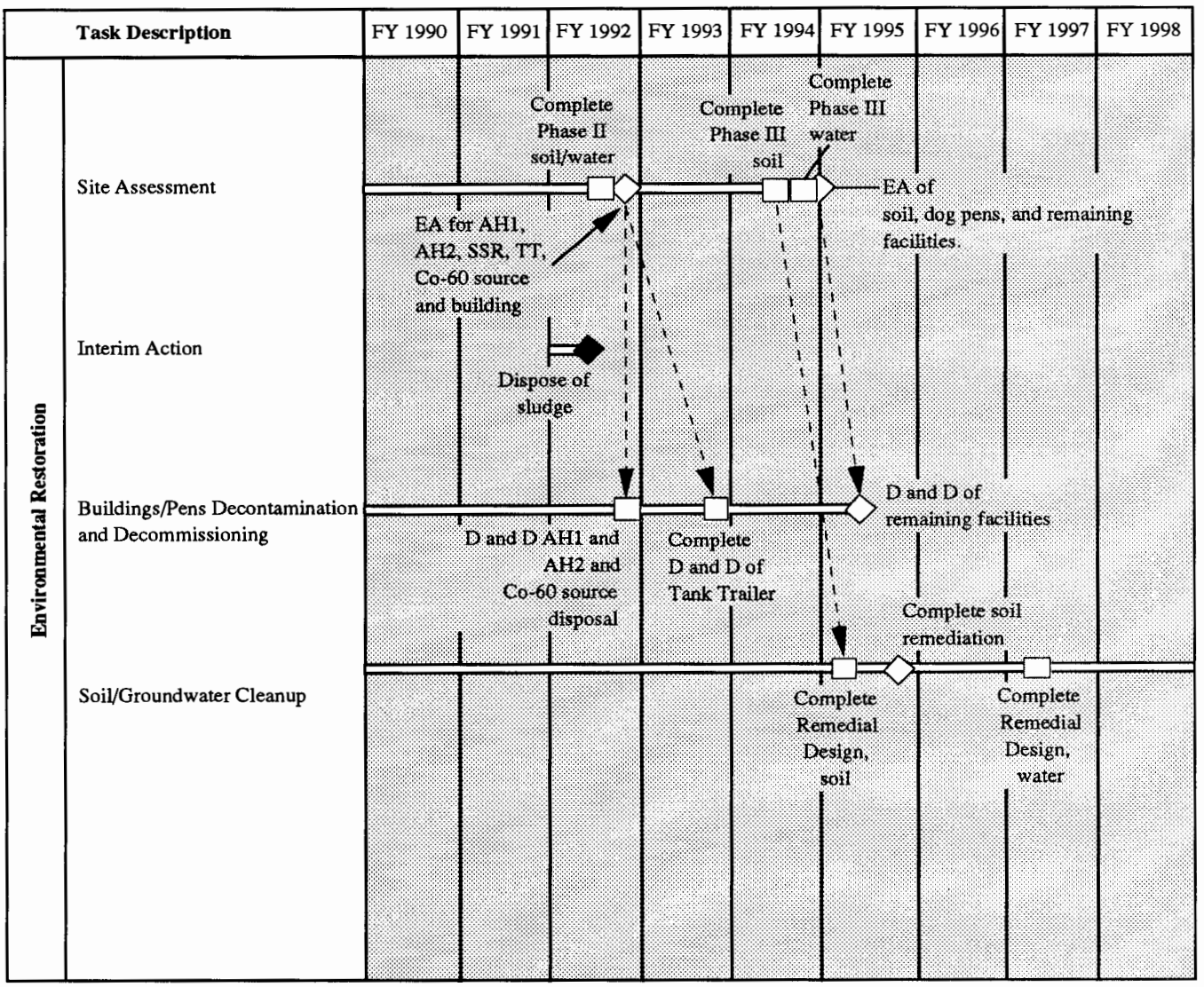
SAN FRANCISCO FIELD OFFICE
PROGRESS CHART
LABORATORY FOR ENERGY-RELATED HEALTH RESEARCH

Long-Term Objectives

Same as the Five-Year objectives. Cleanup (except groundwater) to be completed by FY 1997.

Five-Year Objectives

Complete site assessment.
Complete interim actions.
Decontamination and decommission buildings and associated facilities.
Clean up soil.
Release site to University of California at Davis.



Milestone Types

- Unchanged from FY 1993–1997 FYP
- New since FY 1993–1997 FYP
- Changed from FY 1993–1997 FYP

Milestone Status

- Planned
- Complete
- 50 percent complete
- Information flow

Notes and Acronyms

AH-1 - Animal Hospital 1
AH-2 - Animal Hospital 2
Co-60 - Cobalt 60 radioactive source
D&D - decontamination and decommissioning
EA - Environmental Assessment
FYP - Five-Year Plan
SSR - Specimen Storage Room
TT - Tank Trailer

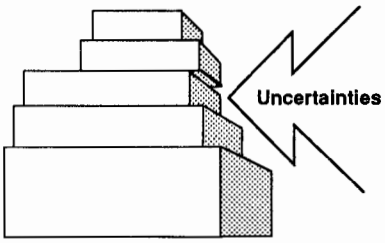
MAJOR MILESTONES

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
Environmental Restoration			
• Complete National Environmental Policy Act (NEPA) environmental assessment (EA) for AH-1, AH-2, Specimen Storage, Tank Trailer, Co-60 source, Co-60 building.	4Q FY 1991	4Q FY 1992[1]	NEPA
• Complete Co-60 source disposal.	2Q FY 1992	4Q FY 1992[2]	MOA
• Complete Phase II soil and groundwater characterization/assessment.	3Q FY 1992	4Q FY 1992[3]	CERCLA Sect. 120
• Complete D&D of buildings (AH-1 & AH-2)	4Q FY 1993	2Q FY 1993[4]	MOA
• Complete Phase III soil characterization/assessment.	1Q FY 1994	2Q FY 1994[5]	CERCLA Sect. 120
• Complete Phase III groundwater characterization/assessment.	1Q FY 1994	4Q FY 1995[6]	CERCLA Sect. 120
• Complete NEPA documentation for soil and remaining facilities.	4Q FY 1992	4Q FY 1994[7]	CERCLA Sect. 120, MOA
• Complete soil remedial design.	3Q FY 1995	1Q FY 1995[8]	CERCLA Sect. 120
• Complete groundwater remedial design.	3Q FY 1995	2Q FY 1997[9]	CERCLA Sect. 120
• Complete soil remediation.	4Q FY 1995	4Q FY 1995	CERCLA Sect. 120
• Complete D&D of remaining facilities (Imhoff, Co-60 Building, Specimen Storage).	4Q FY 1991	2Q FY 1995[10]	MOA
• Complete D&D of tank trailer.	4Q FY 1993	4Q FY 1993	MOA
• Complete D&D of dog pens.	4Q FY 1993	2Q FY 1995[10]	MOA

MOA - Memorandum of Agreement between UCD and DOE.
NEPA - National Environmental Policy Act

[1] Slipped because of change in scope of EA, need for additional quantitative data to support Finding of No Significant Impact and requirements for State and public involvement.
[2] Slipped because of delay in EA approval.
[3] Slipped because of delays in receiving analytical results from laboratory.
[4] Early D&D caused by split in milestones. FY 1993–1997 milestones covered all D&D activities. FY 1994–1998 covers only AH-1 and AH-2 D&D.
[5] Slipped because of change of scope.
[6] Slipped because of change in priority.
[7] Slipped because of need for detailed characterization and risk assessment to prepare an EA and the lengthy approval process of EA.
[8] Early start because of reprioritization and need for source removal.
[9] Rescheduled because of reprioritization and need for resolving groundwater issues between DOE and UCD.
[10] Slipped because of reprioritization.

FIVE-YEAR PLAN ESTIMATES



There are a number of potential activities at the Laboratory for Energy-Related Health Research (LEHR) that may affect program requirements. These potential activities have not been included in the estimates below due to various uncertainties regarding scope of work, the phasing of regulatory reviews and approval schedules, availability of technology, lack of independent cost reviews and other factors. Uncertainties in part at LEHR are related to decontamination and decommissioning activities of remaining facilities (Imhoff, C060 Building, Specimen Storage). In additon, uncertainties exist in DOE liability for disposal area cleanups. If further analysis of these uncertainties and potential additional work results in additional funding needs based on legal requirements, DOE will, through mechanisms such as reallocating budgetary resources, requesting funds through the normal appropriation process, supplemental requests or internal reprogramming, pursue funding for these activities, or where appropriate, based on technical reasons, enter into the formal conflict resolution process with regulatory bodies.

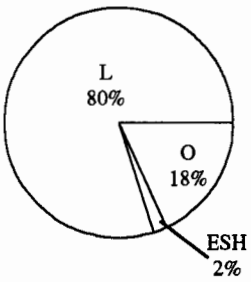
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Environmental Restoration	5,890	3,638	4,999	6,000	6,000	5,500	5,000
Total	5,890	3,638	4,999	6,000	6,000	5,500	5,000

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites.

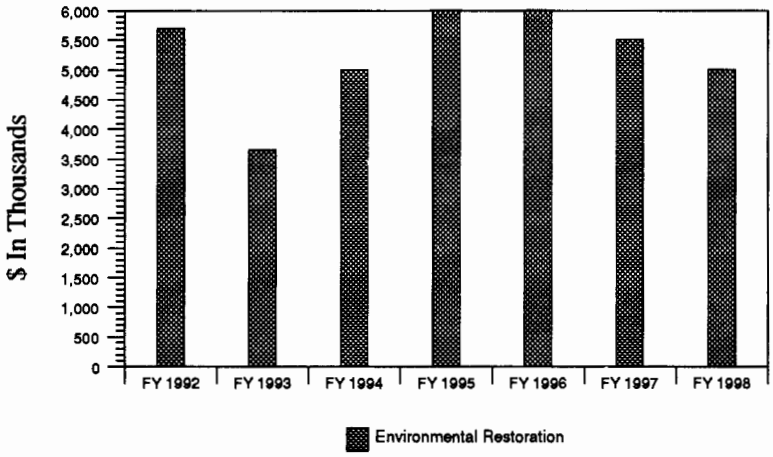
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



L- Legally Driven Requirements
ESH- Environment, Safety, and Health Requirements
O- Other Desirable Activities

Estimates by Year



For further information regarding Laboratory for Energy-Related Health Research, call (510) 273-6398.

SAN FRANCISCO FIELD OFFICE
INSTALLATION SUMMARY
LAWRENCE BERKELEY LABORATORY

DESCRIPTION

The 130-acre Lawrence Berkeley Laboratory (LBL) site is located on the western flank of Berkeley Hills adjacent to the University of California, Berkeley campus. The site is leased to DOE by the University of California and is bordered on the north by single-family residences and on the west by multifamily dwellings, student residence halls, and commercial buildings. A wide range of energy-related research activities, such as the operation of particle accelerators, chemistry and biomedical research laboratories, and supporting facilities, is carried out at LBL facilities. Waste management challenges for LBL include the renewal of the RCRA Part B Permit for waste handling, plans to construct a new and improved Hazardous Waste-Handling Facility (HWHF), development of Environment, Safety and Health staff to ensure safety of LBL operations, and protection of the environment. The principal environmental restoration programs at LBL involve the systematic assessment of soils and groundwater contamination, the investigation of remedial alternatives, and restoration of the site to acceptable levels of cleanliness. Other concerns include LBL's sanitary sewer system, a possible source of past soil contamination.

STRATEGIC OUTLOOK

LBL's considerable challenges in the areas of waste management and environmental restoration have prompted the development of aggressive, continuing programs that will provide for safe waste management operations, timely cleanup of soil and groundwater contaminated by past LBL operations, and enforcement of strict management controls to minimize possible environmental damage as a result of future operations.
LBL's waste management operations include waste pickup and transport to the on-site HWHF and repackaging and storage of hazardous, mixed, and low-level radioactive wastes in preparation for shipment to approved, off-site treatment, storage and disposal facilities. LBL is currently implementing a waste management staffing plan to enhance its ability to carry out waste-handling operations safely to preclude environmental degradation from releases of potentially hazardous materials. With the construction of the new, improved HWHF in FY 1995, LBL will consolidate all waste handling and monitoring activities in a well-designed facility with sufficient operational space to carry out its waste-handling operations.

LBL's Site Restoration Program, initiated in FY 1991, addresses all soils and groundwater contamination caused by past LBL operations. This program, currently in the assessment phase, will investigate contaminated areas, examine remedial alternatives, and eventually return the site to standards of cleanliness to be determined by negotiation with the State of California. Other activities will include RCRA closure of the old HWHF.
Corrective activities being implemented at LBL include installation of new equipment to recharge deionization columns and minimization of LBL waste, acquisition and installation of sewer monitoring equipment, removal or upgrades of underground storage tanks, and installation of air toxics monitoring equipment. When these corrective activities are implemented, LBL will continue to carry out its research mission for many decades, with an improved ability to protect the environment and the health and safety of LBL employees and the general public.

ACCOMPLISHMENTS (FY 1991 – 3Q FY 1992)

Corrective Activities

- Mitigation measures to control and equipment to measure airborne releases of hazardous materials under the Air Toxics Facility Assessment and Rehabilitation Project were initiated sitewide.
- Acquisition and installation of monitoring devices for the Sanitary Sewer Monitoring System was initiated.
- Existing deionization system was modified and upgraded to minimize heavy metal contamination.

Waste Management

- Preliminary design was completed for the new HWHF.
- Additional staff members were hired to operate the waste management and waste minimization programs in compliance with applicable Federal/State/local laws and regulations.
- Part B Permit submitted 4Q FY 1992 for operations at existing and replacement HWHF.

Environmental Restoration

- Preliminary assessment was completed for Environmental Monitoring Facilities.
- Phase I–Assessment of LBL's Sanitary Sewers system was completed.
- A draft RCRA Facility Assessment was completed.

SAN FRANCISCO FIELD OFFICE
PROGRESS CHART
LAWRENCE BERKELEY LABORATORY

Long-Term Objectives

Monitor and assess LBL operations to ensure against any significant threat to the environment.

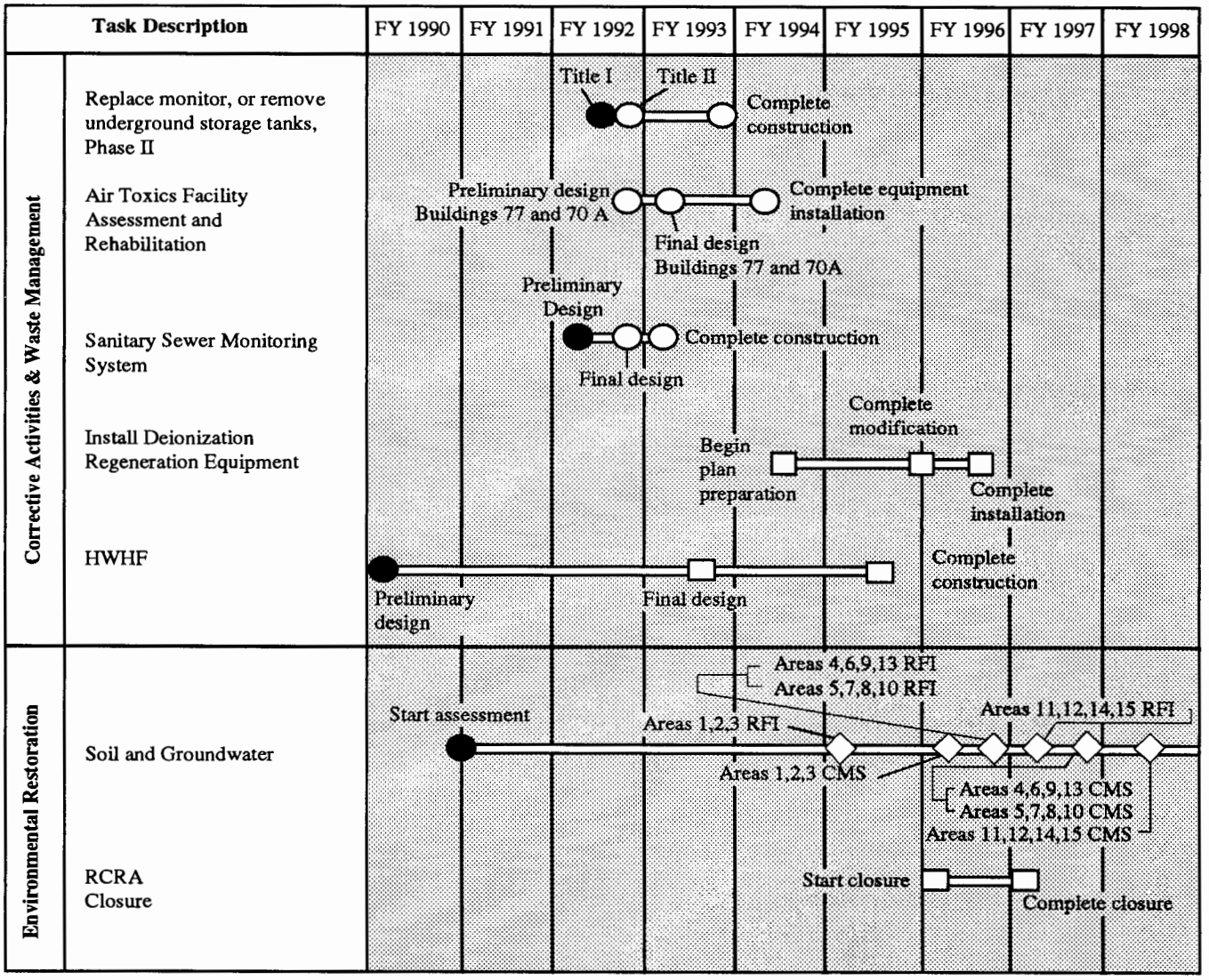
Manage waste handling operations in an environmentally sound and cost-effective manner.

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.



Milestone Types	Milestone Status
○ Unchanged from FY 1993-1997 FYP	○ ◇ □ Planned
◇ New since FY 1993-1997 FYP	● ◆ ■ Complete
□ Changed from FY 1993-1997 FYP	50 percent complete
	Information flow

Notes and Acronyms

BAAQMD-Bay Area Air Quality Management Division
CMS-Corrective Measures Study
FYP-Five-Year Plan
RFI-RCRA Facility Investigation

MAJOR MILESTONES

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
Corrective Activities			
• Complete final design for underground storage tank (UST) removal.	3Q FY 1992	4Q FY 1992[1]	CCR Title 23
• Complete construction for UST removal.	2Q FY 1993	3Q FY 1993[1]	CCR Title 23
• Complete Air Toxics Facility Assessment and Rehabilitation final design.	4Q FY 1992	2Q FY 1993[2]	40 CFR 61 EPA Admin Order
• Complete Air Toxics Facility Assessment and Rehabilitation construction.	4Q FY 1993	1Q FY 1994[2]	40 CFR 61 EPA Admin Order
• Complete Sanitary Sewer Monitoring System.	4Q FY 1993	4Q FY 1993	EBMUD Ord. 211
• Complete Deionization Regeneration Equipment installation.	3Q FY 1993	3Q FY 1993	EBMUD Ord. 270
• Begin Deionization Regeneration Equipment Waste Treatment.	New	1Q FY 1994	EBMUD Ord. 270
Waste Management			
• Complete Hazardous Waste-Handling Facility construction.	4Q FY 1992	3Q FY 1995[3]	40 CFR 260-267
Environmental Restoration			
• Complete Sitewide Assessment Remediation Investigation.	4Q FY 1992	Eliminated[4]	
• Complete Sitewide Assessment Feasibility Study.	2Q FY 1993	Eliminated[4]	
• Complete Sitewide Assessment Remediation Plan.	4Q FY 1993	Eliminated[4]	
• Complete Sitewide Assessment Monitoring and Sampling.	4Q FY 1993	Eliminated[4]	
• Complete Environmental Remediation preliminary design.	4Q FY 1994	Eliminated[4]	
• Complete Environmental Remediation final design.	2Q FY 1995	Eliminated[4]	
• Complete Environmental Assessment Remediation construction.	4Q FY 1997	Eliminated[4]	

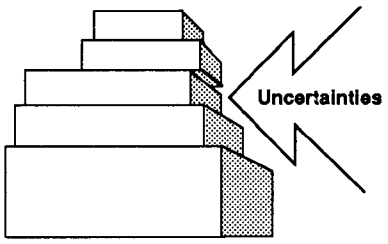
MAJOR MILESTONES (Continued)

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
• Complete RFI for Areas 1, 2, 3.	New	1Q FY 1995[4]	RCRA Sect. 3004(u)
• Complete RFI for Areas 5, 7, 8, 10.	New	4Q FY 1996[4]	RCRA Sect. 3004(u)
• Complete RFI for Areas 4, 6, 9, 13.	New	4Q FY 1996[4]	RCRA Sect. 3004(u)
• Complete RFI for Areas 11, 12, 14, 15.	New	2Q FY 1997[4]	RCRA Sect. 3004(u)
• Complete Corrective Measures Study for Areas 1, 2, 3.	New	1Q FY 1996[4]	RCRA Sect. 3004(u)
• Complete Corrective Measures Study for Areas 4 through 10 and 13.	New	4Q FY 1997[4]	RCRA Sect. 3004(u)
• Complete Corrective Measures Study for Areas 11, 12, 14, 15.	New	2Q FY 1998[4]	RCRA Sect. 3004(u)
• Complete Existing Hazardous Waste-Handling Facility Closure.	2Q FY 1993	3Q FY 1997[5]	RCRA Sect. 264

[1]Slipped because of project rescoping.
[2]Project was rescoped to include only air toxic corrective actions.
[3]Project was rescoped to accommodate operational upgrades.
[4]Project was rescoped to follow RCRA guidelines. A phased approached was taken, and the project life was subsequently extended.
[5]The closure of the existing Hazardous Waste Handling Facility has slipped because of the slippage in the construction schedule of the new Hazardous Waste Handling Facility.

CCR - *California Code of Regulations*
CFR - *Code of Federal Regulations*
EBMUD - East Bay Municipal Utilities District Ordnance

FIVE-YEAR PLAN ESTIMATES



There are a number of potential activities at the Lawrence Berkeley Laboratory (LBL) that may affect program requirements. These potential activities have not been included in the estimates below due to various uncertainties regarding scope of work, the phasing of regulatory reviews and approval schedules, availability of technology, lack of independent cost reviews and other factors. The nature and extent of construction at this site must be better defined, and regulatory approval of the RFI work plan are uncertainties at LBL. If further analysis of these uncertainties and potential additional work results in additional funding needs based on legal requirements, DOE will, through mechanisms such as reallocating budgetary resources, requesting funds through the normal appropriation process, supplemental requests or internal reprogramming, pursue funding for these activities, or where appropriate, based on technical reasons, enter into the formal conflict resolution process with regulatory bodies.

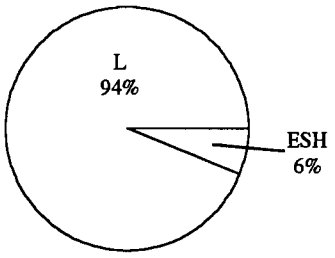
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Corrective Activities/Waste Management	12,372	6,683	14,872	7,067	7,104	7,145	7,155
Environmental Restoration	1,503	2,700	3,261	3,706	6,175	6,372	4,593
Total	13,875	9,383	18,133	10,773	13,279	13,517	11,748

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites.

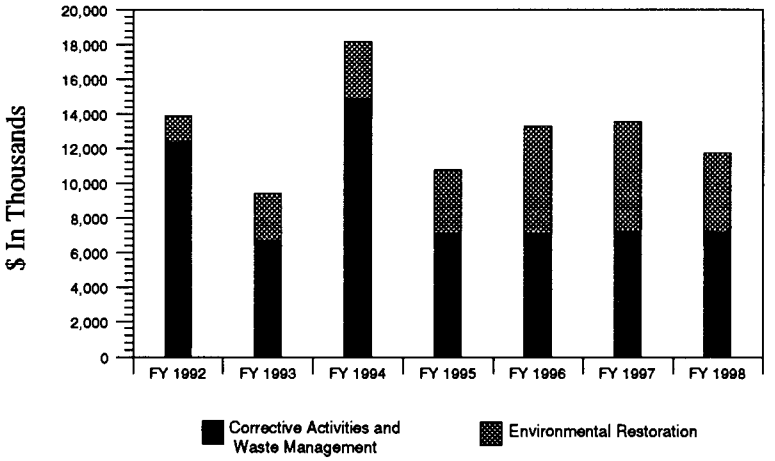
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



L- Legally Driven Requirements
ESH- Environment, Safety, and Health Requirements

Estimates by Year



For further information regarding Lawrence Berkeley Laboratory, call (510) 273-6398.

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SAN FRANCISCO FIELD OFFICE
INSTALLATION SUMMARY
LAWRENCE LIVERMORE NATIONAL LABORATORY

DESCRIPTION

The Lawrence Livermore National Laboratory (LLNL) main site is an approximately one-square-mile facility located on flat land in the Livermore - Amador Valley, approximately 40 miles east of San Francisco, on the eastern border of the city of Livermore. This site has an interim status RCRA Part B Permit for a treatment, storage, and disposal facility for hazardous, mixed, and low-level waste. Past operations involving the handling and storage of hazardous materials at the Main Site have resulted in the release and subsequent migration of contaminants into soil and groundwater. There are nonnuclear explosive test facilities at Site 300, located approximately 15 miles east of the main site. A permitted TSDF (used for storage of hazardous waste only) is located at this site. Past operations at Site 300 involving processing, testing, and deactivating high explosive materials have resulted in soil and groundwater contamination at the facility. Federal Facilities Agreements are in place for both the LLNL Main Site and Site 300. Both sites have aboveground and underground wastewater and petroleum tanks.

STRATEGIC OUTLOOK

LLNL has an Environmental Protection Department that integrates all LLNL programs to help ensure that environmental regulations are interpreted and applied consistently and appropriately for each operation. Significant environmental issues or action plans are carried by the Environmental Protection Department to the Laboratory's Environmental, Safety, and Health Council to ensure that all segments of the Laboratory are aware of the issues and help to integrate the solutions into the LLNL community. The environmental program at LLNL includes waste management, waste minimization, corrective actions, environmental restoration, and environmental technology development. All environmental activities focus on ensuring that LLNL meets all applicable DOE Orders related to environmental, safety, and health requirements, as well as Federal, State, and local regulations. The primary site-specific drivers affecting waste management programs are the Interim Status Document issued by the State of California (governing hazardous waste); a February 7, 1991, letter from Alameda County notifying LLNL that it considers all LLNL tanks to be regulated by the county; three Tiger Team findings for tank and transformer issues; and the Wastewater Discharge Permit and DOE's sewer service contract with the city of Livermore. Future activities at LLNL will continue to be diverse research operations requiring a complex sanitary sewer system, wastewater retention and petroleum tank system, waste minimization, and treatment, storage, and disposal activities. The environmental restoration activities include the environmental investigation, characterization, and cleanup of contaminants released to the environment at the Main Site and Site 300, both of which have been listed on the CERCLA National Priorities List. The primary regulatory drivers attending environmental restoration activities are separate Federal Facility Agreements (FFA) for each facility.

The main site, originally a U.S. Navy airfield that has been in operation for more then 50 years, has an old and deteriorating sewer system that must be rehabilitated to eliminate infiltration of rainwater and the possible release of sanitary and industrial wastewaters. Building sewer lines must also be investigated to ensure that lines are properly connected to the sanitary sewer, storm sewer, or retention tanks, as appropriate. In addition, both sites have wastewater and petroleum underground tank systems and aboveground petroleum tanks and transformers that must be upgraded to achieve full compliance with State and Federal regulations.

STRATEGIC OUTLOOK (Continued)

The planned activities for hazardous waste management include the development of necessary documents and characterization systems to allow the shipment of radioactive waste to the Nevada Test Site. In addition, technology will be tested and implemented to improve the treatment of radioactive and mixed aqueous waste, and new techniques will be developed and implemented to treat nonaqueous radioactive and mixed waste. The waste minimization program activities will include creation and distribution of a waste minimization guideline and the establishment of global contracts for transportable treatment units to allow sewering of some retention tanks.

The LLNL Main Site was placed on the National Priorities List in 1987. At the Livermore Main Site, chlorinated hydrocarbons are dissolved in groundwater at concentrations as high as ten parts per million. In addition, there is one monitoring well on-site with tritium concentrations slightly above the drinking water standard. The entire plume of contaminated groundwater at the main site covers approximately 1 1/4 square miles. There is also a fuel hydrocarbon leak from an old underground storage tank that released an estimated 17,000 gallons of gasoline. The groundwater will be remediated by pumping and treating all the water within the area of the contaminated plume so that no contaminants will be allowed to pass through the area of the plume without being drawn into one of the extraction wells. The extracted groundwater will then be treated at one of seven treatment facilities. Current plans propose treating the groundwater to remove solvents and fuel hydrocarbons and possibly lead and chromium so that the treated water will meet drinking water standards. The level of tritium in the groundwater will decay to levels below drinking water standards before it leaves the site boundary. The treated water will be discharged to surface drainage or will be reinjected into the aquifer to facilitate cleanup.

Site 300 was placed on the National Priorities List in August 1990, and an FFA has been negotiated among DOE, the Regional Water Quality Control Board, California Department of Toxic Substances Control and the EPA Region IX. This FFA requires the completion of a Sitewide Remedial Investigation for Site 300 before the submittal of individual operable units' (OU's) Feasibility Studies, Proposed Plans, Records of Decisions, Remedial Action Plans, and Remedial Design documents. Six separate OUs were identified in the FFA. Initiation of final remedial actions will not occur until after the approval of the above documents. Under the terms of the FFA, removal actions will be undertaken at the Eastern and Central General Services Area and on two landfills closed in the late 1980s. In addition, current plans are to close the High-Explosive Burn Pits in FY 1994.

At the Livermore Site 300, several small plumes of chlorinated hydrocarbons and two plumes of tritium in the groundwater exist. The groundwater with the tritium plume is moving very slowly, and current modeling indicates that it will be below the background levels for tritium before the groundwater reaches the border of the site. At the Building 834 area, a plume of trichloroethylene is present at very high concentrations, but it is confined to a perched aquifer. Two sites in the general services area, OU 1, have been identified as areas to be remediated to limit the further spread of trichloroethylene off-site. In the Eastern General Services Area an interim groundwater treatment facility is extracting and treating trichloroethylene contaminated groundwater in the alluvial aquifier, while in the Central General Services Area, an interim treatment facility is planned for the extraction and treatment of trichloroethylene-contaminated groundwater from an inactive dry well near the southern border of the site.

ACCOMPLISHMENTS (FY 1991 – 3Q 1992)

Corrective Activities

- Conceptual Design Reports were finalized in March 1990 for the Tank System Upgrades and Sanitary Sewer Rehabilitation Corrective Activities Line Items.
- Project Management Plans have been prepared and are currently in review for the Tank System Upgrades and Sanitary Sewer Rehabilitation Corrective Activities Line Items.
- Under the FY 1990 Environmental Safety and Health Corrective Action Line Item project that preceded the FY 1992 Tank Upgrades Corrective Activities Line Item, 55 tank system correction projects have been completed and 14 are in progress.
- The requisition package for the video inspection of sanitary sewer lines bidding was prepared for procurement.
- Nearly 10,000 linear feet of sewer mains have been restored using inversion-lining. Another 10,000 linear feet of pipe have been videotaped.
- Building sewer lines in 14 buildings have been dye-tested and documented to date. Options are being investigated to determine the best method for uniquely numbering each drain orifice.
- Twelve people were assigned to the Building Sewer Line Investigation Project, and work is in progress to establish a total of 25 teams (50 to 100 people). EPD field technicians were assigned to monitor and coordinate the field efforts, and an EPD environmental analyst is managing the project.

Waste Management

- Inspection of the treatment, storage, and disposal facility by the State of California in early 1991 found very few problems, all of which have been subsequently corrected.
- Criteria and procedures were written, approved, and implemented to satisfy the requirements of the DOE "Performance Objective for Certification of Nonradioactive Hazardous Waste."
- Completed closure of the existing incinerator.
- Achieved full implementation of the Waste Inventory System.
- Developed Transportable Treatment Unit contract for some aqueous waste streams.
- Initiated a nonhazardous solvent recycling program.

ACCOMPLISHMENTS (Continued)

Environmental Restoration

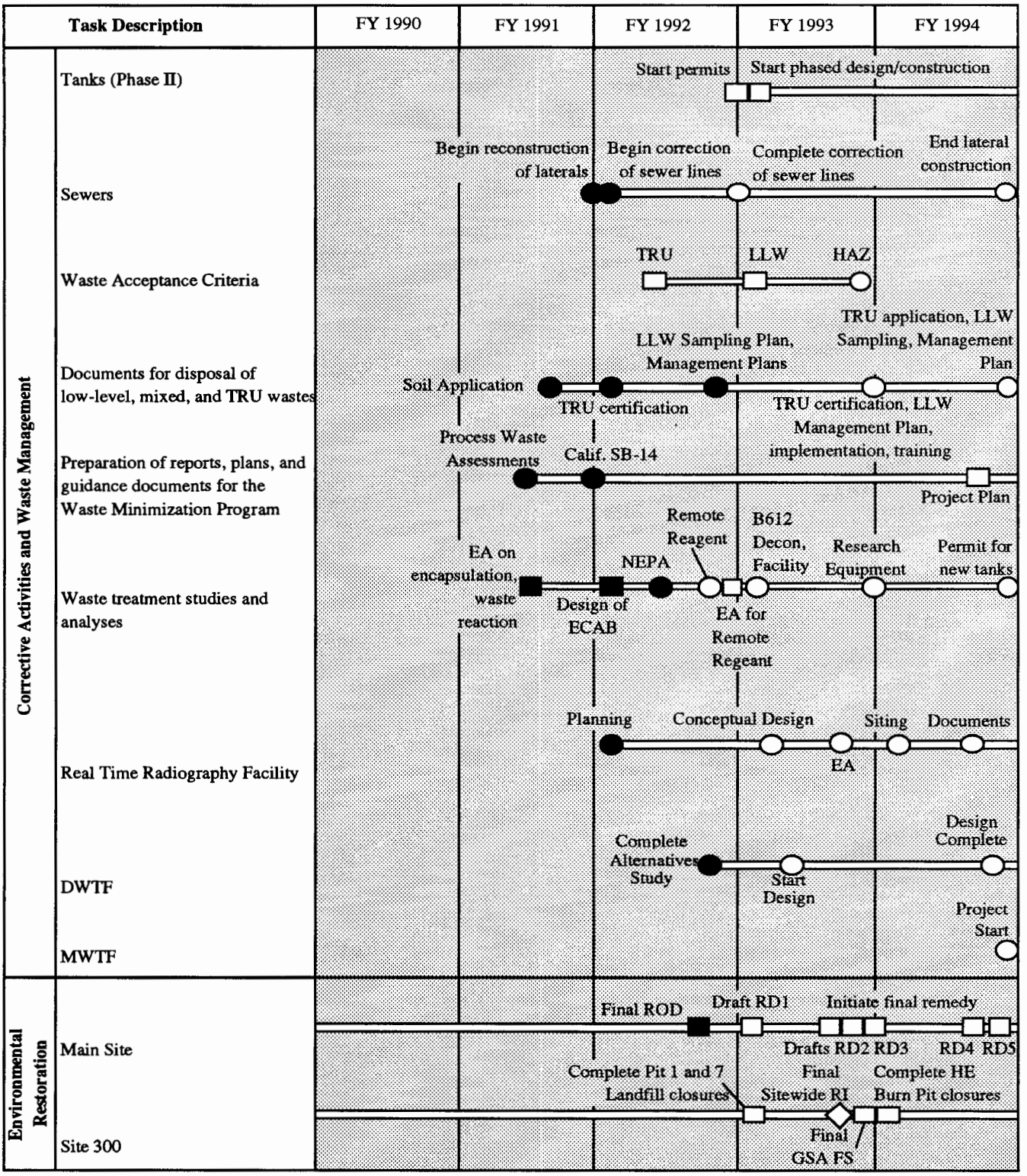
Main Site

- Completed and submitted the following primary documents:
  - Feasibility Study (FS)
  - Proposed Remedial Action Plan
  - Record of Decision (ROD)
  - Draft Remedial Action Implementation Plan
- Proposed Remedial Action Plan Public Meeting was held on November 6, 1991.
- Treated approximately 35 million gallons of groundwater at treatment facilities A and B to date.
- Approximately 2200 gallons of liquid equivalent of gasoline vapors were removed to date from the soil in gasoline spill area by vacuum-induced venting.
- Completed installation of the Drainage Retention Basin lining.
- Completed the Phase I source investigation at TR5475 area.

Site 300

- Completed the following preliminary documents:
  - Draft B833 Area Remedial Investigation Report
  - Draft Pit 6 FS Report
  - Draft B834 Area FS Report
  - Draft B850 Area/EFA FS Report
  - Draft Quality Assurance Project Plan
  - Building 801 Area Tank Closure Report
  - Standard Operating Procedures
  - Well Log Report
  - Four Environmental Investigation Quarterly Reports
- Installed and operated the Eastern GSA groundwater treatment unit.
- EPA and California EPA approved the closure plan for capping RCRA landfill Pits 1 and 7.
- Construction contract awarded for the closure of RCRA landfill Pits 1 and 7.

SAN FRANCISCO FIELD OFFICE
PROGRESS CHART
LAWRENCE LIVERMORE NATIONAL LABORATORY



Long-Term Objectives

Bring the facility into compliance with applicable laws and regulations.

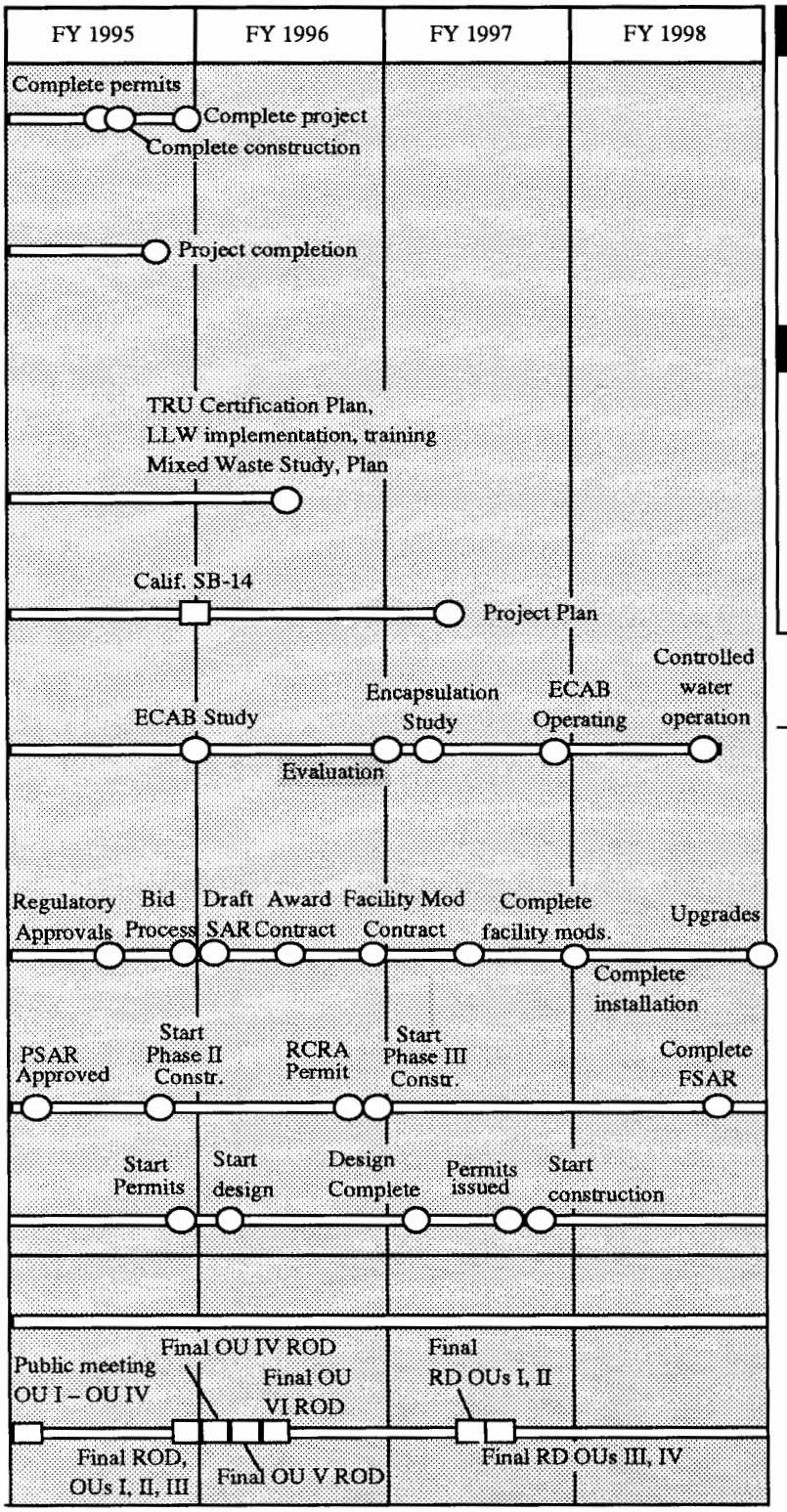
Manage waste in an environmentally sound and effective manner.

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.



Milestone Types

- Unchanged from FY 1993–1997 FYP
- New since FY 1993–1997 FYP
- Changed from FY 1993–1997 FYP

Milestone Status

- Planned
- Complete
- 50 percent complete
- Information flow

Notes and Acronyms

DWTF - Decontamination and Waste Treatment Facility
EA - Environmental Assessment
ECAB - Evaporation Centrifugation Absorption Blending
EIS - Environmental Impact Statement
FS - Feasibility Study
FSAR - Final Safety Assessment Report
FYP - Five-Year Plan
GSA - General Services Area
HAZ - Hazardous Waste
HE - High Explosive
LLW - low-level waste
MWTF - Mixed Waste Treatment Facility
NEPA - National Environmental Policy Act
PSAR - Preliminary Safety Assessment Report
SAR - Safety Analysis Report
TRU - Transuranic

MAJOR MILESTONES

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Drivers
Corrective Activities			
• Receive approval of tank permits (phased).	1Q FY 1993	4Q FY 1994[1]	40 CFR 264, 265, 280
• Receive approval of tank and transformer design (phased packages).	2Q FY 1994	2Q FY 1995[1]	40 CFR 264, 265, 280
• Complete tank/transformer bid/award (multiple packages).	New	2Q FY 1995	40 CFR 264, 265, 280
• Complete tank/transformer construction.	New	3Q FY 1995	40 CFR 264, 265, 280
• Tank/transformer activation/completion (multiple packages).	New	4Q FY 1995	40 CFR 264, 265, 280
• Complete inversion lining/replacement.	New	1Q FY 1995[2]	40 CFR 264, 265, 280
• Complete closed circuit television inspection of sanitary sewer mains and laterals.	New	4Q FY 1994	Porter Cologne Water Quality Act
• Complete investigation and correction of building laterals.	New	4Q FY 1992	Porter Cologne Water Quality Act, State of California
Waste Management			
• Quantify solid, nonhazardous waste streams for waste minimization activities.	New	4Q FY 1992	DOE Order 5400.1
• Publish and distribute Waste Minimization Guidance Document.	New	4Q FY 1992	DOE Order 5400.1
• Revise waste acceptance criteria.	New	2Q FY 1993	DOE Order 5820.2A
• Conduct analysis of treated waste.	New	4Q FY 1993	40 CFR 263
• DOE Waste Minimization Plan updated and Annual Report submitted.	New	3Q FY 1994	DOE Order 5400.1
• Complete documents required for disposal of low-level, mixed and TRU waste.	New	4Q FY 1995	DOE Order 5820.2A
• Plan, construct, and operate high-explosive storage facility at Site 300.	New	4Q FY 1995	40 CFR 265

MAJOR MILESTONES (Continued)

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Drivers
• Implement enhanced computer tracking of waste.	New	4Q FY 1996	LLNL Interim Status Document
• Installation and operation of a real-time radiography facility.	New	4Q FY 1996	DOE Order 5820.2A
Environmental Restoration			
Main Site			
• ROD.	1Q FY 1991	4Q FY 1992[4]	FFA
• Draft Remedial Action Implementation Plan (RAIP).	New	4Q FY 1992	FFA
• Final Draft RAIP.	New	1Q FY 1993	FFA
• RAIP.	New	1Q FY 1993	FFA
• Draft RD/RA.	New	1Q FY 1993	FFA
• Initiate final Main Site remedy.	New	3Q FY 1993	FFA
• Draft RD 2	New	3Q FY 1993	FFA
• Draft RD 3	New	4Q FY 1993	FFA
• Draft RD 4	New	3Q FY 1994	FFA
• Draft RD 5	New	3Q FY 1994	FFA
Site 300[3]			
• Initiate central GSA removal action.	New	1Q FY 1993	FFA
• Complete Pit 1 & 7 landfill closures.	1Q FY 1992	1Q FY 1993	FFA
• Site 300-wide Remedial Investigation.	New	2Q FY 1993	FFA
• Final GSA FS (OU I).	4Q FY 1991	4Q FY 1993	FFA
• Final Building 834 Area FS (OU II).	4Q FY 1991	1Q FY 1994	FFA
• Final Landfill Pit 6 (OU III) FS.	4Q FY 1991	1Q FY 1994	FFA
• Final Firing Areas FS (OU V).	4Q FY 1992	2Q FY 1994	FFA
• Final OU6 (B833 Area, etc.) FS.	2Q FY 1992	2Q FY 1994	FFA

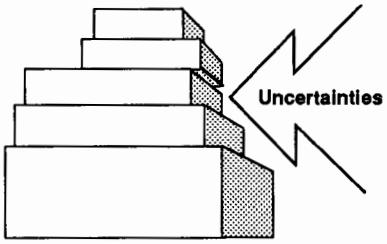
MAJOR MILESTONES (Continued)

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Drivers
• Complete High Explosive Burn Pit closures.	1Q FY 1994	1Q FY 1995	FFA
• Public Meeting for OUs I–IV.	New	1Q FY 1995	FFA
• Final OU I ROD (Gasoline Spill Area).	3Q FY 1992	4Q FY 1995	FFA
• Final OU II ROD (Building 834).	3Q FY 1992	4Q FY 1995	FFA
• Final OU III ROD (Pit 6).	4Q FY 1992	4Q FY 1995	FFA
• Final OU IV ROD (HE Process Area).	4Q FY 1992	1Q FY 1996	FFA
• Final OU V ROD (B801/B865).	4Q FY 1993	2Q FY 1996	FFA
• Final OU VI ROD (B833).	4Q FY 1993	3Q FY 1996	FFA
• Final HE Process Area FS (OU IV).	2Q FY 1992	1Q FY 1994	FFA
• Final OU I ROD (Gasoline Spill Area).	1Q FY 1993	2Q FY 1997	FFA
• Final OU II ROD (B-834).	1Q FY 1993	2Q FY 1997	FFA
• Final OU III ROD (Pit 6).	2Q FY 1993	3Q FY 1997	FFA
• Final OU IV ROD (High-Explosive Process Area).	1Q FY 1993	3Q FY 1997	FFA

[1]Delayed to allow time to evaluate the applicability of DOE requirements prior to the release of funds.
[2]Milestone not included in previous Program Summary Document. Funding available for FY 1992.
[3]Site 300 Environmental Restoration milestones delayed because of requirement for a sitewide remedial investigation.
[4]Delayed in order to extend the public comment period for the proposal remedial action plan.

CFR - *Code of Federal Regulations*

FIVE-YEAR PLAN ESTIMATES



There are a number of potential activities at the Lawrence Livermore National Laboratory (LLNL) that may affect program requirements. These potential activities have not been included in the estimates below due to various uncertainties regarding scope of work, the phasing of regulatory reviews and approval schedules, availability of technology, lack of independent cost reviews and other factors. Uncertainties at LLNL are in part due to the biofiltration project at Site 300. If further analysis of these uncertainties and potential additional work results in additional funding needs based on legal requirements, DOE will, through mechanisms such as reallocating budgetary resources, requesting funds through the normal appropriation process, supplemental requests or internal reprogramming, pursue funding for these activities, or where appropriate, based on technical reasons, enter into the formal conflict resolution process with regulatory bodies.

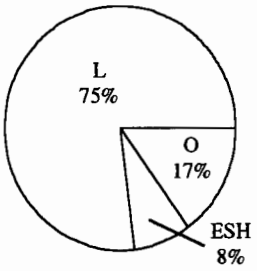
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Corrective Activities/Waste Management	43,795	62,958	39,228	42,493	46,589	51,094	51,918
Environmental Restoration	26,218	36,450	30,279	25,327	24,864	23,356	22,260
Facility Transition	0	1,400	0	0	0	0	0
Total	70,013	100,808	69,507	67,820	71,453	74,450	74,178

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites.

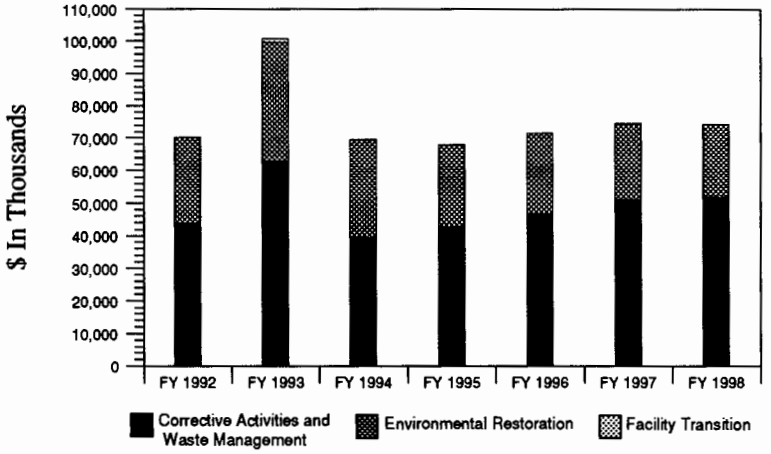
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



L- Legally Driven Requirements
ESH- Environment, Safety, and Health Requirements
O- Other Desirable Activities

Estimates by Year



For further information regarding Lawrence Livermore National Laboratory, call (510) 273-6398.

SAN FRANCISCO FIELD OFFICE
INSTALLATION SUMMARY
SANTA SUSANA FIELD LABORATORY

DESCRIPTION

The Santa Susana Field Laboratory (SSFL), consisting of a total of 2700 acres is located in the Simi Hills of Ventura County, approximately 30 miles northwest of downtown Los Angeles, California. DOE operations are conducted in Rockwell International-owned and DOE-owned facilities on a 290-acre site. The Energy Technology Engineering Center (ETEC) portion of the SSFL consists of government-owned buildings that occupy 90 acres of the 290-acre site. The Rockwell facilities include former fabrication facilities, a hot cell, a reactor test building, a storage vault, an on-site transport cask, and other radiologically contaminated support laboratories and areas. The ETEC facilities are used to test nonnuclear 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 that establishes State oversight to ensure environmental compliance.

STRATEGIC OUTLOOK

ETEC is implementing DOE guidance to comply with environmental legislation as major objectives for environmental restoration activities and waste management operations. At this time, transition planning activities to ensure an orderly transition of surplus contaminated facilities for D&D are projected to begin in FY 1993 at ETEC. Several facilities have been identified for potential D&D. All the D&D activities and supporting waste management operations are planned for completion in FY 1998.

Waste management operations at ETEC include the disposal of radioactive and mixed waste and surplus sodium, corrective activities at the Sodium Components Test Installation, Tiger Team waste-management-related activities; and continuity of operations.

- Disposal of surplus sodium consists of treating the surplus liquid metal at the Hazardous Waste Materials Facility (HWMF) in accordance with a "Consent Agreement" between Rockwell and the State of California. This treatment and disposal at the HWMF is planned for completion in FY 1994. However, this date may slip if additional quantities of sodium are declared surplus and must be treated as hazardous waste.
- Continuity of operations, performed in compliance with RCRA permitting requirements, includes waste characterization and certification, waste minimization, waste packaging, and off-site disposal. Those activities performed at the Radioactive Material Disposal Facility (RMDF) are scheduled to be completed in FY 1997. At that time, D&D of RMDF will have been accomplished and RMDF will have been released back to Rockwell for use without radiological restrictions.
- Tiger Team waste management corrective actions consist of developing a waste minimization plan, upgrading the RMDF stack sampling system, and designing and installing a hazardous waste collection system. The corrective activities are planned for completion in FY 1994. Corrective activities at the Sodium Components Test Installation will be completed by the end of FY 1992.

STRATEGIC OUTLOOK (Continued)

Environmental restoration operations consist of Remedial Action, D&D, and Program Management activities:

- Remedial Action includes development and implementation of a comprehensive sitewide characterization plan following RCRA guidelines. Ongoing site characterization consists of assessments of radioactive contaminants as well as chemical pollutants in surface water and groundwater, soil, biota, and air. A portion of the site has been characterized and specific remedial and D&D activities are under way.
- D&D programs include surveillance and maintenance, assessments, decontamination, and final release by FY 1996 of a number of facilities that were used to support government-funded nuclear programs.

ACCOMPLISHMENTS (FY 1991 – 3Q FY 1992)

Waste Management

- Completed treatment and disposal of eighteen 55-gallon drums of liquid metal waste (sodium).
- Disposed and treated 11 of the 14 cold traps.
- Disposed of all lithium-hydride.
- Submitted RCRA Part B Permit renewal for HWMF.
- Restablished shipping authority to Hanford.

Environmental Restoration

- Completed removal of vacuum vessel from Building 059.
- Completed closure plans for the Sodium Disposal Facility, submitted plans for agency approval, and initiated remediation.
- Constructed six off-site groundwater wells near RMDF and Building 886.
- Completed a significant portion of site characterization related to the sources of pollution (Solid Waste Management Units).

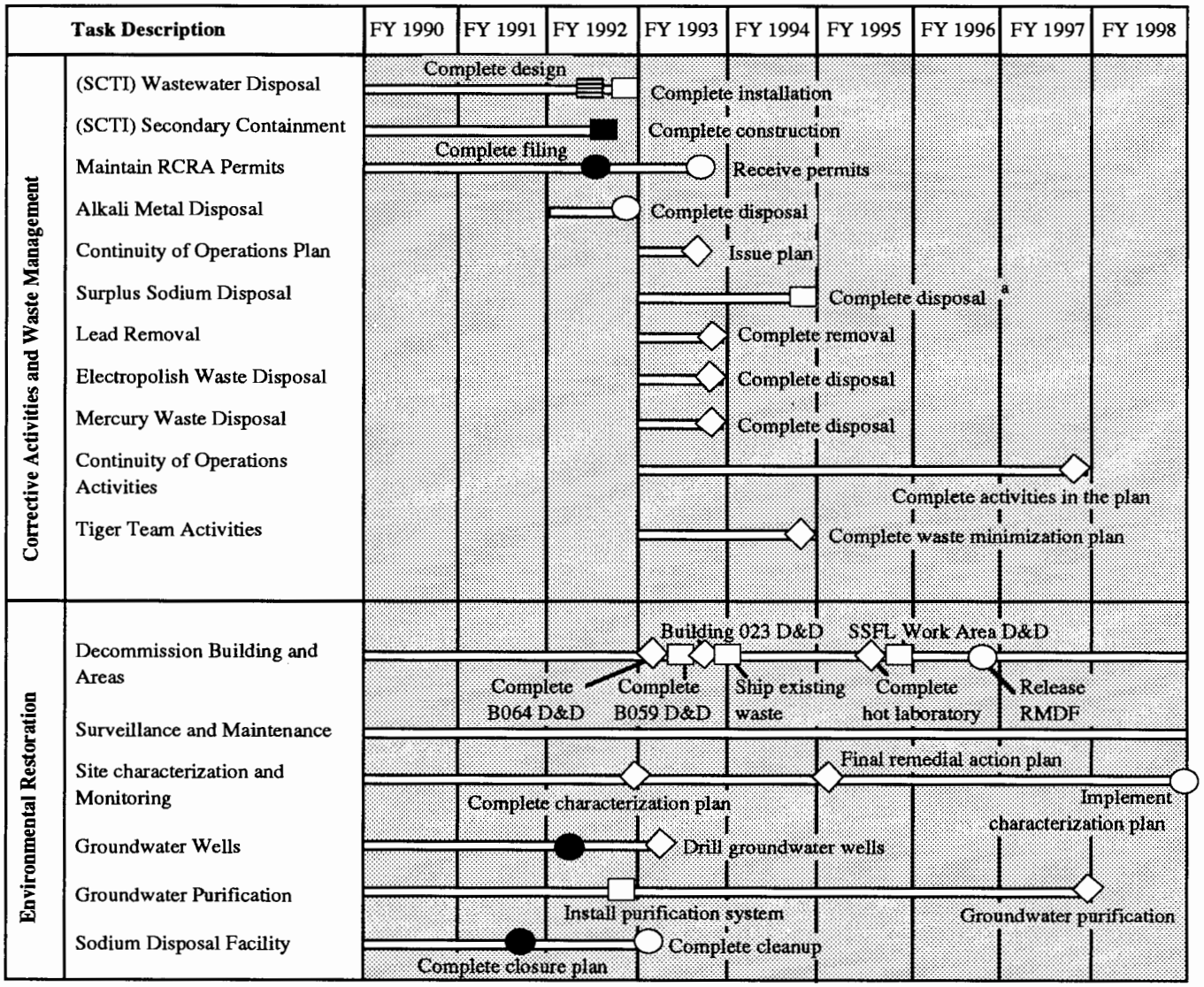
SAN FRANCISCO FIELD OFFICE
PROGRESS CHART
ENERGY TECHNOLOGY ENGINEERING CENTER

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 ETEC.
Complete disposal of all surplus hazardous materials at ETEC.
Complete all remedial actions and installation of monitoring systems with purification systems in place and operating.
Complete Corrective Activities and maintain compliance.



Milestone Types

- ○ Unchanged from FY 1993–1997 FYP
- ◇ New since FY 1993–1997 FYP
- □ Changed from FY 1993–1997 FYP

Milestone Status

- ○◇□ Planned
- ●◆■ Complete
- ◍◈▤ 50 percent complete
- – – – ► Information flow

Notes and Acronyms

[a] Milestone may slip if additional sodium is declared surplus and requires management as hazardous waste

D&D - decontamination and decommissioning
ETEC - Energy Technology Engineering Center
FYP - Five-Year Plan
RMDF - Radioactive Materials Disposal Facility
SCTI - Sodium Component Test Institution
SSFL - Santa Susana Field Laboratory

MAJOR MILESTONES

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
Corrective Activities			
• Complete SCTI wastewater disposal system.	2Q FY 1992	4Q FY 1992[1]	RCRA Sect. 3004 & NPDES
Waste Management			
• Complete cold trap disposal.	3Q FY 1991	4Q FY 1992[2]	RCRA Sect. 3004
• Complete disposal of alkali metal.	4Q FY 1992	4Q FY 1992	RCRA Sect. 3004
• Complete amalgamation and disposal of mercury waste.	New	4Q FY 1993	DOE Order 5400.3
• Complete removal of lead materials.	New	4Q FY 1993	DOE Order 5400.3
• Complete disposal of electropolish waste.	New	4Q FY 1993	DOE Order 5400.3
• Prepare "Continuity of Operations" plan.	New	4Q FY 1994	DOE Order 5820.2A & 5400.5
• Issue Waste Minimization Plan.	New	3Q FY 1994	DOE Order 5400.3
• Complete disposal of surplus sodium.	3Q FY 1994	4Q FY 1994[1]	Consent Agreement
• Complete activities in the "Continuity of Operations" plan.	New	4Q FY 1997	DOE Order 5820.2A & 5400.3
Environmental Restoration			
• Issue Final Site Characterization Plan.	New	4Q FY 1992	RCRA
• Complete groundwater purification system installation.	3Q FY 1992	4Q FY 1992[3]	RCRA Sect. 3004(u)
• Complete sodium disposal facility cleanup.	4Q FY 1992	1Q FY 1993[4]	RCRA Sect. 3004(u)/TPCA
• Complete D&D of Hot Cell and Decon rooms (Building D20 - Hot Lab).	New	4Q FY 1992	NRC License
• IVC/DOE Release of Building 064.	New	1Q FY 1993	DOE Order 5820.2A

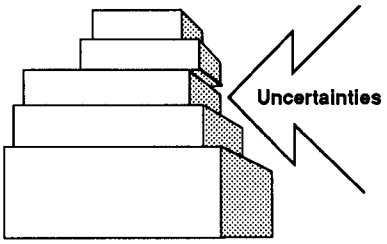
MAJOR MILESTONES (Continued)

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
• IVC/DOE Release of Building 059.	4Q FY 1992	2Q FY 1993[5]	DOE Order 5820.2A
• Complete B/005 D&D (IVC/DOE Release).	4Q FY 1992	2Q FY 1993[3]	DOE Order 5820.2A
• IVC/DOE Release of Building 023.	New	4Q FY 1993	DOE Order 5820.2A
• Submit Final NEPA documents for site remediation for DOE approval.	New	3Q FY 1994	NEPA Sect. 120
• Complete D&D of Basement (Hot Lab).	New	3Q FY 1994	NRC License
• Submit Final Sitewide Remedial Action Plan.	New	1Q FY 1995	RCRA
• Complete demolition of Hot Lab.	New	3Q FY 1995	NRC License
• Complete D&D of Building 022 (RMDF).	New	4Q FY 1995	DOE Order 5820.2A
• Complete SSFL work areas D&D (B/056).	4Q FY 1992	4Q FY 1995[3]	RCRA Sect. 3004(u)
• Release of B/056 landfill.	New	1Q FY 1996	RCRA Sect. 3004(u)
• Independent Verification Control/DOE release of RMDF.	4Q FY 1996	4Q FY 1996	DOE Order 5820.2A

[1]Delays caused by added work scope.
[2]Delays caused by unsuccessful efforts to refurbish three cold traps, which will now be disposed of.
[3]Schedule delay caused by reprioritization.
[4]Delays caused by California-EPA and Regional Water Quality Control Board's delay of approval of the Closure Plan.
[5]Schedule delays caused by equipment failures.

Consent Agreement - Between California and Rockwell under State Health and Safety Order
D&D-decontamination and decommissioning
IVC-Independent Verification Control
NEPA-National Environmental Policy Act
NPDES - National Pollutant Discharge Elimination System
NRC - Nuclear Regulatory Commission
RMDF-Radioactive Material Disposal Facility
SCTI-Sodium Component Test Institution
TPCA - Toxic Pit Cleanup Act (State of California)

FIVE-YEAR PLAN ESTIMATES



There are a number of potential activities at Santa Susana Field Laboratory (SSFL) that may affect program requirements. These potential activities have not been included in the estimates below due to various uncertainties regarding scope of work, the phasing of regulatory reviews and approval schedules, availability of technology, lack of independent cost reviews and other factors. Uncertainties at SSFL are in part related to soil and groundwater cleanup and perimeter soil cleanup at the Radioactive Materials Disposal Facility. If further analysis of these uncertainties and potential additional work results in additional funding needs based on legal requirements, DOE will, through mechanisms such as reallocating budgetary resources, requesting funds through the normal appropriation process, supplemental requests or internal reprogramming, pursue funding for these activities, or where appropriate, based on technical reasons, enter into the formal conflict resolution process with regulatory bodies.

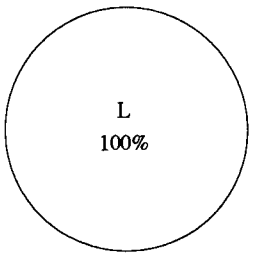
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Corrective Activities/Waste Management	4,301	571	100	571	571	571	571
Environmental Restoration	12,790	5,707	6,500	9,000	6,117	2,355	1,719
Total	17,091	6,278	6,600	9,571	6,688	2,926	2,290

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites.

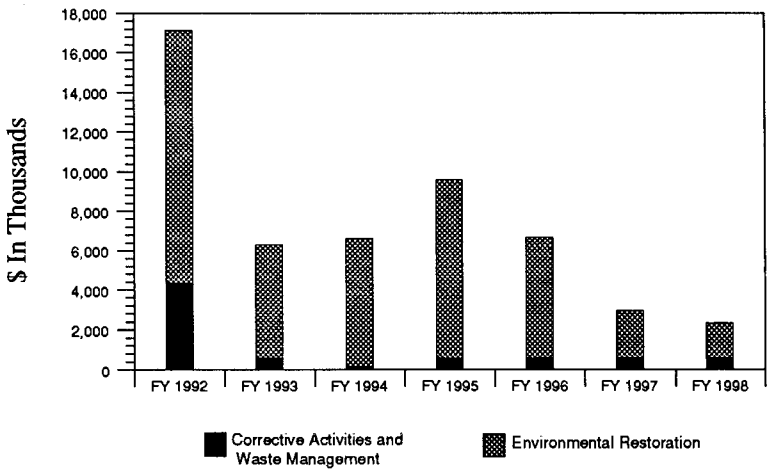
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



L- Legally Driven Requirements

Estimates by Year



For further information regarding Santa Susana Field Laboratory, call (510) 273-6398.

SAN FRANCISCO FIELD OFFICE
INSTALLATION SUMMARY
STANFORD LINEAR ACCELERATOR CENTER

DESCRIPTION

The Stanford Linear Accelerator Center (SLAC) is operated by Stanford University under contract to DOE. The 426-acre site is located on the San Francisco Peninsula between San Francisco and San Jose, California. SLAC, established in 1962, is an energy research facility dedicated to research and development of new techniques for high-energy accelerators and experimental apparatus.

Past waste management practices and facility operations have resulted in polychlorinated biphenyl (PCB) contamination of soils and volatile organic compound contamination of groundwater, which will require assessment and remediation.

STRATEGIC OUTLOOK

The activities and projects set forth in the SLAC Environmental Restoration and Waste Management Five-Year Plan are intended to correct practices that may lead to degradation of the environment if continued; to restore the environment where degradation has occurred; to minimize waste; to continue safe and effective waste management operations; and to ensure that present practices will protect the environment in the years ahead.

SLAC generates both hazardous wastes and a small amount of radioactive waste. These wastes are regulated at both the State and Federal levels: the RCRA/Hazardous and Solid Waste Amendments (HSWA) program for hazardous waste is under the purview of EPA, Region IX, and the State of California Department of Toxic Substances Control; the California Department of Toxic Substances Control also has jurisdiction over certain state-regulated hazardous wastes; and radioactive waste is under the purview of DOE. The facility is regulated by the State of California-EPA as a generator of hazardous waste. As dictated by current regulations, the hazardous wastes generated by SLAC are stored on-site for a period less than 90 days before off-site shipment for disposal at approved DOE facilities that are in compliance with EPA regulations. The types and volumes of hazardous waste generated at SLAC are operations-dependent. Fairly constant waste streams include waste oils from machine shops, motor pool, pumps, and compressors; waste solvents from various degreasers, assembly shops and "clean" operations; PCB-contaminated oils and PCB capacitors from various operations; sludge from the treatment facility; aqueous liquids with metals from metal-cleaning activities; and soil contaminants, clothing, and asphalt from the cleanup of spills and leaks.

STRATEGIC OUTLOOK (Continued)

Preliminary assessment has identified eight sites requiring further investigation:

1. Interaction Region 6 and 8 Drainage Ditches (includes off-site contaminated areas)
2. Former Leaking Underground Storage Tank Site
3. Sitewide Groundwater Assessment
4. 3.0 megawatt Power Supply (Former PCB Spill/Cleanup Project)
5. Interaction Region and Power Supply Contaminated Soil
6. Master Substation Contaminated Soil (inactive area)
7. Hazardous Waste Storage Area
8. Substation 505 Power Supply Contaminated Soil

Additional sites may be identified as a result of completion of a sitewide preliminary assessment/site inspection being conducted by Energy Research as part of the Landlord Program for SLAC.

ACCOMPLISHMENTS (FY 1991 – 3Q FY 1992)

Hazardous Waste Disposal Program

- Set up a computerized tracking system for drum containers.
- Set up a uniform labeling system for drum containers.
- Accomplished remediation and disposal of contaminated soil at Substation 505 and Building 023.
- Disposed of 1127 tons of hazardous waste in FY 1991.

Waste Minimization Planning

- Identified waste streams, conducted audits, and completed interviews.
- Issued a Hazardous Waste Minimization Policy.
- Developed a data base of sitewide hazardous waste inventory categories and sources.
- Completed a Waste Minimization Plan and Performance Report for California's Hazardous Waste Source Reduction and Management Review Act (SB-14).

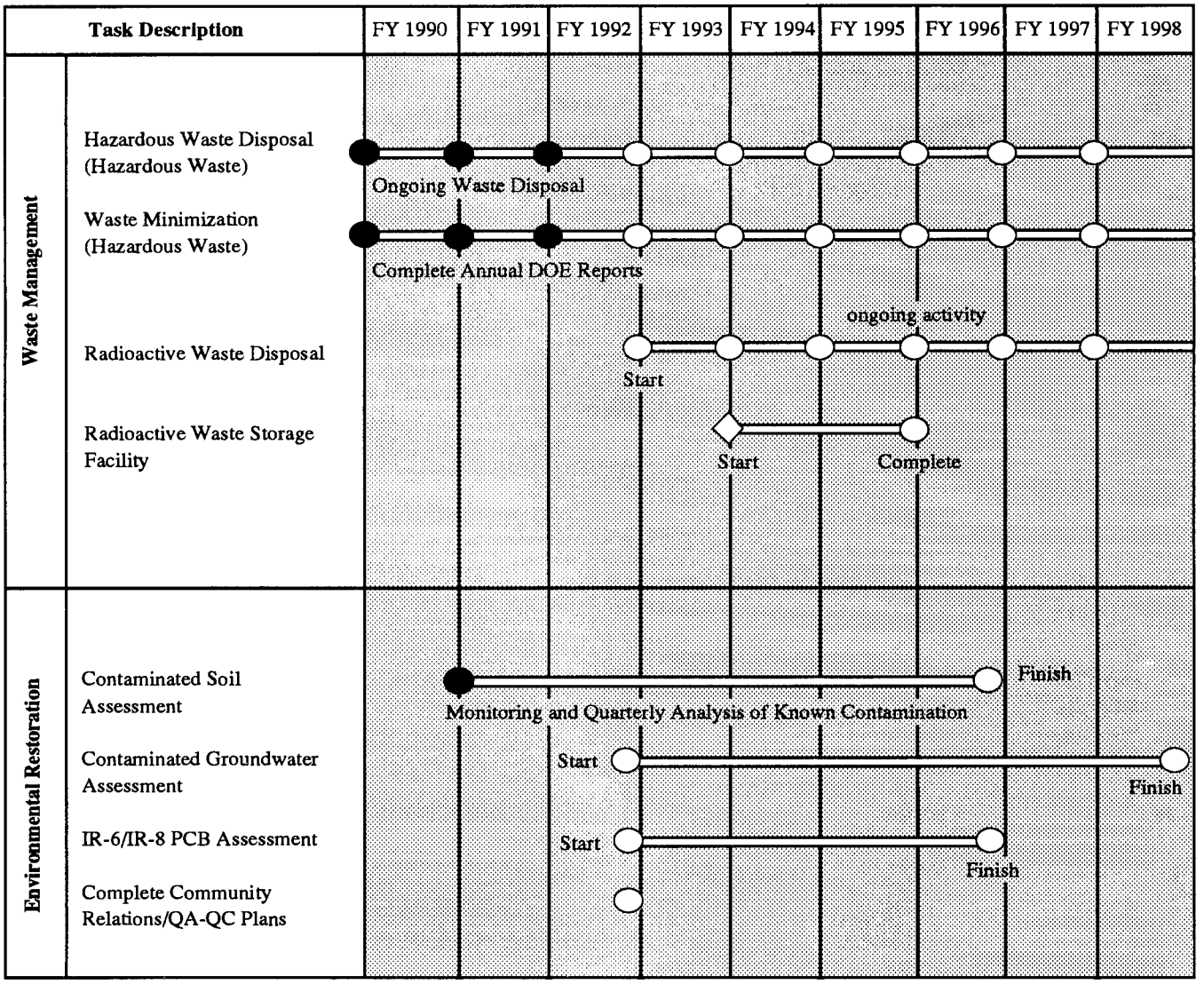
Environmental Restoration

- Prepared Draft Remedial Investigation Work Plan for PCB-contaminated soil.

SAN FRANCISCO FIELD OFFICE
PROGRESS CHART
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 manimization plan.
Remediate PCB-contaminated soil.
Dispose of hazardous waste according to State and Federal laws.



Milestone Types	Milestone Status
○ Unchanged from FY 1993–1997 FYP	○ ◇ □ Planned
◇ New since FY 1993–1997 FYP	● ◆ ■ Complete
□ Changed from FY 1993–1997 FYP	50 percent complete
	Information flow

Notes and Acronyms

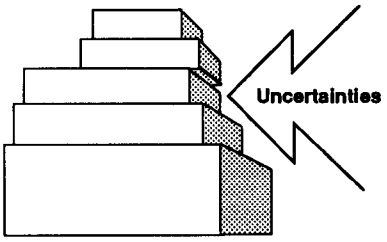
FYP - Five-Year Plan
PCB - polychlorinated biphenyl

MAJOR MILESTONES

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
Waste Management			
• Reestablish shipping authority with Hanford.	New	1Q FY 1993	DOE Order 5820.2A
• Obtain barrel counter for radioactive waste inventory.	New	1Q FY 1994	DOE Order 5820.2A
• Construct a mixed waste and radwaste storage facility.	New	4Q FY 1995	RCRA Part 260-270
• Dispose of 50 cubic yards of activated scrap metal.	New	2Q FY 1993	RCRA Part 260-270
• Submit application for Permit-by-Rule.	New	2Q FY 1993	RCRA Part 260-270
• Dispose of 360 cubic feet of concrete/rebar.	New	1Q FY 1993	DOE Order 5820.2A
Environmental Restoration			
• Complete Community Relations Plan and QA/QC Plans. CERCLA Part 300		New	4Q FY 1992
• Complete assessment of soil contamination.	New	4Q FY 1996	TSCA Sect. 761
• Complete assessment/remediation of IR-6/IR-8 PCB-contaminated soil.	New	4Q FY 1996	TSCA Sect. 761
• Complete assessment of groundwater contamination.	New	4Q FY 1998	RWQCB Order 8588

QA/QC - Quality Assurance/Quality Control
TSCA - Toxic Substance Control Act
RWQCB - Regional Water Quality Control Board

FIVE-YEAR PLAN ESTIMATES



There are a number of potential activities at the Stanford Linear Accelerator Center (SLAC) that may affect program requirements. These potential activities have not been included in the estimates below due to various uncertainties regarding scope of work, the phasing of regulatory reviews and approval schedules, availability of technology, lack of independent cost reviews and other factors. Uncertainties at SLAC are in part due to additional activities required to treat soil and groundwater. If further analysis of these uncertainties and potential additional work results in additional funding needs based on legal requirements, DOE will, through mechanisms such as reallocating budgetary resources, requesting funds through the normal appropriation process, supplemental requests or internal reprogramming, pursue funding for these activities, or where appropriate, based on technical reasons, enter into the formal conflict resolution process with regulatory bodies.

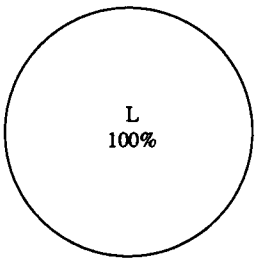
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Corrective Activities/Waste Management	998	2,532	4,465	2,532	2,532	2,532	2,532
Environmental Restoration	580	94	1,225	2,000	1,521	1,714	2,783
Total	1,578	2,626	5,690	4,532	4,053	4,246	5,315

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites.

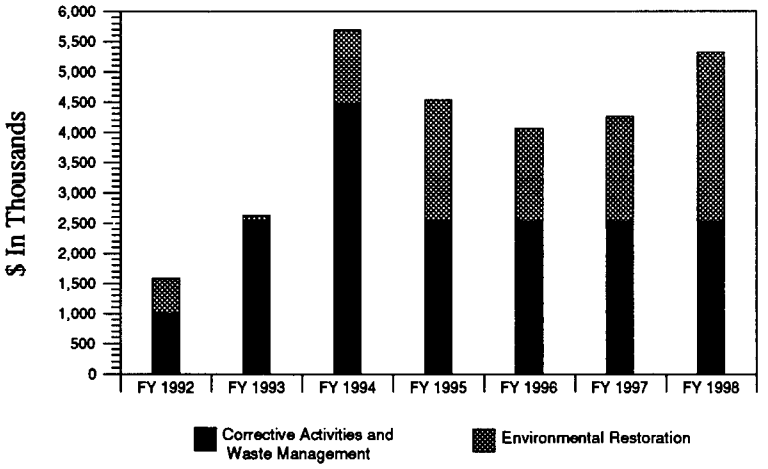
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



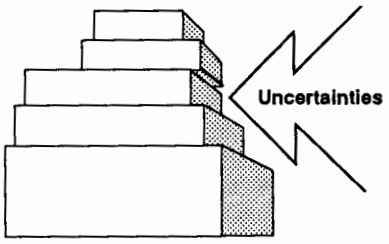
L- Legally Driven Requirements

Estimates by Year



For further information regarding Stanford Linear Accelerator Center, call (510) 273-6398.

FIVE-YEAR PLAN ESTIMATES



There are a number of potential activities at the Savannah River Site (SRS) that may affect program requirements. These potential activities have not been included in the estimates below due to various uncertainties regarding scope of work, the phasing of regulatory reviews and approval schedules, availability of technology, lack of independent cost reviews and other factors. Uncertainties at SRS are considerable and related to full operation of the Defense Waste Processing Facility and the acceptance of new technologies for ground water remediation activities. Selection of remediation alternatives at waste sites and, timely regulatory reviews and approvals are additional uncertainties at SRS. If further analysis of these uncertainties and potential additional work results in additional funding needs based on legal requirements, DOE will, through mechanisms such as reallocating budgetary resources, requesting funds through the normal appropriation process, supplemental requests or internal reprogramming, pursue funding for these activities, or where appropriate, based on technical reasons, enter into the formal conflict resolution process with regulatory bodies.

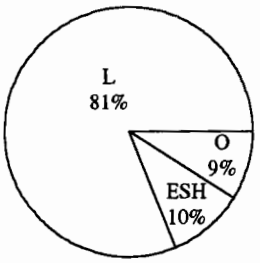
Estimates by Program*
($ In Thousands)

	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998
Corrective Activities/Waste Management	473,965	596,832	635,153	686,101	752,385	825,297	843,009
Environmental Restoration	49,734	65,792	72,419	79,638	87,621	96,358	105,947
Facility Transition	0	2,000	2,000	2,000	2,200	2,400	2,450
Total	523,699	664,624	709,572	767,739	842,206	924,055	951,406

* FY 1992 and FY 1993 EM totals represent actual appropriations. For FY 1994–1998, the Five-Year Plan assumes a growth of five to ten percent per year for the nationwide EM program. These EM program totals were then distributed to the sites.

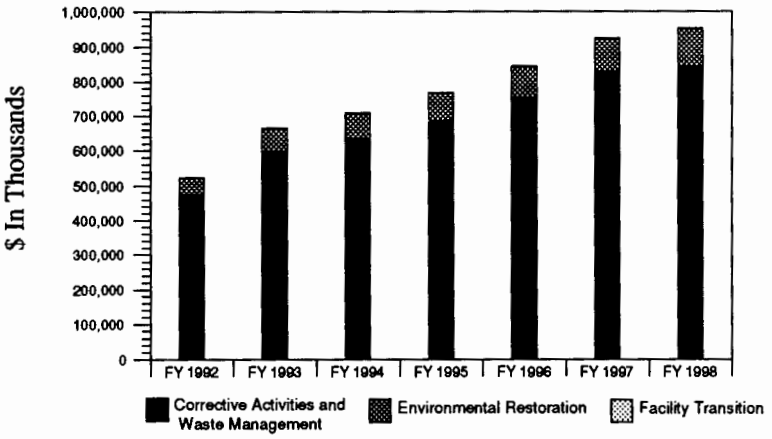
Technology development and transportation management estimates appear in Section 1.5 of Volume I.

FY 1994 Estimates by Driver



L- Legally Driven Requirements
ESH- Environment, Safety, and Health Requirements
O- Other Desirable Activities

Estimates by Year



For further information regarding Savannah River, call (803) 725-3267.

Major Milestones (Continued)

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
• Start F&H-Area Process Sewer Line closure inside fence.	New	1Q FY 1996	RCRA 40 CFR 264.112 FFA Sect. XI, XXII. C.I
• Complete SED I & II.	New	2Q FY 1996	DOE 5820.2A
• Complete Sanitary Landfill closure.	New	1Q FY 1997	RCRA 40 CFR 264.112
• Complete closure of Old Radioactive Waste Burial Ground.	New	2Q FY 1997	RCRA 40 CFR 264.112 FFA Sect. XI, XXII. C.I

[1]Awaiting approval of FFA or Tank Farm Wastewater Permit.
[2]Delay attributed to incomplete training.
[3]Awaiting Waste Certification Review.
[4]Delay is attributed to problems experienced with "first of a kind."
[5]Slippage because of siting problems.
[6]Project on hold awaiting results of alternative studies to meet legal requirements.

CFR - *Code of Federal Regulations*
FFA - Federal Facilities Agreement
NEPA - National Environmental Policy Act
SCPCA - South Carolina Pollution Control Act

Major Milestones (Continued)

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
• Complete closure of H&P-Area Acid/Caustic Basins.	New	4Q FY 1992	40 CFR 264.112 FFA Sect. XI, XXII. C.I
• Develop and submit 39 Rev. 0 Work Plans to EPA.	New	4Q FY 1992	40 CFR 264.112 FFA Sect. XI, XXII. C.I
• Complete closure of New TNX Seepage Basins.	New	2Q FY 1994	RCRA 40 CFR 264.112 CERCLA Sect. 120
• Start L-Area Oil/Chemical Basin closure.	New	2Q FY 1994	RCRA 40 CFR 264.112 CERCLA Sect. 120 FFA Sect. XI, XXII. C.I
• Start Coal Pile (A, C, D, F, H, K, P) closure.	New	4Q FY 1996	RCRA 40 CFR 264.112 CERCLA Sect. 120 FFA Sect. XI, XXII. C.I
• Complete closure of SRTC Seepage Basins.	New	3Q FY 1995	RCRA 40 CFR 264.112 FFA Sect. XI, XXII. C.I
• Start closure of Old Radioactive Waste Burial Ground.	New	3Q FY 1994	RCRA 40 CFR 264.112 CERCLA Sect. 120 FFA Sect. XI, XXII. C.I
• Start sanitary landfill closure.	New	3Q FY 1994	RCRA 40 CFR 264.112
• Start 488-D Ash Basin closure.	New	2Q FY 1995	RCRA 40 CFR 264.112 CERCLA Sect. 120 FFA Sect. XI, XXII. C.I
• Start R-Reactor Seepage Basin closure.	New	2Q FY 1995	RCRA 40 CFR 264.112 CERCLA Sect. 120 FFA Sect. XI, XXII. C.I
• Start Bingham Pump Outage Pits closure.	New	2Q FY 1995	CERCLA Sect. 112 FFA Sect. XI, XXII. C.I
• Start 643-7G Radioactive Waste Burial Ground closure.	New	2Q FY 1998	RCRA 40 CFR 264.112 CERCLA Sect. 120 FFA Sect. XI, XXII. C.I

MAJOR MILESTONES

	Schedule FY 1993–1997 Five-Year Plan	Schedule FY 1994–1998 Five-Year Plan	Regulatory Driver
Waste Management			
• Restart 1H Evaporator.	3Q FY 1992	4Q FY 1992[1]	FFCA Sect. V.16
• Recover 1,250,000 gallons of space by evaporation.	New	4Q FY 1992	FFCA Sect. V.16
• Restart Extended Sludge Processing Facility.	New	3Q FY 1993[2]	RCRA 3304(c)
• Start up E-Area Vaults Expansion Facility.	3Q FY 1992	1Q FY 1993[3]	SCPCA 48-1-30
• Start up DWPF cold chemical runs.	New	1Q FY 1993	FFCA Sect. V.15
• Start up In-Tank Precipitation Facility.	1Q FY 1992	3Q FY 1993[2]	FFCA Sect. V.16
• Start up DWPF waste qualification runs.	New	4Q FY 1993	FFCA Sect. V.15
• Start up New Waste Transfer Facility.	New	1Q FY 1994	FFCA Sect. V.16
• Start up Defense Waste Processing Facility.	1Q FY 1993	3Q FY 1994[4]	FFCA Sect. V.15
• Start up TRU waste facility retrieval operations.	New	4Q FY 1994	FFCA Sect. V.29
• Complete Diversion Box/Pump Pit containment buildings.	New	4Q FY 1994	DOE Order 5480.1B
• Start up Consolidated Incinerator Facility.	1Q FY 1995	1Q FY 1995	FFCA Sect. V.16
• Complete new sanitary landfill.	2Q FY 1995	2Q FY 1996[5]	SCPCA 48-1-30
• Start up replacement High-Level Waste Evaporator.	2Q FY 1995	2Q FY 1997[6]	FFCA Sect. V.15
• Complete Hazardous Waste/Mixed Waste Disposal vaults.	New	1Q FY 1997	FFCA Sect. V.24, 25
• Start up hazardous LL Waste Processing Tanks.	New	1Q FY 1998	RCRA 40 CFR 265.16, 265.31,265.192 265.193
Environmental Restoration			
• Complete closure of Met Laboratory basin.	4Q FY 1992	4Q FY 1992	40 CFR 264.112 FFA Sect. XI, XXII C.I

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.

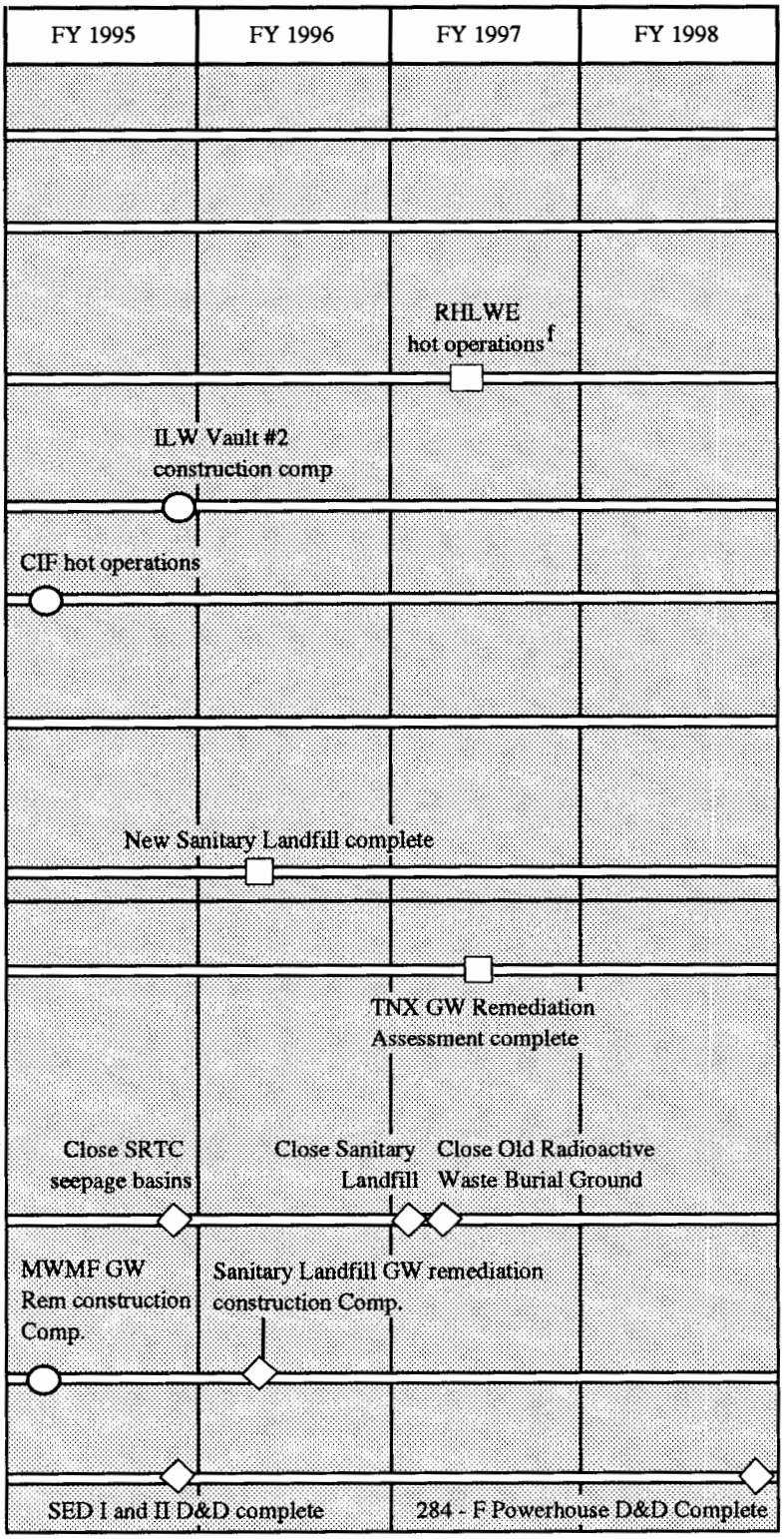
Remediate all sites by FY 2019.

Five-Year Objectives

Begin glassification of HLW.

Construct low-level, hazardous, and mixed disposal vaults and incinerator.

Complete all environmental restoration work plans.



Milestone Types

- ○ Unchanged from FY 1993–1997 FYP
- ◇ New since FY 1993–1997 FYP
- □ Changed from FY 1993–1997 FYP

Milestone Status

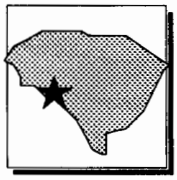
- ○◇□ Planned
- ●◆■ Complete
- 50 percent complete
- Information flow

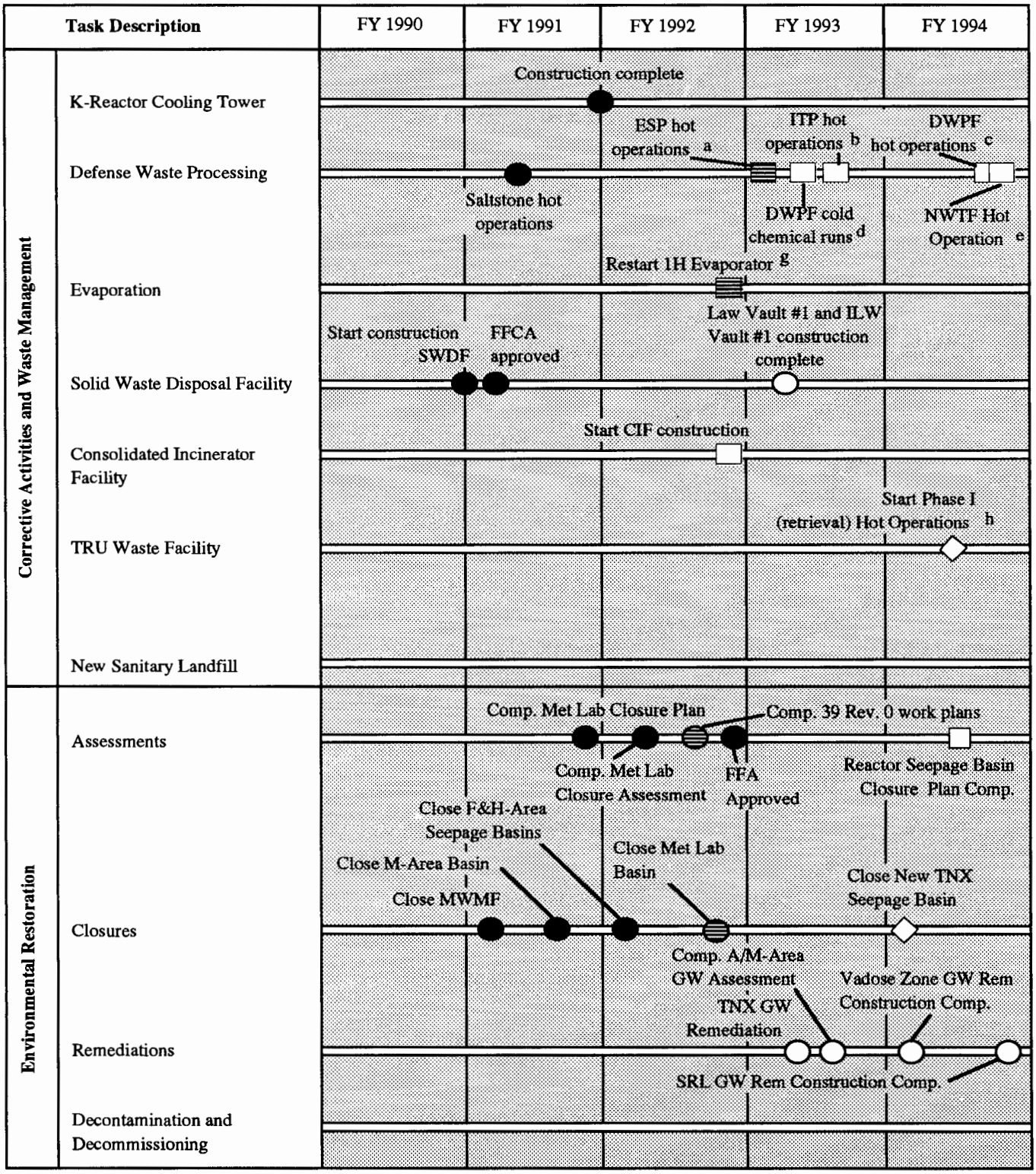
Notes and Acronyms

[a] ESP Startup-delayed due to higher priority ITP startup
[b] ITP Operational-delays due to emergent work
[c] DWPF Hot Operations-schedule delays due to emergent work
[d] Commence DWPF chem runs-delays due to emergent work
[e] NWTF Operational schedule and funding delays
[f] RHLWE operational-delayed by reprioritization
[g] 1H Evaporator startup-waiting on Waste Water Permit approval
[h] TRU Waste Facility-project rebaselined into phased approach

A/M -A and M Areas
CIF -Consolidated Incinerator Facility
Comp -Complete
D&D -decontamination and decommissioning
DWPF -Defense Waste Processing Facility
ESP -Extended Sludge Processing
FYP -Five-Year Plan
FFA -Federal Facilities Agreement
FFCA -Federal Facility Compliance Agreement
F&H -F and H Areas
GW -groundwater
HLW -high-level waste
ILW -Intermediate Level Waste
ITP -In-Tank Precipitation
NWTF -New Waste Transfer Facility
MWMF -Mixed Waste Management Facility
Rem -Remediation
RHLWE -Replacement High-Level Waste Evaporator
SED - Separations Equipment Demonstration
SRTC -Savannah River Technology Center
SWDF -Solid Waste Disposal Facility
TRU -Transuranic
TNX -Training Area

SAVANNAH RIVER FIELD OFFICE
PROGRESS CHART
SAVANNAH RIVER PLANT





ACCOMPLISHMENTS (Continued)

- Enclosures were erected over TRU pads 14–16. A total of 10,336 TRU drums were X-rayed; 42.5% showed water intrusion. The dry drums were placed in the enclosures.
- Contracts were established, and more than 1000 hazardous waste drums were sent off-site for disposal.

Environmental Restoration

- Closure of the F&H-Area Seepage Basins, the M-Area Settling Basin, the Reactor Underground Storage Tank, and the Mixed Waste Management Facility are complete.
- Treatment of the A&M-Area groundwater continued, surpassing a milestone for treating over one billion gallons.
- All scheduled regulatory documents were produced on or ahead of schedule, including 39 Work Plans and seven Closure Plans.
- The Site D&D Facility Assessment Document was completed.

STRATEGIC OUTLOOK (Continued)

Solid radioactive waste will be disposed of in planned state-of-the-art facilities. Concrete vaults will be used to dispose of low-level radioactive, intermediate level radioactive, hazardous and mixed waste forms. Liquid hazardous waste will continue to be shipped off-site for disposal until the Consolidated Incinerator Facility is started up in 1994. This facility will burn hazardous low-level radioactive and mixed wastes, including the benzene stream from the DWPF. The transuranic (TRU) waste facility project was split into two phases with separate facilities for retrieval/repackaging and processing of high-level and low-level TRU waste. The first phase will start up in 1994 and the second phase in 1999.

EM activities are currently managed in accordance with applicable laws and regulations and the approved Federal Facility Compliance Agreement for RCRA Land Disposal Restricted Waste. A Federal Facilities Agreement is expected to be approved in 1992 to cover those activities where RCRA and CERCLA overlap. The Federal Facilities Agreement will affect Tank Farm and Environmental Restoration activities. There is also a pending Settlement Agreement with the South Carolina Department of Health and Environmental Control, expected to be approved in 1992, concerning solvent rags contained in buried radioactive waste containers. Another agreement, concerning disposition of findings from a 1990 EPA audit of Waste Management activities, was approved in 1992.

Several programs are in progress to vastly improve the operation of existing and planned liquid and solid waste generating, storage, and processing facilities. A disciplined approach to the execution of all activities is being developed consistent with practices in the commercial nuclear industry. Implementation of programs in the conduct of operations, technical, maintenance and training areas is well under way. The goal of this effort is to ensure that the five- and 30-year plans are implemented in a manner that will increase public confidence in our ability to accomplish the stated mission.

ACCOMPLISHMENTS (FY 1991 – 3Q FY 1992)

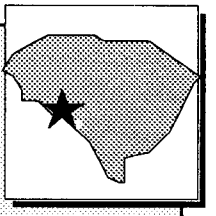
Corrective Activities

- Construction of the K-Reactor Cooling Tower is nearing completion.

Waste Management

- Construction of the ITP Facility was advanced to 98% complete. Startup testing (water runs) of all systems was completed. Construction and checkout of the fire suppression system and expansion of the ITP control room was completed. A team was formed to execute restart of the Extended Sludge Processing Facility. Construction activities were initiated. Funding was obtained to resume construction, checkout and run-in activities at the New Waste Transfer Facility.
- All except one of 18 prestartup requirements for the 1H evaporator were resolved. The 1H evaporator will restart pending DOE Headquarters notification and resolution of the final startup requirement.
- Construction of waste removal facilities was completed on one waste tank (41H) and initiated on several other tanks.
- The majority of the rainwater drainage system modifications for the Solid Waste Disposal Facility are complete. Engineered Low-Level Trench 4 operations are back to normal. Construction of the E-Area Vaults and Long-Lived Waste Building was initiated, and a Startup Team was formed.
- Construction of the replacement High-Level Waste Evaporator is 23% complete.

SAVANNAH RIVER FIELD OFFICE
INSTALLATION SUMMARY
SAVANNAH RIVER SITE



DESCRIPTION

The Savannah River Site (SRS) produces nuclear materials, primarily tritium and plutonium, for national defense. The SRS is located in south-central South Carolina and is bordered on the southwestern side by the Savannah River. The closest major population centers 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 facilities. The total area of the site is approximately 325 square miles. The production facilities occupy less than five percent of the site area.

STRATEGIC OUTLOOK

The SRS EM mission is (1) to manage activities to achieve full compliance with all applicable laws, regulations, and agreements; (2) to integrate the above into all operating DOE facilities; (3) to treat, store and dispose of the current inventory of waste; (4) to reduce the generation of new wastes; (5) to clean up inactive waste sites; (6) to remediate contaminated groundwater; and (7) to decontaminate and decommission surplus facilities. This will be accomplished over a 30-year period with specific near-term activities outlined in this Five-Year Plan.

Seventeen major milestones are outlined in the FY 1994–1998 Five-Year Plan to correct adverse environmental conditions and to remediate and close abandoned waste sites. Planned environmental restoration activities within the Five-Year Plan include closing seven sites (two are currently in progress), starting eight groundwater remediation programs (one currently in progress), and completing 63 waste site investigations (60 currently in progress). All currently identified environmental restoration activities will be completed by 2003.

Decontamination and decommissioning (D&D) activities other than surveillance and maintenance will be started at nine facilities with one completed during the five-year planning period (the Savannah River Technology Center Separations Equipment Development 1 facility). This facility will be completely decontaminated and decommissioned. A total of 657 D&D candidate sites have been identified. D&D of all facilities will be complete by 2019. Determination of the types, volumes, and final disposition of waste generated from all D&D activities as well as the future land-use is in progress.

Waste Management is aggressively changing its role from waste storage and evaporation to waste processing necessary for stabilization and final disposition of liquid radioactive waste. Facilities to remove liquid and solid waste from all six old-type waste tanks and six new-style waste tanks will be completed in the five-year planning period. All two-year-old waste tanks will be emptied and undergo D&D operations by 2019. The waste removed from the waste tanks will be processed in the Tank Farm at the In-Tank Precipitation (ITP) and Extended Sludge Processing (ESP) facilities and fed to the Defense Waste Processing Facility (DWPF) for final on-site treatment and storage. ITP and ESP are scheduled to start up in 1992. DWPF is scheduled to start up in 1994. The Replacement High-Level Waste Evaporator is scheduled to start up in 1996 to handle the DWPF recycle and ESP washwater streams.