

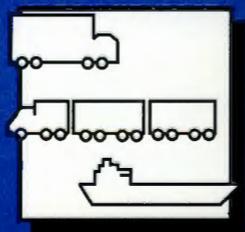


United States Department of Energy
Environmental Restoration and
Waste Management

*Five-Year Plan
Fiscal Years 1992-1996*

June 1990

EXECUTIVE SUMMARY



This report has been reproduced directly from the best available copy.

Available from the National Technical Information Service, U.S. Department of Commerce,
Springfield, Virginia 22161.

Price: Printed Copy A05
Microfiche A01

Codes are used for pricing all publications. The code is determined by the number of pages in the publication. Information pertaining to the pricing codes can be found in the current issues of the following publications, which are generally available in most libraries: *Energy Research Abstracts*, (ERA); *Government Reports Announcements and Index* (GRA and I); *Scientific and Technical Abstract Reports* (STAR); and publication, NTIS-PR-360 available from (NTIS) at the above address.

0009913

DOE/S-0077P

Environmental Restoration and Waste Management

*Five-Year Plan
Fiscal Years 1992- 1996*

EXECUTIVE SUMMARY



June 1990



United States Department of Energy

Washington, DC 20585

000000

**THIS PAGE INTENTIONALLY
LEFT BLANK**



100
100
100
100
100
100
100
100
100
100



The Secretary of Energy
Washington, DC 20585

June 1990

I am pleased to submit to Congress and the Nation the Department of Energy's Environmental Restoration and Waste Management Five-Year Plan for Fiscal Years (FY) 1992-1996. In March 1989, I promised to develop a plan for cleaning up DOE's nuclear-related waste sites and to bring its aging facilities into compliance with today's environmental laws and regulations. That plan was completed and made available for public comment in August 1989, after two earlier reviews by representatives of significantly affected States and Indian Nations, the National Governors' Association, the National Association of Attorneys General, the National Conference of State Legislatures, the Environmental Protection Agency (EPA), other executive agencies, and the National Academy of Sciences. A major commitment made by that plan was to initiate an aggressive technology development program to provide DOE with solutions to problems not now having solutions and to devise better solutions to the Department's other problems. A draft Research, Development, Demonstration, Testing, and Evaluation (RDDT&E) Plan was completed in November 1989. Both plans have been incorporated and made current in this FY 1992-1996 Plan, which also reports on progress achieved since last year.

I also can report that the departmental reorganization to integrate responsibility for facility cleanup and compliance has been completed. A new Office of Environmental Restoration and Waste Management has been established. This reorganization will raise the visibility of DOE's environmental problems and will increase accountability for finding and implementing solutions. I reaffirm my full intention, as stated in testimony before the Congress, to raise this Office to the status of Assistant Secretary.

Accountability has also been increased by revising the relationship between DOE and its management and operating contractors, and specific guidelines have been established that may determine a contractor's entire award fee based on the exercise of proper environmental stewardship.

I believe the Department has made an excellent start, but it is just a start. Both within and outside the agency, DOE must work to help achieve the national consensus and the technological and political breakthroughs required to accomplish the goal of cleanup and compliance by the year 2019.

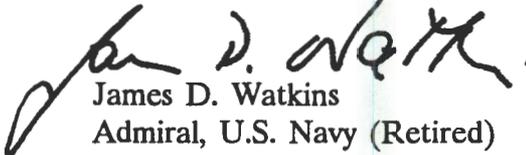
The problem is large and complex. It requires technical competence, new innovative technologies, management discipline, and a national technical infrastructure that currently does not exist to assure that the financial resources are expended in the most effective manner.

The Department must work toward a spirit of a cooperative, success oriented program with the States and Congress. I recognize that without proper planning, the expenditures of large resources could result in waste and inefficiency.

As recently as October 1989, the Administrator of the EPA has stated that the Nation does not have enough qualified engineers to take on the Superfund cleanup simultaneously at all sites. The Department's Environmental Restoration and Waste Management program only compounds an already difficult problem. Even if more funds were applied to the total program, there is not sufficient capability within the Department, its contractors, or the Nation to use these funds effectively. As I indicated in the FY 1991-1995 Plan, the Department will not have a plan that coincides with outyear budget requirements until FY 1992. That situation still prevails.

Finally, I want to thank the Department's employees, both at Headquarters and in the field, for working so hard to implement my vision for the agency. I also want to thank all the reviewers of the Five-Year Plan and the draft RDDT&E Plan. These documents, and DOE's thinking as well, benefited greatly from their comments.

Sincerely,



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

U.S. DEPARTMENT OF ENERGY
SECRETARY

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

DIRECTOR, OFFICE OF ENVIRONMENTAL RESTORATION
AND WASTE MANAGEMENT

Leo P. Duffy

DEPUTY DIRECTOR, OFFICE OF ENVIRONMENTAL RESTORATION
AND WASTE MANAGEMENT

Paul D. Grimm

DIRECTOR, ENVIRONMENTAL RESTORATION AND
WASTE MANAGEMENT FIVE-YEAR PLAN

R. Pat Whitfield

DEPUTY DIRECTOR

Gale P. Turi

EDITOR-IN-CHIEF

Louis I. Middleman

EDITORIAL & POLICY
COORDINATION

Gale Turi

Alice Clayton

Jane Kraemer

Jim McBrayer

Louis I. Middleman

ENVIRONMENTAL
RESTORATION

John Lehr

Dale Black

Donna Frost

James Frost

Cindy Johnson

James Otten

Richard Shanklin

Craig Toussaint

Andrew Walker

TECHNOLOGY
DEVELOPMENT

Susan Prestwich

Steve Bork

Carl Cooley

Norman Cutshall

Sash Eirich

Chet Francis

Richard Gillans

Joan Keller

Gus Kosinski

Phil McGinnis

Jan Pruett

William Scott

Steve Slate

Mark Triplett

Michael Vannoni

Larry Vogel

CORRECTIVE ACTIVITIES
& WASTE OPERATIONS

Steve Ketola

Paul Dickman

Ben Gannon

James Hammelman

Mary Harmon

Tim Kirkpatrick

Alex Murray

Mark Shepard

Bob Vallario

Dotti Whitt

Rob Woolley

TRANSPORTATION

Susan Denny

Dennis McCall

Janet Michel

Joanne Passaglia

Charles Sell

Richard Yoshimura

CONTRACTOR
SUPPORT

Bennie DiBona

Brenda Allen

Karen Behpou

Alonzo Bibines II

Jean Brooks

Carlos Carbo

Morgan Curry

Doris Donnella

Alice Dove

Sherie Hedstrom

Cindy Jordan

Brian Keltch

John Lewis

Marian Muir

Hong Nguyen

Melissa Oehl

Wendy Osborne

Yvonne Quinney

Jeff Rausch

Helen Reyes

Marilyn Schuette

Bobbie Smith

Marilyn Tolbert-Smith

Tammy Veith

Mimi Wahlmann

Roxanna Weddle

Bruce Whitt

THIS PAGE INTENTIONALLY
LEFT BLANK

CONTENTS

	Page
FOREWORD	iii
1.0 EXECUTIVE SUMMARY	
1.0 <u>Purpose/Scope/Overview</u>	
1.1 Purpose and Scope of This Document	2
1.2 Growth in Environmental Restoration and Waste Management Cost Estimates	4
1.2.1 Funding Intelligently in the Face of Major Uncertainties and Limited Resources and Infrastructure	10
1.3 Goals and Commitments	16
1.4 Prioritization and Funding of Program Activities	18
1.4.1 Progress in Developing a Consensus-Based Prioritization Methodology	26
1.5 Long-Term Perspective: DOE's Strategy for Achieving its 30-Year Compliance and Cleanup Goal	28
1.5.1 Role of Technology Development in Compliance and Cleanup	30
1.6 New DOE Organization for Environmental Restoration and Waste Management	32
1.6.1 Increased Independent Accountability Through the Office of Quality Assurance and Quality Control	34
1.7 Integrating Environmental Restoration and Waste Operations with Technology Development	36
1.8 Relation of Five-Year Plan to the Federal Budget Process and Site-Specific Planning Process	40
1.9 Need for Flexibility to Ensure Successful Plan Implementation	44
1.10 Preparation and Review of Site-Specific Plans	46

1.11	DOE Process for Future Five-Year Planning	48
<u>Status/Changes</u>		
1.12	Summary Status of Commitments Made in Last Year's Plans	50
1.13	Summary of Changes from the FY 1991-1995 Five-Year Plan	52
<u>Culture</u>		
1.14	Changes in DOE's Culture: Tougher on the Inside	54
1.15	Changes in DOE's Culture: Softer on the Outside	56
1.15.1	Emphasis on Public Participation Plans and Activities	60
1.16	Waste Minimization's Multifaceted Role in Compliance	62

FOREWORD

The Department of Energy (DOE) continues to view as one of its most challenging problems the minimization, management, and cleanup of waste materials generated from Departmental operations. With the publication of this Environmental Restoration and Waste Management Five-Year Plan for FY 1992-1996, DOE reaffirms its policy that full compliance with the letter and spirit of environmental laws, regulations, and requirements is an integral part of operating DOE facilities. The fundamental goal is to ensure that risks to human health and safety and to the environment posed by the Department's past, present, and future operations are either eliminated or reduced to prescribed, safe levels by the year 2019.

Responding to Growth in Cost Estimates for Plan Activities

Overall cost estimates set forth in this Plan are higher than those shown in the FY 1991-1995 Five-Year Plan published in August 1989. These higher amounts are due to (1) increases in estimates for carrying out activities set forth in last year's Plan, (2) additional activities within the overall scope of last year's Plan, and (3) new activities that were not included last year. It is believed that only a portion of such increases is validated and can be responsibly accommodated. A certain amount of work associated with these increased estimates exceeds the current and immediately foreseeable capability of the Nation's technical, industrial, management, and regulatory infrastructure to absorb, manage, or otherwise carry out. In addition, the costs shown in this Plan imply an ability to maintain schedules that were established in the previous Five-Year Plan. If Congress appropriates an amount less than the new cost estimate for FY 1991, schedules will need to be revised. Note also that the revised cost estimates for FY 1991 and the outyears exceed the targets currently planned by the Administration and requested by the Department. The actual amounts to be requested for FY 1992 will depend on budget decisions yet to be made. The final decisions on the FY 1992 budget may also result in a need to adjust schedules in the outyears.

Through this document, DOE is informing the Congress, the Environmental Protection Agency (EPA), the States, and other parties of the estimates of costs submitted by the Department's field offices; the Department is working with these and other affected parties to plan and conduct cost-effective programs. However, DOE cannot forsake a responsible approach by undertaking activities that lie beyond its capability to carry out. An unrestrainedly aggressive effort, without the infrastructure to support such effort, is irresponsible and may actually result in reduced protection of public health and safety and the environment. Growth must be responsibly managed. As a consequence, the Department is working diligently through its budget process to identify and validate the limits of management and technical infrastructure.

Plan Scope

This Plan updates the FY 1991-1995 Five-Year Plan, incorporates (in Section 5) a condensed version of the Draft Applied Research, Development, Demonstration, Testing, and Evaluation (RDDT&E) Plan, and adds Section 6, Transportation. It begins with FY 1990 budget execution and continues through FY 1991 budget request, FY 1992 budget

formulation, and outyear cost estimates through FY 1996. The Plan reflects a new Headquarters organization, the Office of Environmental Restoration and Waste Management (EM). This organization, established in November 1989, fulfills a major Departmental commitment to create a high-level focal point for the consolidated environmental management of nuclear-related facilities and sites formerly under the separate cognizance of the Assistant Secretaries for Defense Programs and Nuclear Energy and the Director of the Office of Energy Research. Superfund sites at which DOE is considered to be a potentially responsible party continue to be included in the Plan as they are identified.

The Plan includes activities managed under three Associate Directors (ADs): Environmental Restoration, Waste Operations, and Technology Development. The AD for Environmental Restoration is responsible for the assessment and cleanup of inactive sites and the decontamination and decommissioning of surplus facilities. The AD for Waste Operations is responsible for Corrective Activities (activities necessary to bring active and standby facilities into compliance with applicable local, State, and Federal regulations); for minimization, treatment, storage, and disposal of wastes generated as result of ongoing operations at active facilities; for landlord functions at several DOE installations; and for projects related to the modernization of facilities under the cognizance of EM. The AD for Technology Development is responsible for managing and implementing the aggressive program described in the November 1989 Draft RDDT&E Plan. The AD for Technology Development is also responsible for environmental education programs and for the Department's Transportation Program. Although including DOE's annual contribution to the Nuclear Waste Fund, the Plan does not include activities and costs related to the permanent isolation of spent fuel and other high-level waste managed by the Office of Civilian Radioactive Waste Management.

Section 1 is an Executive Summary, including an overview of the status of commitments made in the two 1989 Plans, changes envisioned since those Plans, and new commitments for the future, including expanded public involvement in the planning process. Details on the status of commitments may be found in Appendix B.

Sections 2-4 provide information on planned activities in the three compliance-related areas of Corrective Activities, Environmental Restoration, and Waste Operations (including projects to modernize certain facilities), with specific information by Operations Office and installation collected in Attachments A-C.

Section 5, Technology Development, constitutes a condensed version of the Draft RDDT&E Plan. This section describes the organization, management, initial emphases, and process for implementing this new program, including the means for shaping its activities to solve DOE's compliance, cleanup, and waste operations problems more safely, faster, and at lower cost than would be possible with the Department's current technology. The Technology Development Program, including education and outreach programs to meet projected needs for scientists, engineers, and technicians, will both focus DOE resources and consolidate cooperation with other governmental agencies, industry, universities, and the international waste management community. Technology Development will address RDDT&E needs during FY 1990 and will provide more specific plans for the Five-Year Plan for FY 1993-1997 in May 1991.

Section 6, Transportation, is included to respond to internal and external requests to expand the treatment of this area of DOE activities beyond the two modules in the first Five-Year Plan. The Plan now includes a more detailed look at transportation operations, packaging research and development, shipment mode and routing, emergency response training, and public (especially State, Tribal, and local) awareness and involvement.

Expanded Public Participation in Plan Formulation and Review

DOE has taken steps to increase public involvement in the Plan's formulation and review.¹ In April 1990, DOE convened a Stakeholder Forum to broaden the range of public involvement.² The Forum provided helpful information and insight regarding DOE's environmental program and the Five-Year Plan. DOE intends to provide similar opportunities for public involvement at the State and local levels. Through openness and cooperation, DOE hopes to make its environmental program more responsive to public concerns and better able to meet its primary objectives of protecting public health and safety and the environment.

Process for Comment Disposition and Response to Comments on FY 1991-1995 Five-Year Plan and November 1989 Draft RDDT&E Plan

The Department is committed to meaningful public participation in its Environmental Restoration, Waste Operations, and associated Technology Development activities. Therefore, DOE has implemented a comprehensive process for recording, incorporating, and responding to comments on the Five-Year and RDDT&E Plans. Federal Register notices and press releases for the Five-Year and RDDT&E Plans were published announcing the availability of the Plans and requesting public comments. The comment periods closed on December 1, 1989, and January 1, 1990, respectively. Thirty comment letters on the Five-Year Plan and 13 on the RDDT&E Plan were received. Copies of the comment letters are available in the DOE Reading Room at the James R. Forrestal Building, 1000 Independence Avenue, S.W., Washington, D.C. 20585.

¹ Six States (California, Florida, Illinois, Missouri, New York, and Texas) and the Confederated Tribes of the Umatilla Indian Reservation (Oregon), who have treaty rights granting access to the Hanford Reservation for fishing and hunting, have joined the State and Tribal Government Working Group (STGWG) established last year with representatives from Colorado, Kentucky, Idaho, Ohio, Nevada, New Mexico, South Carolina, Tennessee, and Washington; the Yakima and Shoshone-Bannock Nations; the National Association of Attorneys General; the National Conference of State Legislatures; and the National Governors' Association. After reviewing two predecisional drafts, the original STGWG reviewed both the final August 1989 Five-Year Plan and the Draft RDDT&E Plan in October. STGWG has also met with DOE three times (March, May, and June 1990) to review and comment on formulative drafts of this FY 1992-1996 Five-Year Plan. A central STGWG concern is that the Department's five-year planning process (and STGWG's role in that process), its 30-year compliance and cleanup goal, and some means (e.g., a Near-Term Response Fund) of ensuring funding of activities to reach the 30-year goal, be institutionalized. DOE will review any efforts or proposals brought forward by STGWG members (individually or collectively) for consistency with the aims and requirements of the Five-Year Plan. Another working body, the External Review Group (ERG), invited to help DOE develop a rigorous, risk-based, technically and institutionally acceptable methodology to prioritize its environmental restoration activities, began meeting last fall. ERG members include representatives from the States invited to participate in STGWG and representatives from the Environmental Protection Agency (EPA), the Natural Resources Defense Council, and the Environmental Defense Fund. Discussions to date have focused on general scoping and policy issues and on criteria specification. Initial work will concentrate on developing a formal methodology for application to environmental restoration activities. If the approach developed for this major programmatic element proves practical and acceptable, it may be extended and tailored to deal with Waste Operations activities.

² The Forum included more than 40 participants representing DOE, EPA, the Office of Management and Budget, the Office of Technology Assessment, States, Indian Nations, industry, labor, academia, and environmental and public interest organizations. The participants attended as individuals, not as official representatives of specific organizations.

The comments in the letters on the Five-Year Plan were separated into six categories-- Policy, Waste Management, Corrective Activities, Environmental Restoration, Research and Development, and Transportation. To facilitate responding to the comments and to optimize the usefulness of the responses to a general reader, all the comments for a given category were reviewed, and major issues were identified. Each of the major issues is responded to in Appendix C. Appendix C1 contains the National Academy of Sciences' comments (and DOE responses) on the Five-Year Plan. A list of the commentators is also included.

Prioritizing the Plan's Activities

The Plan relies on four categories similar to those used in the FY 1991-1995 Five-Year Plan, reflecting the discrete goals of (1) preventing near-term adverse impacts to workers, the public, or the environment; (2) meeting the terms of agreements in place or in negotiation between DOE and local, State, and Federal agencies; (3) reducing outyear risks and costs, complying with internal DOE Orders, complying with external environmental laws and regulations not addressed under item 2, and preventing the disruption of Departmental missions; and (4) accelerating overall compliance. A rigorous, risk-based prioritization methodology is under development.

The Plan incorporates an important departure from last year's prioritization: Corrective Activities are not subject to competition with other activities; all are now Priority 1. Technology Development activities are being selected according to criteria related to actual and foreseen needs for new ways to solve the Department's environmental problems. These criteria are based on a technology development project's expected benefit and on the likelihood of its success.

Technology Development Integral to Achieving Environmental Goals

Achieving DOE's environmental goals requires conducting program activities designed, both in their processes and in their results, to decrease workers' and the public's exposure to radioactive and hazardous substances and to do the job faster and at lower cost. Technology Development efforts will focus both on long-term benefits to human health and the environment and on health hazards to workers. The EM Director will work to help involve private industry in seeking and implementing solutions to cut lead time, first, between a good idea and the tested realization of that idea, and second, between technology availability and full-scale implementation. The EM Director will also aggressively pursue the testing and evaluation of commercially available technologies applicable to solving the Department's problems.

Compliance and remediation cannot always wait for improved technologies; the provisions of some agreements require DOE to begin certain activities now, using the best means at hand. But when waiting can bring significant benefit, it may be preferable to attempt to negotiate changes in the schedule for implementing required remedies. When no permanent solution exists, the Department's aim will be to confine contamination so that problems do not worsen and to stabilize and significantly reduce the hazard and volume of waste that must be dug up and reburied.

Regulatory/Public Policy Issues Addressed in Parallel with Technology Development

To facilitate implementation of new technologies, DOE will require all Technology Development activities to address as parallel issues regulatory compliance and the need for public involvement in DOE's Technology Development activities. In the past, development focused on science and engineering in a limited forum, excluding public policy concerns and the regulatory process required to gain permits for technology demonstration or full-scale implementation. DOE will involve the public early and clearly define to the regulatory bodies the process of technology selection to increase the likelihood of regulatory acceptability and speed the issuance of permits. DOE will conduct its Technology Development program in an open forum. Conferences, written material, and invitations to observe key demonstrations of new technologies will keep the public abreast of progress.

Waste Minimization

Although historically understood, in part, as waste volume reduction and concentration, true waste minimization must be seen as the avoidance of the generation of radioactive, hazardous, and mixed waste before treatment, storage, or disposal. DOE will make waste minimization a key objective, not only in process and facility modification, but also in the procurement of goods and services. Waste minimization technology is the most interdisciplinary of the waste management tools, affecting all present and proposed DOE operations. Establishing a waste minimization program will require cultural as well as technical changes in the DOE complex. A "design for minimization" philosophy must be adopted across the DOE system. Moreover, through its education program, the Office of Technology Development must encourage educational institutions to instill in up-and-coming engineers, scientists, and technicians a determination to think, plan, and build waste minimization into their professional culture.

The major new modernization goal of minimizing waste generation entails a significant Technology Development component. The Office of Technology Development will manage the development and demonstration of new processes to avoid the generation of waste containing radioactive and hazardous constituents. Equipment used in waste processing will be designed to clean with nonhazardous substances and/or to yield a nonhazardous product.

While waste minimization will significantly reduce the amount of waste that must be managed, waste generation cannot be altogether eliminated. Generated waste must be managed more effectively than it has been in the past, which will require new and better ways to treat, store, and dispose of it. The Technology Development Program, in concert with waste minimization planning efforts at each site mandated by DOE Orders, will seek to develop and demonstrate technologies to provide permanent solutions for generated wastes.

Effects on DOE Planning of Important Internal and External Events Since the Publication of the August and November 1989 Plans

The Secretary's ten-point initiative (June 1989) for compliance and cleanup included direction to the Assistant Secretary for Environment, Safety and Health to deploy environmental assessment "Tiger Teams" like the 25-person team sent to the Rocky Flats Plant in Colorado to investigate regulatory performance and to make recommendations for activities required to address near-term health and safety risks to workers and the public. The Rocky Flats investigation identified the need for additional funding to conduct required activities in FY 1990. Assessments have also been concluded at the Feed Materials Production Center in Ohio, the Mound Plant in Ohio, the Portsmouth Gaseous Diffusion Plant in Ohio, the West Valley Demonstration Project in New York, the Oak Ridge Y-12 Plant in Tennessee, the Pantex Plant in Texas, the Savannah River Site in South Carolina, the Nevada Test Site in Nevada, the Kansas City Plant in Missouri, the Pinellas Plant in Florida, Lawrence Livermore National Laboratory in California, and Brookhaven National Laboratory in New York. Results of these investigations may require expenditures unforeseen during the enactment of the budget for FY 1991 and the formulation of the budget for FY 1992. DOE's need for flexibility to respond to such sudden requirements is the basis for the concept of a Near-Term Response Fund. This concept was mentioned in the FY 1991-1995 Plan and receives more detailed treatment here.

The Department faces major uncertainties in the delay in and potential litigation regarding the conduct of experiments with radioactive waste at the Waste Isolation Pilot Plant (WIPP) in New Mexico. The Secretary's evolving Decision Plan for WIPP recognizes the likelihood of delay and the uncertainty of its duration. Meanwhile, DOE is attempting to determine where and how to store mixed transuranic waste pending WIPP opening and EPA's decisions concerning compliance with RCRA Land Disposal Restrictions for mixed waste.

Independent Internal and External Oversight of the Plan's Activities

Consistent with the new culture of open communication of unclassified information and with accountability for excellence in both DOE and contractor line management, the Department will continue the independent internal oversight of the Assistant Secretary for Environment, Safety and Health and the Advisory Committee on Nuclear Facility Safety (Ahearne Committee) and welcomes the independent external oversight of the congressionally mandated Defense Nuclear Facilities Safety Board.

The Department's ability to bear the scrutiny of these and other bodies and the public rests in the implementation of procedures specified in DOE Order 5700.6B, Quality Assurance. This Order endorses ASME NQA-1 (1989 Edition), Quality Assurance Program Requirements for Nuclear Facilities, and DOE Order 4700.1, Project Management, which describes the importance of Quality Assurance in Major Systems Acquisition and Project Management Systems. DOE Order 5820.2A, Radioactive Waste Management, makes ASME NQA-1 a mandatory standard. Regulatory agencies' quality assurance procedures, including EPA's 16-point program for hazardous wastes and remedial investigations, will also be incorporated where applicable.

1.0

Executive Summary



1.1 PURPOSE AND SCOPE OF THIS DOCUMENT



This document reaffirms the U.S. Department of Energy's (DOE's) commitment to a 30-year goal of compliance with laws, regulations, and agreements aimed at protecting human health and the environment; consolidates DOE's planning for Environmental Restoration, Waste Operations (including Corrective Activities), and Technology Development (including Transportation and Education); reports progress made toward achieving compliance goals; and explains changes in strategy due to new policies and external events.

This document reflects DOE's fulfillment of a major commitment of the Environmental Restoration and Waste Management Five-Year Plan (DOE/S-0070, August 1989): reorganization to create an Office of Environmental Restoration and Waste Management (EM) responsible for the consolidated environmental management of nuclear-related facilities and sites formerly under the Assistant Secretaries for Defense Programs and Nuclear Energy and the Director of the Office of Energy Research. The purposes of this Plan for FY 1992-1996 are (1) to measure progress in meeting DOE's compliance, cleanup, and waste management agenda; (2) to incorporate a revised and condensed version of the Draft Research, Development, Demonstration, Testing, and Evaluation (RDDT&E) Plan (November 1989) to describe DOE's process for developing the new technologies critically needed to solve its environmental problems; (3) to show DOE's current strategy and planned activities through FY 1996, including reasons for changes required to meet compliance and cleanup commitments; and (4) to increase the involvement of other agencies and the public in DOE's planning.

The Plan includes program activities and costs for Corrective Activities, Environmental Restoration (Remedial

Actions and Decontamination and Decommissioning), Waste Operations, and Technology Development (including Transportation and Education). Included in Waste Operations are the costs associated with Purex and with landlord responsibilities at the Idaho National Engineering Laboratory in Idaho; the Hanford Reservation at Richland, Washington; and the Oak Ridge Gaseous Diffusion Plant in Tennessee. Also included are activities related to modernizing facilities under the cognizance of EM. The Plan includes EM's costs resulting from the independent internal oversight function of DOE's Safety and Health Program (Office of the Assistant Secretary for Environment, Safety, and Health). Although the Plan does not include programs of the Office of Civilian Radioactive Waste Management, it does include EM's annual contribution to the Nuclear Waste Fund for disposal of defense high-level waste and research toward characterizing the defense waste form for repository disposal.

There are six sections in this Plan. Section 1 is an executive-level summary of DOE's management, compliance, technical, and culture-related (including public involvement and review) accomplishments; setbacks; new and continuing commitments; and long-term strategy in light of last year's plans and current reality. Sections 2 through 4 and

Attachments A through C describe accomplishments, changes, and planned activities in the areas of Corrective Activities, Environmental Restoration, and Waste Operations, including program overviews, management approaches, and summary and detailed costs and milestones.

Section 5 and Attachment D, Technology Development (including education initiatives and university partnerships), display DOE's process for meeting identified technology needs related to Corrective Activities, Environmental Restoration, and Waste Operations. DOE's goal is to solve and prevent the recurrence of its essential environmental problem: actual or threatened migration to the biosphere of 40 years of radioactive and hazardous chemical pollutants dispersed through large volumes of soil

and groundwater. These pollutants are often difficult to access for treatment and to reduce to regulatory standards. DOE must strive to transcend current methods and tools, replacing them with more effective and efficient means. When needed methods are not currently available, Technology Development must seek to provide them, either through adaptation from other fields or through development in concert with industry and academic institutions.

Section 6 and Attachment D, Transportation, have been added in response to many internal and external requests for a more comprehensive treatment of DOE's accomplishments and plans in this operational and research and development area than was provided in the Five-Year Plan for FY 1991-1995.

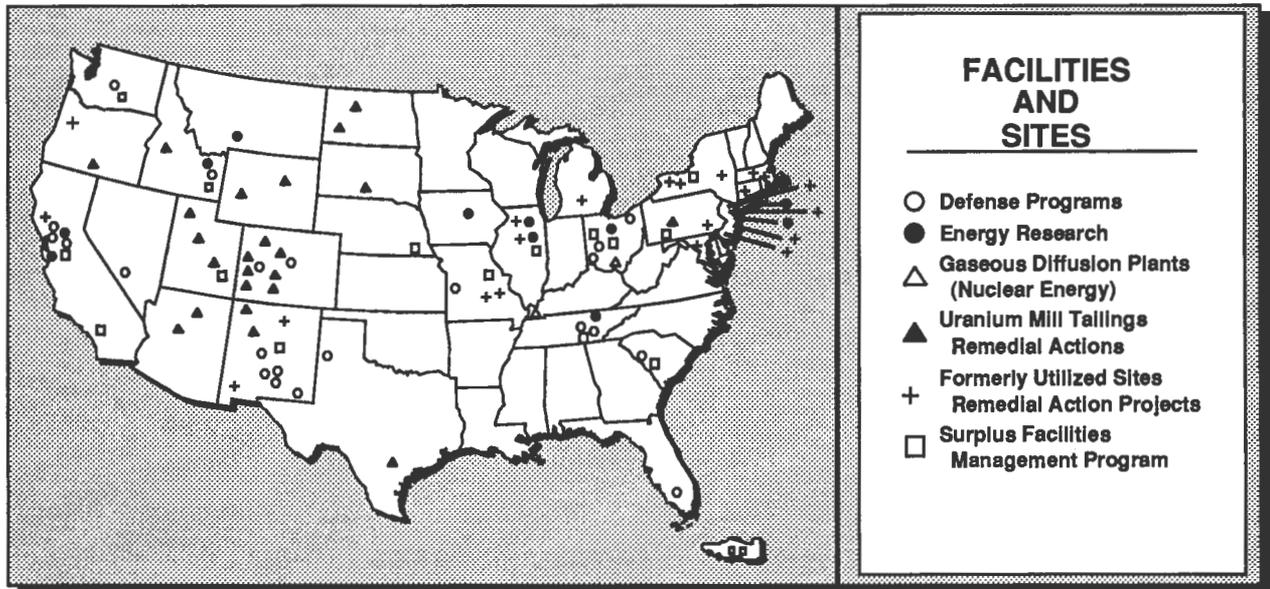


Figure 1.1. This Five-Year Environmental Restoration and Waste Management Plan, FY 1992-1996 addresses Environmental Restoration, Waste Operations, Corrective Activities, and Technology Development at nearly 100 sites located in 31 States and Territories.

1.2 GROWTH IN ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT COST ESTIMATES



The cost estimates requested by the field have increased significantly between the FY 1991-1995 and FY 1992-1996 Five-Year Plans for Environmental Restoration and Waste Management; these new cost estimates have not yet been fully validated. Such growth cannot now be managed responsibly and effectively, given the inadequacy of the DOE, contractor, industry, and regulator infrastructure.

The FY 1991-1995 Five-Year Plan represented the initial effort to identify, consolidate, and describe the full scope of work and corresponding funding requirements connected with the waste management and environmental restoration needs of DOE's nuclear complex. The FY 1992-1996 Five-Year Plan is the first update of the initial Plan. It has provided the first opportunity for DOE to reassess the program described in the initial Plan, assess the impacts of new regulatory requirements, and identify additional activities that are needed. Cost growth is to be expected as a normal consequence of this process; however, the cost estimates used in developing this FY 1992-1996 Plan exceed what is considered a manageable rate of growth. Cost estimates shown here for FY 1991 and 1992 are higher than were shown in the FY 1991-1995 Plan because (1) new activities have been added that were not within the original scope, (2) additional activities have been identified that fall within the original scope, and (3) estimates for program costs have increased. With respect to FY 1991 and FY 1992, the total estimated amounts set forth in this FY 1992-1996 Plan represent increases of \$1.1 billion and \$2.2 billion over the amounts set forth as a baseline for FY 1991 and FY 1992. The amounts estimated for FY 1993 and beyond exhibit similar increases over the baselines for those years. The FY 1991 baseline

corresponds to the President's budget submission to Congress. Baselines for FY 1992 and beyond correspond to amounts in the FY 1991-1995 Plan. These amounts challenge and almost certainly exceed the resources that can be brought to bear by DOE, its principal contractors, the environmental restoration and waste management industries, and State and Federal regulators.

Figure 1.2a shows the major sources of the higher estimates for FY 1991 and FY 1992. The cost estimate connected with each component of increase is comprised of two categories: a validated amount and an unvalidated amount. This breakdown is intended to facilitate cooperation and will be used to initiate discussions with interested parties; they have not been formally adopted by the Department. Validated amounts represent the result of a preliminary DOE Headquarters review of the field office cost estimates. The remaining unvalidated estimates require further review and analysis. In addition, the validated estimates represent, in the aggregate, the maximum feasible program level that the Department likely would have the ability to administer effectively. At this time (June 1990) the Department can provide only preliminary estimates of validated and unvalidated amounts associated with each component of increase.

Over the next several months as part of the FY 1992 budget process, the Department expects to develop more precise estimates of these increases. These estimates will then become the Department's starting point for budget discussions within the Administration. Those discussions will result in decisions on budget totals for FY 1992, the final amounts that will appear in the Administration's request to Congress.

For the period through FY 1995, the structure of the overall estimate for the programs included in this Plan are shown in Figure 1.2b. The figure shows (1) the FY 1991-1995 baseline, (2) validated amounts associated with new activities not within the scope of the FY 1991-1995 Plan, and (3) validated increases for activities within the scope of the FY 1991-1995 Plan. The total of (1), (2), and (3) is the total validated cost estimate for the programs described herein. Also shown are the total cost estimates submitted by DOE Operations Offices. The difference between these estimates and the total validated costs constitutes the unvalidated portion of the estimate. Lacking sufficient data, DOE cannot project total validated amounts beyond FY 1992.

Sources of Increase and Uncertainty: The category "revised estimates for planned activities" covers activities that were included in the FY 1991-1995 Plan and have revised cost estimates. Examples are operational testing for environmental compliance at Waste Isolation Pilot Plant (WIPP), continuity of waste operations at several of the sites, Consolidated Incinerator Facility (CIF) operations support at Savannah River, assessment and remediation at facilities and sites under the responsibility of San Francisco, and acceleration of the Hanford Waste Vitrification Plant.

Growth in "Agreements/Regulatory Compliance" includes new and existing agreements and growth due to regulatory requirements. Examples of these include the Tri-Party Agreement at Hanford; the Colorado Regulations at Rocky Flats; Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Agreement at Fernald; Resource Conservation and Recovery Act (RCRA) waste storage and CERCLA requirements at the Oak Ridge Gaseous Diffusion Plant (ORGDP) and the Y-12 Plant (Y-12); RCRA Permit at Los Alamos National Laboratory; and site investigations at Oak Ridge and Paducah.

The category "DOE Orders/Secretarial Initiatives" involves growth associated with implementation of DOE Orders, actions in response to findings of DOE "Tiger Team" assessments, and Secretary of Energy Notices. Examples include implementing DOE Order 5820.2A (Radioactive Waste Management) at ORGDP and Y-12, conducting Assessment and Remediation at Mound, and implementing new requirements connected with the 5400 series (Environment, Safety and Health) of DOE Orders.

"New Activities" includes such projects as compliance with the Toxic Substances Control Act at ORGDP, building a waste analysis laboratory for DOE, building a new waste treatment facility at Pantex, and making major modifications to the Consolidated Incinerator Facility at Savannah River.

Perhaps the most significant (and troubling) factor in driving up cost estimates has been increased awareness of and exposure to civil and criminal liabilities for DOE and contractor employees. DOE's January 26, 1990, Federal Register Notice of Proposed Rule

Making to cease indemnifying contractors for violations of environmental laws and regulations has led to contractors' conservative interpretations or regulatory requirements. The potential for personal criminal liability has made both DOE and contractor employees conservative in estimating their needs. In some cases, task needs have been included regardless of immediacy or technical basis to minimize personal and corporate liability exposure. Even though current disparities between field-generated needs and Headquarters' view of these needs will narrow, the disparity will continue to be significant because of the liability issue. DOE intends to work with the States to mitigate this problem.

Owing to the relatively early phase of planning connected with the activities described in the Plan, estimates in the Activity Data Sheets submitted by DOE's Operations Offices indicate a considerable degree of uncertainty about their cost and scope. With respect to Corrective Activities, their 68 percent of the estimates are characterized at a low or medium level of confidence. For Environmental Restoration and Waste Operations, the percentages are 79 and 54 percent, respectively.

Transportation activities, on the other hand, encompass a well-developed, mature (although comparatively speaking, small) program. Consequently, confidence in cost estimates for Transportation is accordingly higher, with 92 percent characterized at a high level of confidence.

Technology Development activities are in the early planning phase, but uncertainties in the estimates of cost are not of the same concern as for other programs. Technology Development estimates are

projected, not upon Operations Office requests, but upon the actual anticipated investment in the various technology areas. The requests from Operations Offices exceed, by design, the level of investment projected for the Technology Development program to enable selection of activities using the prioritization process described in Section 5.6.

Infrastructure Limitations: DOE's senior managers agree that the infrastructure needed to accomplish the work represented by the increases does not exist and will not exist for some time. DOE's new Office of Environmental Restoration and Waste Management is not fully staffed. Although staffing is proceeding as rapidly as practical, the organization will not be able to manage additional program increases for at least two years. Although DOE's Operations Offices have also embarked on similar expansions, they face a period of insufficient management and technical staff resources. Contractors are also growing and are beginning to experience shortages of qualified applicants. Judging from the amount of time now required for reviewing plans and permit applications, State and Federal regulators could not easily accommodate the increased work load embodied in the revised estimate.

DOE does not now know the precise resource limits of the cleanup industry, but it is aware of the concern that exists throughout government and the private sector. Preliminary estimates indicate that DOE and its contractors must increase staff to at least two and one-half times present levels. DOE is sponsoring research through the Oak Ridge Associated Universities and, separately, through The University of Tennessee, to evaluate the human and industrial resources available to meet the

anticipated demand for environmental cleanup.

DOE is informing the States, the Environmental Protection Agency (EPA), and Congress of the cost estimates identified by the Operations Offices and is working with these and other affected parties to plan and conduct cost-effective programs. DOE also wishes to benefit from the lessons learned by other Federal agencies, such as EPA and the Department of Defense, so the taxpayer pays only once for this experience. DOE intends to expend funds only when a clearly achievable work plan has been established. A key factor in judging the realism associated with any work plan is the degree of confidence placed in the associated estimated costs. DOE is exploring use of the Army Corps of Engineers to provide independent assessments of such costs. Furthermore,

DOE will not exceed its ability to manage such efforts effectively. While this approach may at first appear to slow progress in environmental restoration, overly aggressive effort (without a properly trained working staff) is irresponsible and may actually result in reduced protection of public health and safety and the environment. Government and commercial experience confirms that unrestrained growth is unmanageable. DOE must be responsible for the effective expenditure of funds. To assure the States, Congress, EPA, and other stakeholders that DOE is committed to maximum effective progress in compliance and cleanup, DOE will meet with them regularly to review plans and progress, to solicit their suggestions, and to listen honestly to their comments. In short, DOE is "placing all of its cards face up on the table." DOE's expectation is that others will do the same.

FY 1991 Plan	FY 1991 (\$ in Millions)			FY 1992 (\$ in Millions)		
	Total	Validated	Unvalidated ^A	Total	Validated	Unvalidated ^A
Priorities 1 - 3	3,024	2,882	142 ^B	3,403	3,403	0
Priority 4	<u>298</u>	<u>0</u>	<u>298</u>	<u>319</u>	<u>0</u>	<u>319</u>
Subtotal	3,322	2,882	440	3,722	3,403	319
<u>New Scope to Five-Year Plan</u>						
Transportation	15	15 ^C	0	19	19	0
Landlord for ID, RL, ORGDP	115	63 ^C	52	227	71	156
PUREX	34	34	0	123	123	0
Sanitary Landfill Activities	19	19 ^C	0	25	25	0
Agreements-In-Principle	28	28 ^D	0	28	28	0
Program Direction (HQ & Field)	<u>54</u>	<u>32</u>	<u>22</u>	<u>86</u>	<u>40</u>	<u>46</u>
Subtotal	265	191	74	508	306	202
<u>Cost Increases for Existing Scope</u>						
Revised Estimates for Planned Activities	159	84	75	481	220	261
Agreements/Regulatory Compliance	228	43	185	532	93	439
DOE Orders/Secretarial Initiatives	158	120	38	220	177	43
New Activities	91	11	80	198	10	188
Other	<u>61</u>	<u>0</u>	<u>61</u>	<u>76</u>	<u>0</u>	<u>76</u>
Subtotal	697	258	439	1,507	500	1,007
<u>Field Cost Estimates for FY 1992 Plan</u>	4,284	3,331	953	5,737	4,209	1,528
<u>Technology Development</u> ^E	156	156	0	230	230	0

A = Unvalidated is the difference between the total and the validated estimates of cost.

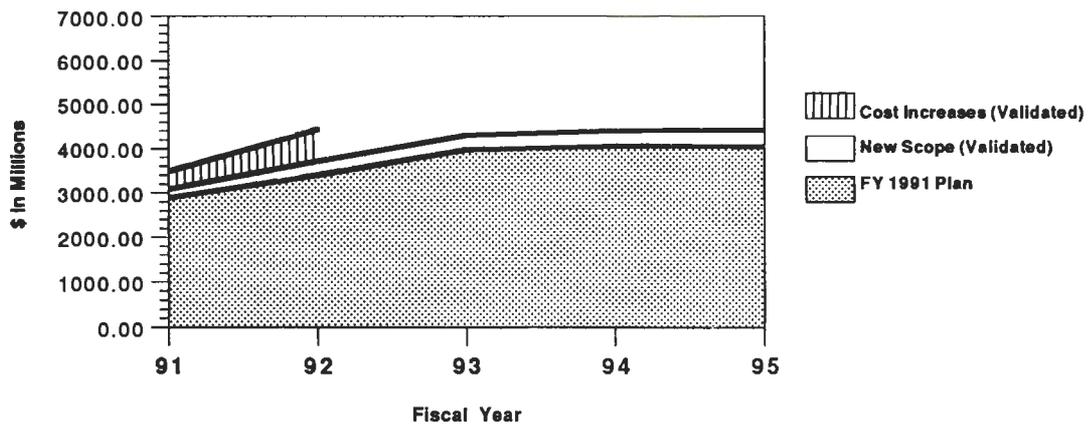
B = \$142 million is for Program slippage.

C = The validated costs for transportation, landlord, and sanitary landfill activities have been transferred from other parts of the DOE budget.

D = \$8.2 million of the program direction validated costs have been transferred from other parts of the DOE budget.

E = \$50 million for Technology Development is included in the FY 1991 Plan.

Figure 1.2a. The program request by the field has increased significantly between the FY 1991-1995 and FY 1992-1996 Five-Year Plans. This increase most likely exceeds the resources which can be brought to bear.



Funding Total (\$ in Millions)					
Fiscal Year	91	92	93	94	95
FY 1991 Plan	2,882	3,403	3,977	4,058	4,055
New Scope (Validated)	191	306	324	344	364
Cost Increases (Validated)	414	730			
Total Validated Estimates	3,487*	4,439*			
Field Cost Estimates (Includes Unvalidated Portion)	4,440*	5,967*	6,414*	6,800*	6,372*

*These estimates include funding and estimated costs for Technology Development.

Figure 1.2b. Cost estimates growth between baseline and current field cost estimates.

1.2.1 FUNDING INTELLIGENTLY IN THE FACE OF MAJOR UNCERTAINTIES AND LIMITED RESOURCES AND INFRASTRUCTURE



Field cost estimates for Environmental Restoration and Waste Management for FY 1991 and beyond are large, have not yet been fully validated, and represent activities likely to outstrip the capability of the Department's infrastructure to manage effectively and in the public interest. DOE will work with the States, Indian Nations, and others to develop work plans that are clearly achievable, cost effective, and directly address the highest priority protection of worker and public health and safety and the environment.

The contrast between the magnitude of environmental compliance and cleanup problems and the resources that can be effectively brought to bear to resolve them is not unique to DOE. It is a national issue requiring a national solution. Although differing in a number of important respects, the Environmental Protection Agency's (EPA) Superfund program is a case in point. The remediation objectives of DOE's program are the same as those of Superfund. Indeed, 15 of DOE's installations, including the largest, are already included on the Superfund's National Priorities List.

On page 8 of the EPA Administrator's Management Review of the Superfund Program (90-Day Report, 1989), under the heading "The Challenge Ahead," appear words applicable to DOE: "Superfund's problems are tough and will not be soon or easily solved. Balancing competing statutory goals, getting the most from an apparently huge but actually limited resource pool, rewarding and retaining a top-notch Federal technical staff, and ensuring first-rate work in the public interest by teams of contractors with divided interests, while only parts of the challenge, nevertheless make up a formidable agenda."

In an attempt to respond to the many pressing problems facing the Department in

the areas of environmental restoration and waste management, DOE must learn from the experience of others, avoid their mistakes, and seek to avoid making significant mistakes of its own by maintaining focus on overall program objectives and recognizing problems and negative trends early.

Expectations, Realism, and Responsibility: Commenting on the FY 1991-1995 Five-Year Plan, the National Academy of Sciences (NAS) Board on Radioactive Waste Management emphasized, among other things, that "Public trust can be won only by clear and credible progress toward environmental cleanup. Therefore, the Plan should be careful not to raise unreasonable expectations by promising more extensive cleanup, or a shorter timetable, than can realistically be achieved." (See Appendix C1 for the full text of NAS comments and DOE responses.)

In the EPA Administrator's report noted earlier, the significance of realism is also highlighted. "Both success and failure are relative, the final determination being a function of expectations as much as of performance. If Superfund is perceived so far to have been a high-cost disappointment, it is largely because program performance has not met high, and perhaps unrealistic expectations."

What is "unrealistic" is difficult to define so as to satisfy all interested parties and observers. Nevertheless, it is clear that DOE has raised expectations without satisfying them. It is also clear that the funding requests submitted by the field for the FY 1992-1996 Five-Year Plan represent more than the Department can spend effectively and responsibly. (In this regard, see Section 1.2 concerning validated and invalidated cost estimates.)

Progress has been slow on the development of a nationally acceptable, rigorous, risk-based system for prioritizing compliance and cleanup activities. (See Section 1.4.1.) But the lack of such a system does not relieve DOE of its responsibility to proceed as intelligently as possible. With or without a formal decision-aiding methodology, DOE must distinguish what is smart to do from what is not smart. DOE will work with the States, Indian Nations, and other interested parties to establish an agreed approach to pursuing what is smart. DOE recognizes that solving its problems and meeting its goal of compliance and cleanup by the year 2019 will require an enormous amount of realism, honesty, plain speaking, and cooperation among DOE, affected States, Indian Nations, the Administration, other Federal agencies, the Congress, and the public.

What Is Not Smart?

- Groundwater well drilling and other characterization efforts without a clear rationale for the number and location of samples necessary and sufficient for cleanup to start.

The current emphasis on installing groundwater characterization wells may actually increase risks to the public and/or the environment. Based on current plans, the Department would install nearly 1500

wells in FY 1991 under its Environmental Restoration program. Placing wells simply on the basis of rigor inferred from regulations detracts from efforts to design efficient characterization plans, leads to a data explosion yielding diminishingly useful returns, and most importantly provides potential new pathways for contaminants to migrate throughout the very groundwater the Department seeks to protect.

- Planning for a sampling and analysis program that exceeds the capacity of the system to support it.

There are significant uncertainties about the capacity of existing laboratories to analyze DOE mixed radioactive and hazardous samples. Until this uncertainty can be resolved, it is counterproductive for DOE to plan or commit to characterization schedules that cannot be met.

- Trying to manage, with too few qualified managers, more work than there are qualified workers to do.

The total of validated and invalidated estimates for cleanup and waste management for FY 1991 and beyond involves very large sums of money. Ignoring any questions of their accuracy and the availability of effective technology to achieve the needed degree of cleanup and waste management, there is nothing close to the required infrastructure available to manage and implement these solutions. Not only is DOE understaffed at Headquarters and throughout its Operations Offices, but the EPA regions, the States, and the remediation contractors are also understaffed--and are all competing for the same scarce human resources. DOE Headquarters will not be fully staffed for two to three years, and the national demand could easily take a decade to supply.

- Spending money on problems without sound cost verification.

The Nation's (not only DOE's) environmental compliance and cleanup efforts, and the management of these activities, are immature. There has not been sufficient time or experience nationwide to develop verified cost and scope estimates. DOE must be assured that it--and thereby the public it is mandated to serve--gets the most effective use of its limited fiscal resources.

- Allowing uncontrolled program growth to impact DOE's ability to conduct the program in an effective manner.

The environmental restoration programs for the Department of Defense (DOD), DOE, and EPA have grown significantly over the past several years. The combined growth rate of these programs from FY 1989 to FY 1991 is 45 percent. The human resources and industrial and analytical capacity do not exist to continue to support this type of growth.

What is Smart?

- Bias for action - avoiding excessive characterization; starting needed cleanup as soon as possible.

Activities must focus on eliminating or reducing known or recognized potential risks to worker and public health and the environment. Examples are actions to remove contamination source terms, contain or isolate known or suspected onsite contamination (pending development and application of effective remedial actions), and isolate, remove, or detoxify offsite contamination. While these concepts are certainly embodied in the commitments the Department has made to the public to date, it is not clear they have received the proper emphasis in the

Department's regulatory agreements or field work plans.

During the review of an earlier draft of this Plan, EPA encouraged DOE to use the planning process to seek options for early action. A bias for action means do sufficient assessment to determine if there is a near-term risk to human health and safety or the environment; if so, then immediately undertake sufficient cleanup action to abate the near-term threat; if not, then place continuing assessment and subsequent cleanup on a longer schedule. Such immediate cleanup may not address all aspects of site contamination but would address that portion posing the near-term risk. After abating the immediate threat, further assessment and cleanup can be undertaken on a longer schedule.

The Environmental Restoration program is still in the phases of problem definition and remedy identification, and decision makers seem willing to make decisions on remediation only when uncertainty and risk are minimal. The tendency is to lose sight of the point at which continued characterization becomes excessive and counterproductive. This trend, though well intentioned, is disturbing and likely to be detrimental to the protection of worker and public health and safety and the environment.

The Department believes that remedial actions can generally be initiated at its sites with much less characterization than currently proposed and with little, if any, additional risk as to the ultimate success of the remedy.

Interim remedial actions, where appropriate, and application of the "Observational Approach" are smart ways to proceed. This technique, pioneered in the oil and gas exploration industries and large public works projects and in use since

early in this century, would allow cleanup work to start sooner than with a rigorous application of conventional methods. In addition, this technique is expected to yield lower overall costs by permitting flexible response to new characterization information during the implementation of a remedy. A reasonable range of contingencies in conditions affecting remedial action is recognized and accounted for in the remediation process under this technique. Under the more rigid conventional approach, remediation design typically is forced to account for nearly all possible contingencies. Such rigidity only builds delays and excessive cost into project plans.

- Beginning now to deal with the need for added analytical laboratory capacity.

Adequate characterization of DOE's sites and facilities depends directly on the Department's capability for carrying out a large number of sample analyses of the right kind and of the right quality and consistency. In contrast to other cleanup programs, such as EPA's Superfund Program, DOE's requirements are also unique in that a major fraction of the needed analyses may involve the detection and identification of radioactive substances. To provide a basis for increasing requisite laboratory capacity, DOE is assessing its needs relative to the expected increase in the number of samples needing analysis over the next five years. Furthermore, to ensure capability for constant processing with no shortfall in capacity, the Department is working with EPA, the Nuclear Regulatory Commission, and DOD to coordinate their needs with DOE's.

- Supporting the education of new scientists, engineers, managers, and workers and retraining those whose jobs are threatened by production shutdowns and cutbacks.

Not since Sputnik set off a massive national scientific and technical education effort in the late 1950s has there been such a large and pressing need to build an educated and reeducated human resource base. In effect, we need a second Space Program, this time, for the space where we live. As part of its Technology Development Program, DOE is implementing a comprehensive educational and outreach program in science and technology to increase the talent pool available for site cleanup and waste management needs (Section 5.7).

- Verifying cost estimates internally and externally.

The problems of estimating costs were highlighted in the recent Office of Technology Assessment Draft Report, Status of Site Assessments. "One of the difficulties in estimating remediation costs is that an historical data base, similar to that which exists for construction projects, is not available.... Cost accounting methods for these DOE EM [remediation] projects have not lent themselves to the creation of such a database. Several interested parties suggested that the creation of a unit cost accounting system for environmental activities would prove extremely useful for future cost estimation efforts.

(Interestingly, the EPA also has no standardized unit cost accounting method for CERCLA or RCRA cleanups.)" The DOE EM Office of Quality Assurance and Quality Control is performing an independent internal evaluation of the cost and scope of several major Environmental Restoration projects. To take advantage of its relevant experience, DOE is using the Army Corps of Engineers and is exploring use of other third parties to independently verify the project costs for assessment and cleanup activities.

- Working with the Administration and the Congress to establish procedures to accommodate unexpected changes in funding requirements.

The experience with the FY 1992-1996 Five-Year Plan clearly demonstrates the dynamic nature of the DOE Environmental Restoration and Waste Management Program. It is likely that there will be a continuing series of unexpected changes as implementation of the program proceeds. It is extremely difficult in this type of environment to adhere to the traditional Federal budget process, which requires budget estimates to be prepared as much as 18 months in advance of expenditure and requires that Federal appropriations be controlled within extremely narrow budget line items. New budgetary mechanisms are needed to permit DOE greater flexibility to respond swiftly and effectively to unexpected changes without compromising the accountability and financial integrity of the Federal budget process. Section 1.9 discusses one possible option, the creation of a near-term response fund to allow DOE to respond quickly to sudden compliance and cleanup needs as they arise. DOE is assessing the feasibility of this as well as investigating proposals for other alternatives such as multi-year budgeting or a single appropriation account. DOE's aggressive steps toward policing its own operations and toward opening its doors to outside scrutiny make sound policy and underscore the need for new approaches.

- Investing in technology development, with an immediate and vigorous emphasis on waste minimization and waste avoidance.

Significant funding for technology development is a wise investment. (See Sections 1.16 and 5.) Many technology development projects are likely to fail or be only partially successful, which is typical of

virtually all complex technical arenas. But to refrain from such investment in the short term is to incur a penalty over the long term. Waste minimization and waste avoidance technologies--whether by chemical substitution, process modification, or administrative controls--are the only hope for preventing passing on to future generations the legacy DOE has inherited from its past. DOE is making this investment, approximately eight to ten percent of EM's annual budget, to realize these benefits (Section 1.5.1).

- Keeping an open door, an open ear, and an open mind--and asking all stakeholders to do the same.

DOE's culture is changing and must continue to change, both within the Department and in its dealing with external interested parties and the public. Likewise, the culture of the interested parties is changing and must continue to change. Cautious optimism on everyone's part is the appropriate starting point. DOE is taking steps to expand external review of its activities, for example, through the State and Tribal Government Working Group, the Stakeholders Forum, public review of Five-Year and Site-Specific Plans and increased support of State oversight. (See Sections 1.14, 1.15, and 1.15.1.)

- Improving risk communications.

In the EPA Administrator's report noted earlier, it is stated that the public wants to be protected from risks associated with living near a contaminated site. DOE needs to improve its ability to explain the risks to the public in ways that can be easily understood. This will enable the public to participate in the decision-making process in a more meaningful way. DOE is implementing a program of public participation in EM's decision-making process. An essential element of this

program is the preparation of and public involvement in the Public Participation Plans to be part of the Site-Specific Plans,

developed for each of DOE's major installations (Section 1.15.1).

1.3 GOALS AND COMMITMENTS



This section reaffirms "proposed actions" from Section 1.1.1 of the FY 1991-1995 Five Year Plan, dividing them into two categories: goals, which cannot be fulfilled all at once or by a small set of discrete actions, and commitments for FY 1990, some of which appeared last year but without completion dates.

Reaffirmed Goals:

- Clean up and restore the environment at DOE's nuclear sites by 2019.
- Comply with laws and regulations aimed at protecting public health and the environment.
- Contain known contamination at inactive sites and vigorously assess the uncertain nature and extent of contamination at other sites to enable realistic planning, scheduling, and budgeting for cleanup.
- Support the establishment of interagency agreements and fulfill the requirements of compliance agreements already in place.
- Continue to expand the public participation process. (See Section 1.15.1.)
- Change DOE culture to one of clear and open communication.
- Work diligently to achieve congressional support for the Plan's objectives.
- Recognize Tribal sovereignty and treaty rights related to Tribal and ceded lands.
- Continually examine environmental regulations to ensure that DOE's compliance actions effectively reduce risk to human health and the environment.
- system in May-June 1990 to help formulate the FY 1992 budget request. (See Section 1.4.1.)
- Release, for independent scientific analysis, the health records of workers at DOE facilities and conduct public health risk assessments of plant sites for past, present, and future operations. (See Section 1.15.)
- Establish an Applied Research and Development Program. This commitment has been achieved by the creation of the Office of Technology Development within the Office of Environmental Restoration and Waste Management (EM). (See Section 5.)
- Implement programs to minimize current waste generation and future waste disposal requirements. In FY 1990, EM will coordinate the implementation of field site waste minimization plans required by DOE Orders 5820.2A and 5400.1.
- Take innovative steps to develop the human resources needed to implement compliance and cleanup activities. In FY 1990, DOE inaugurates its new education initiatives by funding two pilot partnerships (in South Carolina and New Mexico), preparing a procurement action to add other academic partnerships, and establishing vigorous educational outreach programs at all eight Operations Offices. (See Section 5.7.)
- Enter into Agreements-in-Principle with States that host DOE facilities to help

Reaffirmed and New Commitments for FY 1990:

- Develop an interim national prioritization system for cleanup activities based on initial State, Tribal, and other public involvement; apply the

fund the cost of environmental monitoring of DOE's cleanup and compliance activities.

- Explore the concept of establishing a Near-Term Response Fund as well as other options to accommodate unplanned funding needs. (See Section 1.9.)
- Evaluate options for improving the process of contracting for remedial actions. (See Section 3.1.3.2.)
- Establish a liability Task Force to address liability issues associated with environmental restoration and waste

operations activities. Issues include budget planning to ensure compliance with environmental regulations and interagency agreements and permits, contractor liability associated with Plan activities, and DOE employee liability associated with environmental restoration and waste management. The Task Force will function through the spring of 1990 and assist in developing written policy and guidance.

- Establish individual and facility awards for the achievement of excellence in environmental activities.

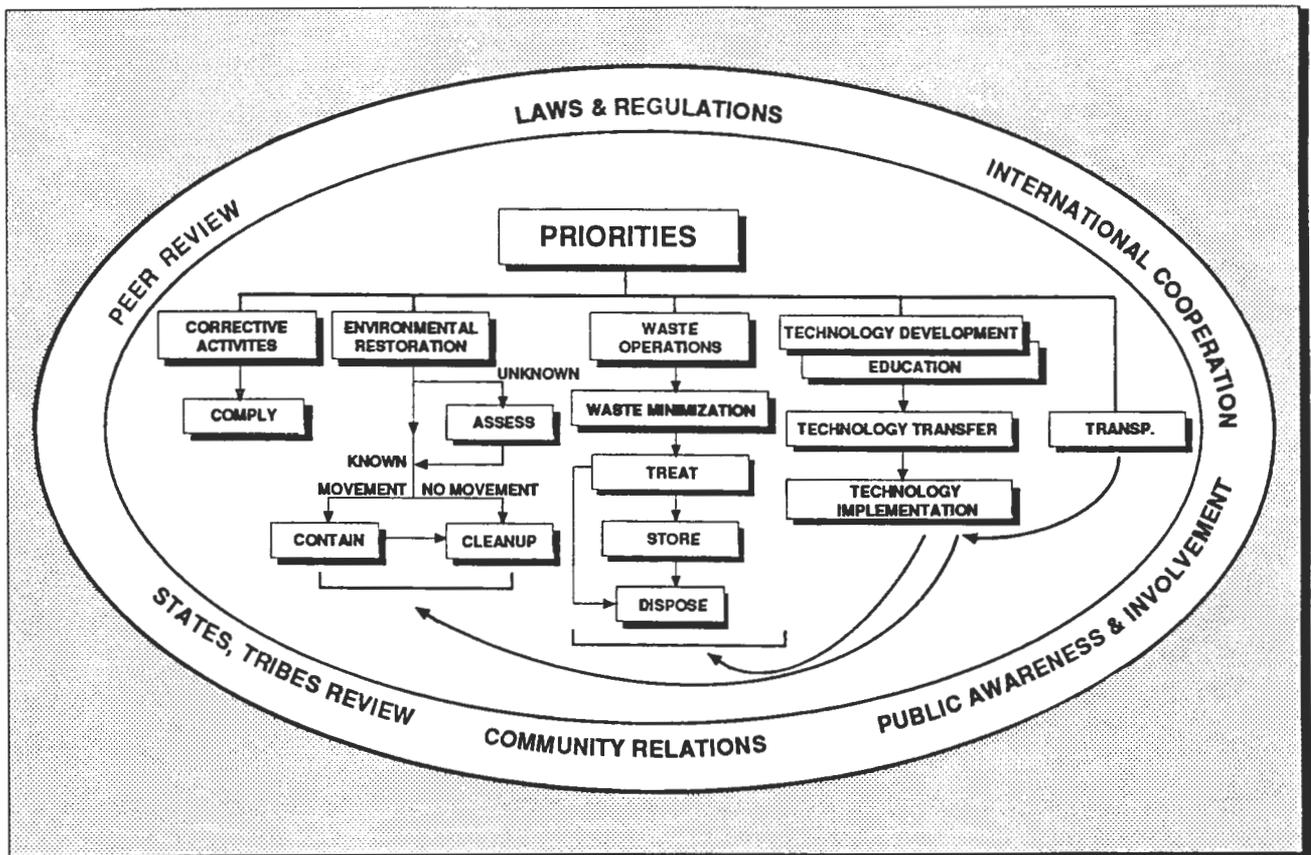


Figure 1.3. The Department of Energy's priorities for Corrective Activities, Environmental Restoration, Waste Operations, Technology Development (including Education), and Transportation are set within a context of laws and regulations, public awareness and involvement, and technical peer review.



The Five-Year Plan reflects the Department's interim prioritization and estimates for funding the costs connected with existing environmental problems; ensuring compliance with applicable local, State, and Federal requirements and agreements; effectively executing the Department's waste management programs; and conducting the technology development associated with these activities.

Because of the magnitude of DOE waste operations, cleanup, and technology development programs, it is essential that a DOE-wide priority system be developed to guide activities and to support budget requests. The actions DOE has initiated for developing priority systems for environmental restoration activities are discussed in the following section. A separate prioritization system is also being developed for Waste Operations to prioritize ongoing activities and reflect regulatory compliance in the broadest sense. One approach being considered is to break the existing four priority levels into discrete sublevels; another is to develop a ranking based on direct health, safety, environmental, and regulatory risk. The system selected will be applied to next year's Five-Year Plan.

The Plan continues to group activities into four priority categories as developed for the first Plan. These priorities are applied to environmental restoration and waste operations. All corrective activities are defined as Priority 1 to achieve compliance on an expedited basis.

Priority 1: Priority 1 includes activities necessary to prevent near-term adverse impacts to workers, the public, or the environment. Examples include containment to prevent the spread of contamination, actions to prevent or minimize releases to the environment, and ongoing waste operations activities

required to maintain safe conditions. Also included as Priority 1 are ongoing activities that, if terminated, could result in significant program and/or resource impacts. Impacts could include significantly increased risk to the environment or to workers or significantly increased costs.

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

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

Priority 4: Priority 4 includes activities that are not required by regulation but would be desirable. Examples of Priority 4 actions include complying with DOE Orders that are more stringent than external regulations, implementing improved

management practices, reducing personnel exposures below levels required by regulations or standards, and accelerating actions to satisfy an agreement or milestone ahead of schedule.

Estimated funding for technology development activities is set at approximately 10 percent of the total program budget for environmental restoration and waste operations. Prioritization of competitive technology development proposals is intended to select top-ranked activities that best improve environmental restoration and waste management operations. For FY 1990, technology development activities were selected for funding with the aid of recommendation from expert review groups.

In FY 1991, the Office of Technology Development will develop a prioritization

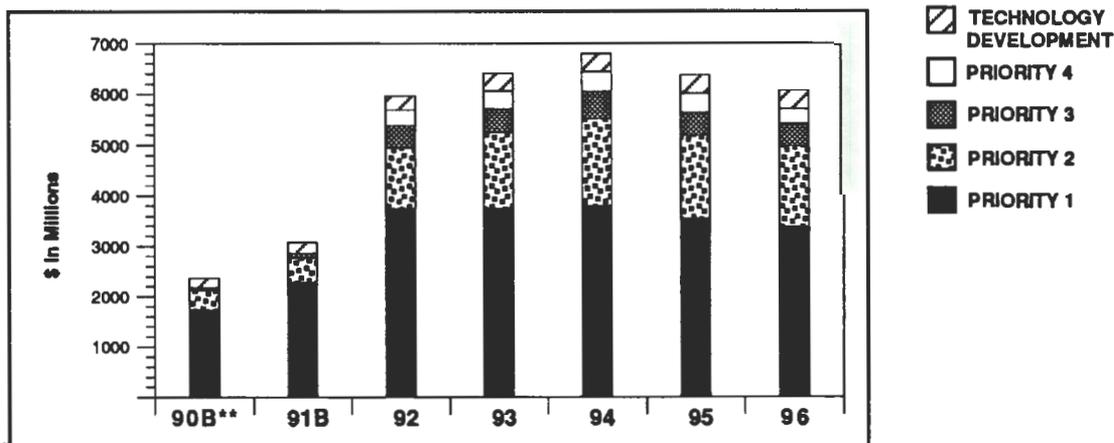
and selection process that will include a more rigorous environmental restoration and waste management needs analysis. Because of the requirements for transportation to support all ongoing Departmental shipping, all transportation operations activities are Priority 1. Transportation technology development priorities will follow guidelines of the priority system to be established for the Technology Development Program.

Estimates of FY 1990 and FY 1991 funding and, for FY 1992 and beyond, estimates of costs for activities described in this Five-Year Plan are shown in Figure 1.4a. Corresponding estimates for each of the categories of activities are shown separately in Figures 1.4b-1.4f. The estimates contain both validated and unvalidated amounts. (See Section 1.2 concerning validated and unvalidated cost estimates.)

TOTAL FUNDING AND ESTIMATES OF COSTS

NOTE: Validated estimates have been identified that exceed the amount set forth for the FY 1991 President's budget by approximately \$500 million. \$1,528 million of the total field estimates set forth for FY 1992 is unvalidated. The estimates for FY 1993 and beyond include both validated and unvalidated amounts. (See Section 1.2 regarding validated and unvalidated cost estimates.)

Funding and Estimates of Costs By FIELD OFFICE - Fiscal Year (\$ In Millions)*							
OFFICE	1990B**	1991B	1992	1993	1994	1995	1996
Albuquerque	256.3	360.4	806.5	801.6	751.3	661.3	598.2
Chicago	27.9	62.2	72.9	61.2	73.3	67.5	62.8
Headquarters	75.9	143.2	379.3	529.1	525.9	397.7	398.5
Idaho	300.3	368.5	718.1	657.4	600.7	519.5	582.1
Nevada	11.1	23.6	66.7	87.5	127.4	121.5	124.4
Oak Ridge	416.5	567.0	1,214.1	1,407.8	1,637.1	1,634.0	1,492.8
Richland	429.9	627.3	1,302.3	1,384.5	1,514.2	1,460.0	1,325.2
Rocky Flats	135.9	89.2	166.9	192.9	195.6	189.1	191.9
San Francisco	48.3	50.6	137.8	161.3	127.3	89.9	67.6
Savannah Riv	474.7	585.3	822.1	777.2	888.3	871.9	863.7
Tech. Dev.	186.3	206.0	280.3	353.0	359.0	359.0	359.0
TOTAL	2,363.0	3,083.1***	5,966.9	6,413.5	6,800.2	6,371.6	6,066.0



Funding and Estimates of Costs By PRIORITY - Fiscal Year (\$ in Millions)*							
	1990B**	1991B	1992	1993	1994	1995	1996
Priority 1	1,742.0	2,284.1	3,757.6	3,743.6	3,799.8	3,542.1	3,386.8
Priority 2	385.9	498.1	1,181.7	1,517.6	1,717.7	1,640.0	1,592.8
Priority 3	42.1	90.0	443.9	451.7	533.5	457.3	435.4
Priority 4	6.6	4.9	303.4	347.6	390.2	373.2	292.0
Tech. Dev.	186.3	206.0	280.3	353.0	359.0	359.0	359.0
TOTAL	2,363.0	3,083.1***	5,966.9	6,413.5	6,800.2	6,371.6	6,066.0

* Numbers may not add up to totals due to rounding.

** Includes Congressional add on.

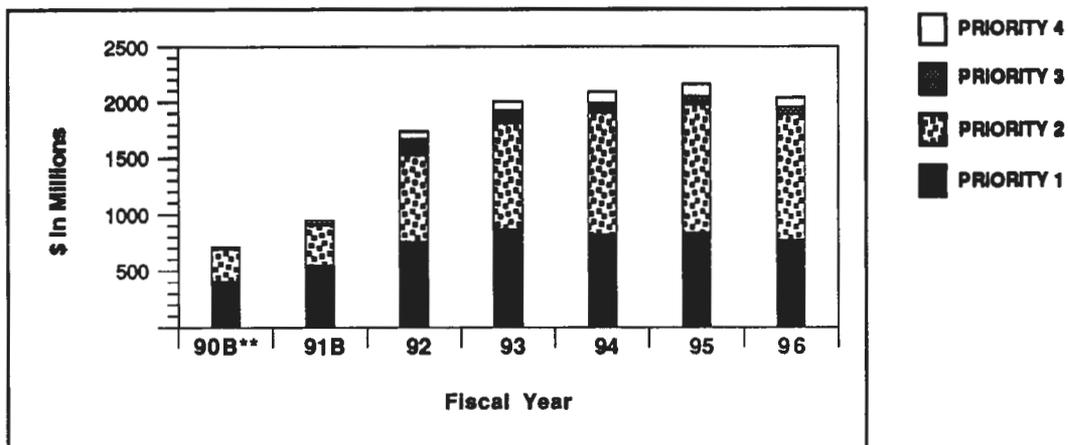
*** Includes transportation, uranium enrichment, landlord, and program slippage.

Figure 1.4a. TOTAL FUNDING and ESTIMATED COSTS of the Plan's activities represents a significant national commitment.

ENVIRONMENTAL RESTORATION and ESTIMATES OF COSTS

NOTE: Validated estimates have been identified that exceed the amount set forth for the FY 1991 President's budget by approximately \$500 million. \$1,528 million of the total field estimates set forth for FY 1992 is unvalidated. The estimates for FY 1993 and beyond include both validated and unvalidated amounts. (See Section 1.2 regarding validated and unvalidated cost estimates.)

Funding and Estimates of Costs By FIELD OFFICE - Fiscal Year (\$ In Millions)*							
OFFICE	1990B**	1991B	1992	1993	1994	1995	1996
Albuquerque	109.8	161.9	360.6	421.3	356.4	294.9	213.7
Chicago	11.5	34.7	43.2	41.3	46.7	41.0	24.0
Headquarters	45.0	59.3	57.7	56.2	55.4	57.3	59.4
Idaho	81.0	75.6	127.5	106.8	89.6	82.7	88.6
Nevada	2.8	14.1	41.9	63.8	101.7	102.4	108.3
Oak Ridge	239.2	370.1	690.9	856.8	904.4	988.7	907.1
Richland	84.4	101.9	225.6	280.6	343.0	381.2	413.8
Rocky Flats	57.8	40.5	45.7	30.2	45.2	46.8	62.8
San Francisco	22.8	29.4	60.0	43.1	26.4	23.1	17.2
Savannah River	60.9	62.4	84.4	109.8	122.3	143.3	145.6
TOTAL	715.2	949.8	1,737.4	2,009.9	2,091.0	2,161.1	2,040.4



Funding and Estimates of Cost By PRIORITY - Fiscal Year (\$ in Millions)*							
	1990B**	1991B	1992	1993	1994	1995	1996
Priority 1	412.7	551.7	759.7	866.2	823.9	838.8	776.7
Priority 2	277.9	349.9	770.8	945.7	1,084.3	1,137.9	1,111.1
Priority 3	20.1	47.2	140.3	110.2	80.4	77.5	63.4
Priority 4	4.5	1.1	66.6	87.9	102.5	106.9	89.2
TOTAL	715.2	949.8	1,737.4	2,009.9	2,091.0	2,161.1	2,040.4

* Numbers may not add up to totals due to rounding.

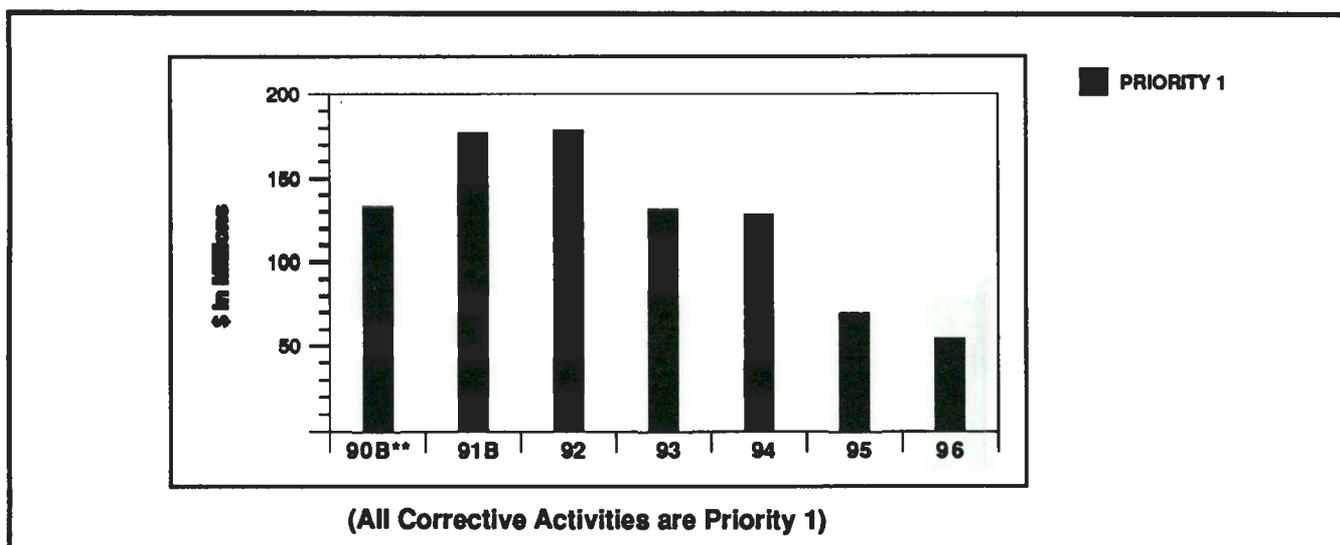
** Includes Congressional add on.

Figure 1.4b. Funding and estimated costs for ENVIRONMENTAL RESTORATION increase as assessments conclude and remediations begin.

CORRECTIVE ACTIVITIES

NOTE: Validated estimates have been identified that exceed the amount set forth for the FY 1991 President's budget by approximately \$500 million. \$1,528 million of the total field estimates set forth for FY 1992 is unvalidated. The estimates for FY 1993 and beyond include both validated and unvalidated amounts. (See Section 1.2 regarding validated and unvalidated cost estimates.)

Funding and Estimates of Cost By FIELD OFFICE - Fiscal Year (\$ in Millions)*							
OFFICE	1990B**	1991B	1992	1993	1994	1995	1996
Albuquerque	20.3	20.9	28.0	12.0	12.5	13.9	6.2
Chicago	5.3	10.2	10.2	1.9	0.6	0.6	0.6
Idaho	7.8	14.0	7.0	5.0	5.0	3.0	1.0
Nevada	1.7	0.8	1.7	0	0	0	0
Oak Ridge	30.9	55.7	61.4	63.2	73.9	31.4	32.9
Richland	18.3	22.0	24.8	13.0	11.2	11.2	11.2
Rocky Flats	1.8	1.4	2.9	6.2	2.4	0	0
San Francisco	6.6	5.4	24.0	29.3	22.2	8.7	2.4
Savannah River	39.4	46.6	17.6	0	0	0	0
TOTAL	132.3	177.1	178.5	130.5	127.8	68.8	54.1



Funding and Estimates of Costs By PRIORITY - Fiscal Year (\$ in Millions)*							
	1990B**	1991B	1992	1993	1994	1995	1996
Priority 1	132.3	177.1	178.5	130.5	127.8	68.8	54.1
TOTAL	132.3	177.1	178.5	130.5	127.8	68.8	54.1

* Numbers may not add up to totals due to rounding.

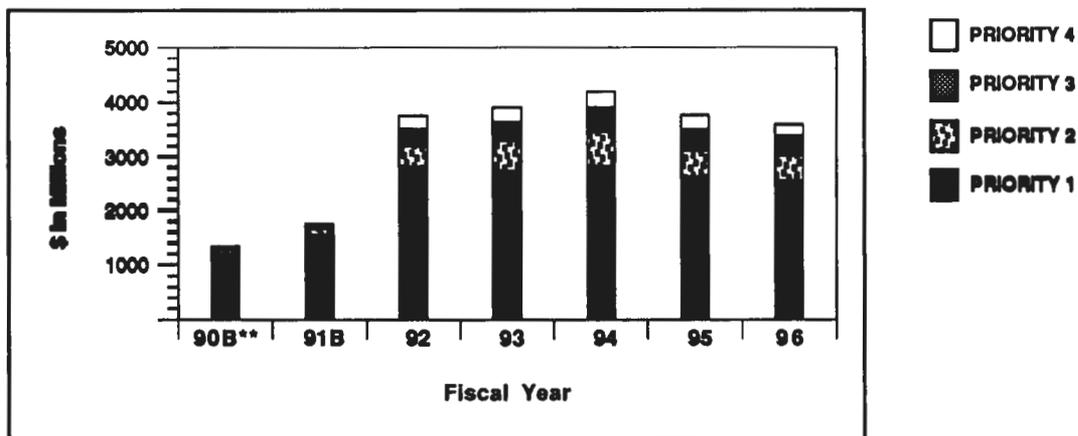
** Includes Congressional add on.

Figure 1.4c. The funding and estimated costs for **CORRECTIVE ACTIVITIES** are intended to resolve all identified out-of-compliance conditions at Department of Energy facilities.

WASTE OPERATIONS

NOTE: Validated estimates have been identified that exceed the amount set forth for the FY 1991 President's budget by approximately \$500 million. \$1,528 million of the total field estimates set forth for FY 1992 is unvalidated. The estimates for FY 1993 and beyond include both validated and unvalidated amounts. (See Section 1.2 regarding validated and unvalidated cost estimates.)

OFFICE	1990B**	1991B	1992	1993	1994	1995	1996
Albuquerque	121.9	171.8	409.3	359.6	373.3	343.7	370.3
Chicago	10.9	17.2	19.3	17.6	25.6	25.5	37.6
Headquarters	29.3	81.9	319.6	470.9	468.4	338.3	336.9
Idaho	211.4	278.9	583.6	545.6	506.2	433.8	492.5
Nevada	6.5	8.6	22.8	23.4	25.4	18.8	15.8
Oak Ridge	142.8	137.7	456.8	482.4	653.4	608.6	547.5
Richland	324.7	499.7	1,047.7	1,085.6	1,155.5	1,063.1	895.7
Rocky Flats	76.3	47.3	118.3	156.5	148.0	142.4	129.0
San Francisco	18.9	15.7	53.8	88.9	78.8	58.1	48.0
Savannah River	374.4	476.2	720.2	667.4	766.0	728.7	718.1
TOTAL	1,317.2	1,735.0	3,751.3	3,898.0	4,200.5	3,760.9	3,591.3



	1990B**	1991B	1992	1993	1994	1995	1996
Priority 1	1,191.1	1,548.3	2,810.5	2,737.4	2,838.6	2,624.9	2,546.4
Priority 2	103.7	142.4	403.3	563.2	624.3	493.4	473.6
Priority 3	20.2	40.4	300.8	337.6	449.8	376.4	368.5
Priority 4	2.1	3.8	236.8	259.8	287.8	266.2	202.8
TOTAL	1,317.2	1,735.0	3,751.3	3,898.0	4,200.5	3,760.9	3,591.3

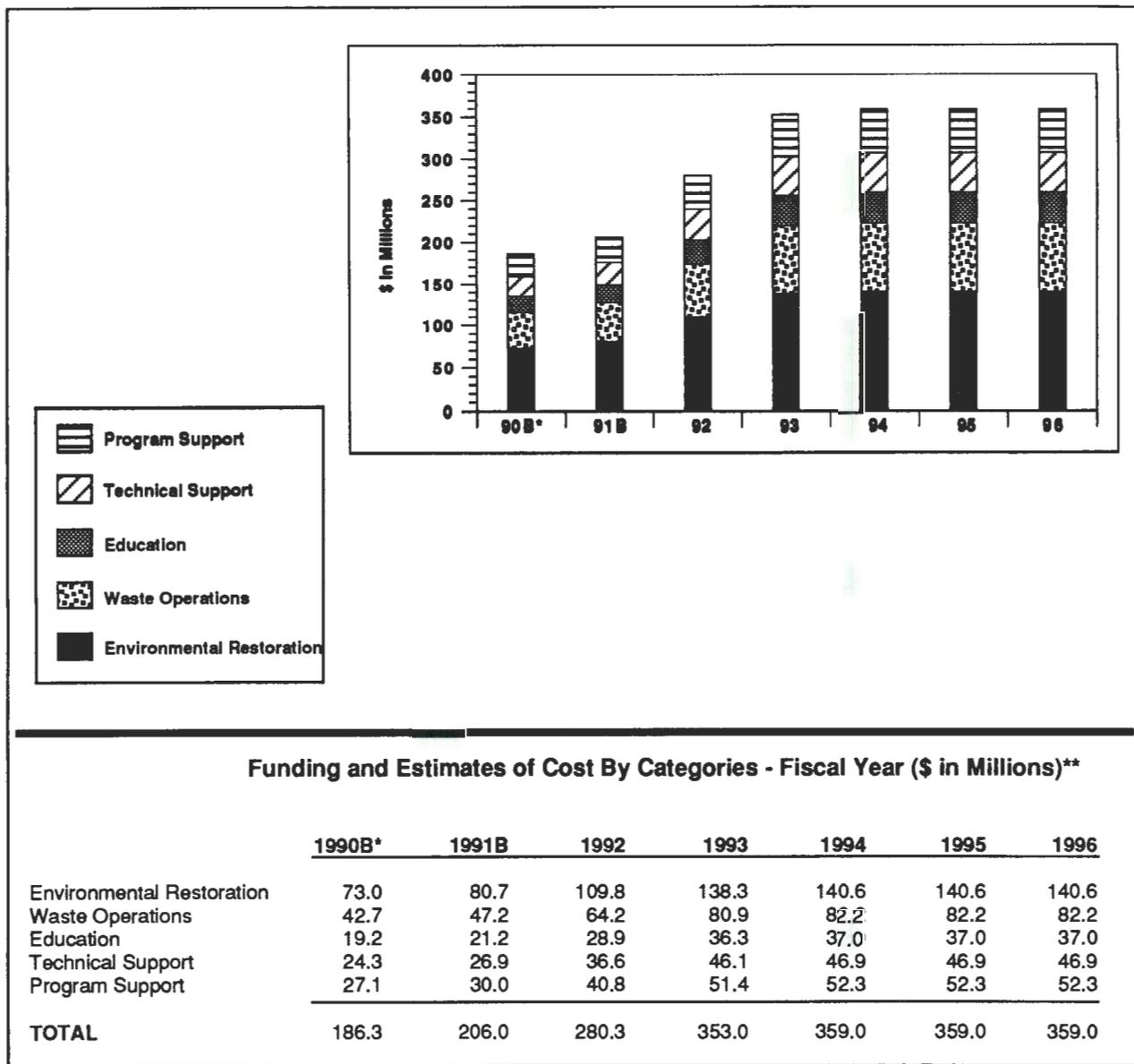
* Numbers may not add up to totals due to rounding.

** Includes Congressional add on.

Figure 1.4d. The funding and estimated costs for WASTE OPERATIONS is primarily for ongoing activities including treatment, storage, disposal and minimization of all types of wastes produced by Department of Energy (DOE). Funding also includes DOE's annual contribution to the Nuclear Waste Fund.

TECHNOLOGY DEVELOPMENT

NOTE: Validated estimates have been identified that exceed the amount set forth for the FY 1991 President's budget by approximately \$500 million. \$1,528 million of the total field estimates set forth for FY 1992 is unvalidated. The estimates for FY 1993 and beyond include both validated and unvalidated amounts. (See Section 1.2 regarding validated and unvalidated cost estimates.)



* Includes Congressional add on.

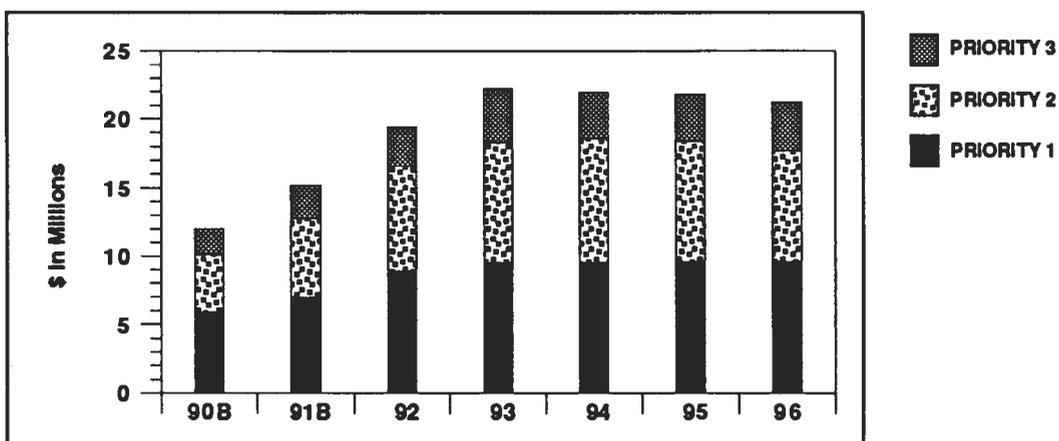
** Numbers may not add up to totals due to rounding.

Figure 1.4e. Funding and estimated costs for **TECHNOLOGY DEVELOPMENT** responds to needs for safer, faster, more effective, and less costly solutions to the Department of Energy's environmental restoration and waste management problems.

TRANSPORTATION MANAGEMENT

NOTE: Validated estimates have been identified that exceed the amount set forth for the FY 1991 President's budget by approximately \$500 million. \$1,528 million of the total field estimates set forth for FY 1992 is unvalidated. The estimates for FY 1993 and beyond include both validated and unvalidated amounts. (See Section 1.2 regarding validated and unvalidated cost estimates.)

OFFICE	1990B	1991B	1992	1993	1994	1995	1996
Albuquerque	4.2	5.8	7.7	8.8	9.1	8.8	8.1
Chicago	0.2	0.2	0.2	0.4	0.4	0.5	0.6
Headquarters	1.5	2.0	2.0	2.1	2.1	2.2	2.3
Nevada	0	0	0.3	0.3	0.3	0.3	0.3
Oak Ridge	3.5	3.5	5.0	5.4	5.4	5.4	5.4
Richland	2.5	3.7	4.2	5.3	4.6	4.6	4.6
TOTAL	12.0	15.2	19.4	22.2	21.9	21.7	21.2



	1990B	1991B	1992	1993	1994	1995	1996
Priority 1	5.9	7.0	8.9	9.5	9.5	9.6	9.6
Priority 2	4.2	5.8	7.7	8.8	9.1	8.8	8.1
Priority 3	1.9	2.4	2.8	3.9	3.3	3.4	3.5
TOTAL	12.0	15.2	19.4	22.2	21.9	21.7	21.2

* Numbers may not add up to totals due to rounding.

Figure 1.4f. The **TRANSPORTATION MANAGEMENT PROGRAM** includes many activities that support the safe and economical transport of Department of Energy materials and wastes.

1.4.1 PROGRESS IN DEVELOPING A CONSENSUS-BASED PRIORITIZATION METHODOLOGY



DOE, in consultation with interested parties, is developing a prioritization system for Environmental Restoration activities aimed at ensuring that program funding decisions reflect the primary goals of protecting public health and the environment and complying with regulatory requirements and agreements and that they are made in a technically defensible and even-handed manner.

DOE is in the process of developing a risk-based prioritization methodology to assist in the budget formulation and allocation process. This methodology will be a formal analytical decision-aiding tool addressing health and safety risks as well as social, technical, economic, and policy issues. The goals for this methodology are to support DOE budget formulation and allocation, measure the relative priority of program elements against a comprehensive set of program objectives, explicitly identify the tradeoffs between objectives, focus discussion about priorities, and provide a framework for evaluating the sensitivity of results to assumptions.

In keeping with DOE's commitment to involve interested parties in the Five-Year Plan process, this prioritization system is being developed in consultation with a wide range of outside parties, including State and Tribal governments, national environmental group representatives, the Environmental Protection Agency, and independent technical experts. DOE also plans to involve such parties during the implementation of the completed prioritization system. DOE appreciates the useful observations and advice that have been provided by these parties from the beginning of the development of the system, but recognizes that these parties do not necessarily approve, disapprove, or endorse the resulting system, for which DOE assumes full responsibility.

Responding to suggestions from outside reviewers that it would be wise to proceed slowly in developing the prioritization system, DOE has decided to follow two parallel paths--one directed toward meeting the near-term needs of the FY 1992 budget process and the other toward the long-term development of the complete prioritization system. Pending development of the final system over the course of the next year, a partial system based on the development effort thus far will be constructed and applied to the FY 1992 budget. This interim application will allow DOE to improve last year's four-tiered system and to test portions of the overall concept for the new system. Figure 1.4.1 provides an overview of this two-path approach.

Step 1: Identify Objectives for Budget Allocation. These objectives will provide the basis for establishing priorities among all DOE program elements.

Step 2: Conceptual Design Report (CDR). This report will describe a complete prioritization methodology as a focus for internal and external review.

Step 3a: Review CDR. The CDR will be reviewed by interested parties and technical advisory groups.

Step 3b: Develop and Apply an Interim Methodology. Consistent with the CDR,

this interim method will be used in developing the FY 1992 budget.

Step 3b.1: Develop Measures for Objectives. Interim scales developed to measure the performance of Environmental Restoration program elements against the objectives will probably be modified as additional data are developed for the final method.

Step 3b.2: Estimate Achievement of Objectives for Environmental Restoration Program Elements. These estimates will be based on available data and expert judgments.

Step 3b.3: Determine Relative Importance of Objectives. This step may be controversial, but value judgments are an essential part of any decision. DOE intends to make these value judgments explicit and subject to review.

Step 3b.4: Calculate Results and Conduct Sensitivity Analyses. DOE will calculate the relative value of Environmental Restoration program alternatives and conduct sensitivity analyses on key assumptions and judgments.

Step 3b.5: Provide Decision Makers with Results of Analyses.

Step 4: Evaluate CDR Reviews and Interim Application. Interested parties will have the opportunity to review the results of this interim application, consistent with requirements governing release of budget-formulation data.

Step 5: Revise the Conceptual Design and Complete Development of the Methodology. The revised method will be developed in time for a more complete application next year.

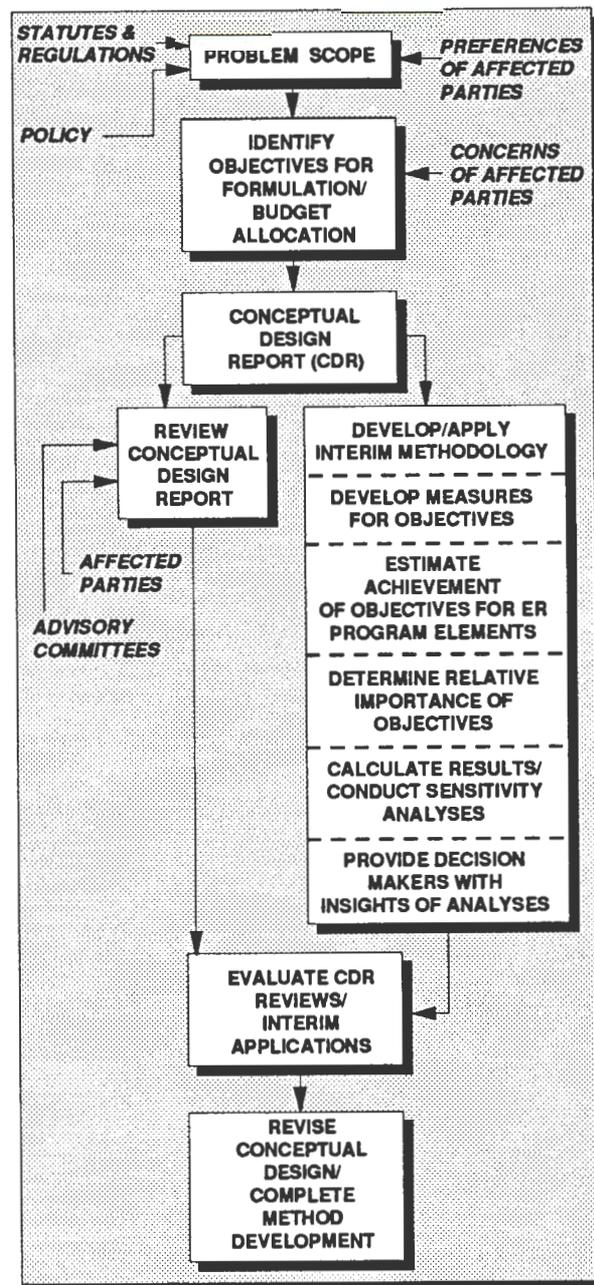


Figure 1.4.1. Steps to Environmental Restoration prioritization methodology development take two converging paths.

1.5 LONG-TERM PERSPECTIVE: DOE'S STRATEGY FOR ACHIEVING ITS 30-YEAR COMPLIANCE AND CLEANUP GOAL



DOE has set the ambitious goal of having all of its facilities cleaned up and in compliance with all applicable environmental laws and regulations by the year 2019. Achievement of this goal is contingent upon technological breakthroughs, education, cooperation of regulators, and a stable national policy.

DOE has set the ambitious goal of cleaning up all of its waste sites and bringing all of its facilities into full environmental compliance by 2019. That goal is ambitious both because of the magnitude of the effort required and because the means for attaining the goal do not now exist for all cases. DOE's strategy for reaching its goal is based on applied research and development, education, cooperation with regulators, and the promotion of a stable national policy.

DOE's environmental problems originate from activities dating as far back as the Manhattan Project of 1942-1945. Over the intervening years, practices that were considered safe and prudent have proven to be neither. Practices that have since been determined to cause environmental problems were carried out for decades. The result has been the creation of large sites requiring remediation, the full extent of which is still being evaluated.

The Office of Technology Development has instituted a program to assess the magnitude of its cleanup effort and to evaluate the potential technologies to be used. Results to date indicate that cleanup will be a long-term effort due to the cost of remediation, the number of specially trained people required, and the specialized equipment and facilities required. In addition, not all problems identified to date have satisfactory solutions available. At sites where there

is no immediate solution, DOE's strategy for compliance must focus on near-term protection and risk reduction. Sites for which no satisfactory technology exists for cleanup must be stabilized and monitored pending development of a final solution.

Providing new technologies to meet intractable problems will require close cooperation among all of the stakeholders in DOE's cleanups, including the technologists, regulators, and contractors (Section 1.7). Not only must the technologists be attuned to the research, development, demonstration, testing, and evaluation needs of the Department, but the regulators must become an active part of solving problems. By joining in a cooperative effort to bring its facilities into compliance, DOE and the regulators will have similar goals, focus on reducing risks, seek permanent solutions to problems, and avoid creating new problems in the name of demonstrating action.

Meeting its 30-year goal for cleanup and compliance also depends on maintaining a stable national policy toward DOE and its environmental problems. To promote a stable national policy, DOE must communicate its needs to the public and allow the public to provide input to its planning. Public participation initiatives have already been set in motion (Section 1.15.1), and others are planned. Compliance with the National Environmental Policy Act (NEPA) will

allow DOE additional opportunities for public participation. A major programmatic environmental impact statement (PEIS) is in progress for the Environmental Restoration and Waste Management Five-Year Plan. The NEPA process incorporates public review and comment throughout, beginning with public scoping meetings and reviews of drafts. Public hearings are included before a final PEIS is issued.

The PEIS will provide major input to Departmental planning and will serve as an umbrella document for specific projects that implement the plans. NEPA review (i.e., Environmental Assessments or EISs) will be prepared for the implementing projects and will be tiered to the PEIS.

Completion of the PEIS process could affect Five-Year Plan activities. Such changes would be reflected, as they occur, in updates of the Five-Year Plan.

The Office of Environmental Restoration and Waste Management (EM) is preparing a study for modernization of the waste management complex. The study is the first step in preparing a strategic plan for the management of EM wastes over the next 25 years.

Meeting DOE's 30-year goal for compliance and cleanup is by no means assured. Section 1.5.1 explains DOE's sense of cautious optimism related to needed technological advancements.

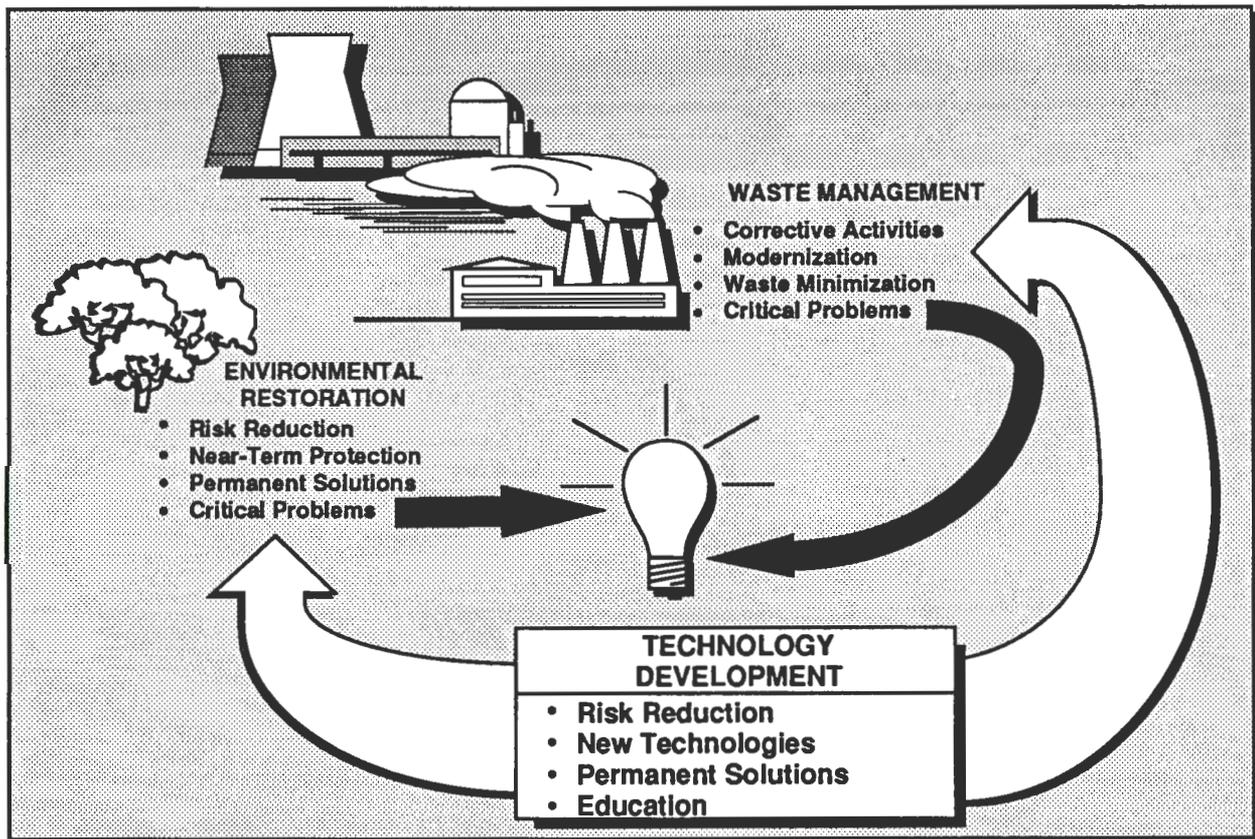


Figure 1.5. The Department of Energy's strategy for achieving its 30-year compliance and cleanup goal is strongly dependent on research and development to provide technological breakthroughs for solving critical problems.

1.5.1 ROLE OF TECHNOLOGY DEVELOPMENT IN COMPLIANCE AND CLEANUP



Collaboration among national laboratories, universities, and industry is a necessary but insufficient prerequisite for achieving technical advancements that address DOE's identified needs.

Meeting DOE's 30-year goal for compliance and cleanup is by no means assured. Although DOE stands at the forefront of a national desire to repair and maintain the environment, not all problems identified to date have satisfactory solutions. The Office of Technology Development (OTD) will strive to create refinements and advancements and will hope for the breakthroughs needed to solve DOE's environmental restoration and waste management problems. In addition, **future waste generated by DOE sites must be in a form that is acceptable to repositories.**

The DOE plan to restore and properly operate its sites should be the national testbed for environmental restoration and waste management technology development and implementation. A fully successful Technology Development Program constituting about 10 percent of the Office of Environmental Restoration and Waste Management's budget will result in DOE not only achieving its goal, but achieving it faster, more safely, and at lower cost. Even if only partially successful, technology development will provide significant benefits (Section 5.4). Technology transfer to industry, including the development of a cadre of DOE technical specialists, will support and expedite national efforts in restoration. The investment in technology development will be more than repaid by savings in operational costs. The absence of a

Technology Development Program will result in a continuation of the old practices of "suck, muck, and truck." The result will be exorbitant costs, probable delays, and unnecessary exposure of workers and the public to chemical and radiological hazards.

DOE recognizes that OTD must expect to have a high rate of failure. Technological breakthroughs cannot be planned or depended upon. Progress will instead largely be made as the result of a series of incremental advancements. **The projects that successfully pass through the test and evaluation stages will be sufficient for solving DOE's environmental problems.** Research in science and technology moves in zigs and zags rather than in a linear fashion.

Areas of DOE's Needs: Waste minimization (Section 5.3.1) has the potential for reducing cost while providing a permanent and verifiable solution to some types of waste problems. Waste management consumes a significant part of a typical DOE production facility's operating budget. With less waste being generated, greater effort can be placed on confinement to prevent the need for future environmental restoration. A combination of material substitution, increased recycling, modification of production operations, and redesign of products has the potential for reducing the volume of waste resulting from existing weapon manufacturing by 60 to

80 percent from 1985 levels within 10 years of start. Studies of transuranic and low-level waste in the Draft Research, Development, Demonstration, Testing, and Evaluation Plan (November 1989) indicated that reductions of this magnitude would save \$2.7 billion over 20 years. A review of a high-level waste minimization project at the Idaho Chemical Processing Plant indicated possible savings of up to \$1.3 billion over 20 years. Achieving such reductions throughout the DOE system generally could save DOE \$10 billion in reduced waste (Section 5.4.1) treatment, storage, and disposal costs over 20 years.

Site and waste characterization (Section 5.3.4.1) technologies can be made simpler and more efficient by the development of noninvasive remote sensors, real-time analytical tools, and improved systems for managing and interpreting data. In some cases, site contractors do not know what to do, where to do it, or when to stop. Geohydrologic systems are complex, and characterization is extremely expensive and slow. Improved risk assessment techniques must make it possible to start appropriate remediation with less complete characterization data.

Remediation technologies (Section 5.3.4.2) are available for many applications but have rarely been completely tested and evaluated for uses in specific DOE situations. Testing and evaluation of promising existing technologies for mixed wastes and contaminated sites will provide environmental restoration technologists with an arsenal of available methods with known costs and effectiveness. Without

such testing, there is no verifiable basis for establishing regulatory compliance. In some cases, the containment of existing contamination is necessary to prevent the further spread of toxic material until the means are available to implement a permanent solution. Procedures for containment range from simple emplacement of plastic sheets for preventing contact with rainwater to new exotic techniques such as freezing for immobilizing material. The application of waste minimization methods to decontamination and decommissioning and improvements in waste treatment, storage, and disposal are also needed.

Education (Section 5.7) of technically trained personnel for the design, conduct, and management of environmental restoration and waste management activities is essential to the completion of DOE's 30-year plan for site cleanup. The shortage of trained personnel leads to bidding wars and increased costs among industry, consulting firms, and the government for qualified staff and managers. Programs are handicapped because the few technically trained managers are overcommitted. These problems are likely to increase in the future without an education program in waste management-related technology. DOE will find itself unable to compete in the marketplace for experienced managers and technologists and will be forced to rely on recent graduates and accept high turnover among more experienced personnel. The cleanup program will inevitably face higher costs because of inefficiencies and will probably miss milestones.

1.6 NEW DOE ORGANIZATION FOR ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT



DOE has established a new Office of Environmental Restoration and Waste Management (EM) to consolidate Department-wide responsibility and to give it the attention of top-level management.

The FY 1991-1995 Environmental Restoration and Waste Management Five-Year Plan identified a need for a new organizational structure to meet the stated goal of full compliance and cleanup within 30 years. Formerly, responsibility was diffused among the major programmatic organizations: the Assistant Secretary for Defense Programs, the Assistant Secretary for Nuclear Energy, and the Director of the Office of Energy Research. The Plan called for the establishment of a new office under a senior manager that would consolidate responsibility for waste management and environmental restoration, provide for greater accountability, separate environmental budgets from potential competition with programmatic or production budgets, and give environmental restoration and waste management visibility at the highest levels of management within the Department.

The new organizational structure has now been established. The new organization needs a management system tailored to its requirements. To meet this need, an integrated planning, budget, and control system is being developed. The management system will (1) be responsive to the structure and different duties of each element of the new organization; (2) be simple and flexible; (3) use existing management systems where appropriate but eliminate duplication among existing planning, budget, and control systems; and (4) support reporting and accountability.

EM is the new organization that has been established. This new Office integrates management, budgets, and technologies for Department-wide waste management and cleanup. It comprises three programmatic offices and two crosscut and support-offices, all managed by Associate Directors. The Office of Waste Operations has program responsibilities for waste management at all DOE sites. Waste management includes the treatment, storage, and disposal of several types of waste: high-level radioactive wastes; transuranic wastes, including the Waste Isolation Pilot Plant; low-level radioactive wastes; chemically hazardous wastes; mixed wastes; and solid sanitary wastes. Waste minimization efforts are contained within this Office, as are Corrective Activities at waste management facilities.

The Office of Environmental Restoration has program responsibilities for cleanup of inactive hazardous and radioactive waste sites at all DOE installations and some non-DOE sites for which DOE has responsibility. Excluded are sites under the authority of the power marketing administrations, the Office of Naval Reactors, and the Office of Fossil Energy. Included are remedial actions and decontamination and decommissioning (D&D). Remedial actions are primarily concerned with all aspects of the assessment and cleanup of inactive potential release sites. D&D is primarily concerned with the safe caretaking of

surplus nuclear facilities until either their decontamination for reuse or their complete removal.

The Office of Technology Development has program responsibilities for providing new and more effective technologies for meeting DOE's 30-year goal for compliance and cleanup. Included are research and development of new technologies; demonstration, testing, and evaluation of technologies developed elsewhere; transportation; and educational programs to produce the scientists and engineers needed to maintain the momentum of Research, Development,

Demonstration, Testing, and Evaluation until the job is complete. The Office of Planning and Resource Management supports the program offices in budget preparation and accounting and has the responsibility for coordinating the annual update of the Five-Year Plan.

The Office of Quality Assurance and Quality Control performs independent internal oversight to ensure compliance with environmental and safety laws and regulations and to enhance the technical validity and cost effectiveness of programs and projects.

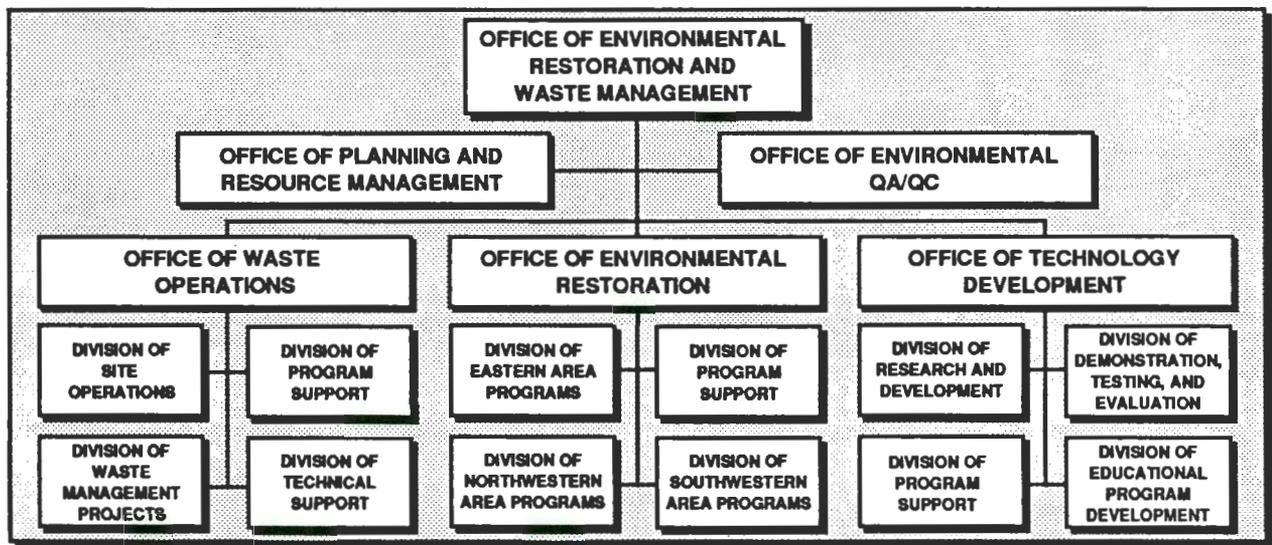


Figure 1.6. The Department of Energy has established the Office of Environmental Restoration and Waste Management to provide integrated management to waste operations and cleanups and their associated technology development requirements. (QA = Quality Assurance, QC = Quality Control)

1.6.1 INCREASED INDEPENDENT ACCOUNTABILITY THROUGH THE OFFICE OF QUALITY ASSURANCE AND QUALITY CONTROL



The Office of Quality Assurance and Quality Control (QA/QC) within the Office of Environmental Restoration and Waste Management (EM) performs independent internal oversight to ensure compliance with environmental and safety laws and regulations and to enhance the technical validity and cost effectiveness of programs and projects.

The creation of the Office of QA/QC and the development of its role and functions are in response to Secretary of Energy Notices 6A and 13 and Secretarial initiatives for enhanced responsibility of line management for the protection of public health and the environment.

EM Program goals are to bring DOE facilities into compliance with the letter and spirit of applicable laws, maintain such compliance, manage DOE wastes in accordance with applicable laws, protect human health and safety and the environment, and complete cleanup activities at DOE facilities by the year 2019. It is critical that EM projects comply with environmental and safety regulations and that the engineered solutions be technically valid and cost effective. The development and implementation of a QA/QC Program is the key to achieving that program goal.

The Office of QA/QC will oversee and assist EM's fulfillment of its line management responsibilities to achieve environmental protection, worker safety, and public health protection at its facilities and projects. A foundation of this Office's activities is the development and implementation of an EM QA Program based on DOE Orders, Environmental Protection Agency (EPA) requirements, national standards, and EM Program needs. The Office will review

and oversee onsite activities of the installation contractors as well as EM Programs carried out by Area Offices and Operations Offices. The Operations Offices are in the process of realigning their organizations to most effectively implement the Five-Year Plan. A Memorandum of Agreement has been signed between EM and other DOE Program Offices to identify those facilities that will come under EM purview. It is primarily these facilities that will be the subject of the EM QA/QC overview.

The Assistant Secretary for Environment, Safety and Health (EH) is responsible for global oversight of DOE activities to ensure compliance with environmental protection, worker safety, and radiation safety requirements and to review and assess epidemiological and radiological protection issues related to public health and radiological protection. The EH role is one of setting DOE policy and ensuring compliance consistency and effectiveness by DOE line management. EH will, in effect, review and oversee EM environmental safety and health compliance programs and ensure they are within the DOE policy and guidance framework. This EH global function focuses primarily on DOE Program Offices, Operations Offices, and Area Offices. The direct review of installation contractors and their work is a line management responsibility carried out for

EM Programs via the Office of QA/QC. One function of EM QA/QC with no counterpart in EH is reviewing engineering design and evaluating cost effectiveness. This function will include risk assessment work and will look at a representative sample of EM projects to ensure they are designed and costed to achieve the maximum public health and environmental protection benefits possible.

The Office of QA/QC includes the Nuclear Self-Assessment capability required in SEN-6A-89. This Office function involves reporting directly to the EM Director on results of independent nuclear safety design, construction, and operational evaluations of EM nonreactor

nuclear facilities. Activities include the review of a sample of EM Safety Analysis Reports, technical specifications, and operational safety requirements, as well as the assessment of the effectiveness of Technical Safety Appraisals, conduct of independent Unusual Occurrence investigations, and performance of other onsite evaluations as stipulated by the EM Director.

The competition for Federal funds is fierce. The Nation demands real, measurable environmental and public health benefits from EM Programs and projects. The primary function of the Office of QA/QC is to formally and systematically ensure those benefits.

1.7 INTEGRATING ENVIRONMENTAL RESTORATION AND WASTE OPERATIONS WITH TECHNOLOGY DEVELOPMENT



The Office of Technology Development (OTD) supports the research, development, demonstration, testing, and evaluation (RDDT&E) needs of the Office of Environmental Restoration and Waste Management (EM) through close programmatic integration at all stages.

Integration at the Project Level: The need for a close relationship between OTD and the sites is created by the regulatory drivers of environmental restoration and waste operations, discovery of new problems, and technological developments made outside of DOE. DOE has entered into various kinds of agreements for cleanup and compliance, including schedules. To maintain progress toward meeting schedules, DOE will be forced to use costly and less efficient existing technologies unless OTD can deliver innovative approaches without delaying the project. Only an integrated team approach to projects can provide needed confidence among all parties with minimal impact on schedules.

For an environmental restoration project, the integration team would include, at a minimum, the DOE program manager responsible for the site, the responsible DOE field manager and operating contractor manager, the OTD manager responsible for the technology area being researched, the OTD research contractor, a representative of the workers, and regulators. The integration team's role is to help select technologies to use, identify where RDDT&E can help meet project goals, monitor the progress of the supporting RDDT&E, and propose changes in the scope of the compliance or RDDT&E project.

Technology development thus becomes part of the solution to the problem and of

the compliance project itself. Needs can be communicated directly if they change, and progress toward solutions can be monitored not only by the site manager but also by the regulators. Done well, the project becomes driven by goals instead of schedules. Such an integrated approach to cleanup and compliance projects also facilitates the transfer of technology among potential users.

This integrative approach must be tailored to individual compliance and cleanup projects. The Department of Health Services of the State of California has proposed a pilot implementation for remediation work in that State and has received encouragement from DOE's San Francisco Operations Office. A similar approach is being followed by the Oak Ridge Operations Office in cooperation with the State of Tennessee and the Environmental Protection Agency (EPA) Region IV.

Integration of Environmental Restoration and Waste Operations Activities Using "Roadmaps": To support management of its programs, EM will use "roadmaps" to fully describe its work, identify key interfaces, provide a baseline from which to measure progress, and highlight problems needing new technologies.

A "roadmap" is a logically ordered list of functions and activities required to complete a DOE environmental restoration or waste management mission.

These logic diagrams show the "destination," such as the operation of a treatment facility or the containment of a particular contamination plume; the "route" to be followed (including interactions with routes leading to other destinations); and the "distance" or time to reach each destination (with interim and final technical and regulatory milestones). Eventually, several nested roadmaps will be prepared for each mission or part of a mission, with an increasing level of detail. Roadmaps will be integrated both within each mission and across the different missions being pursued at each site. Roadmaps from all DOE sites will be integrated to identify the interactions among the complete set of environmental restoration and waste management missions and also the interactions with all other DOE Offices, such as the Office of Defense Programs.

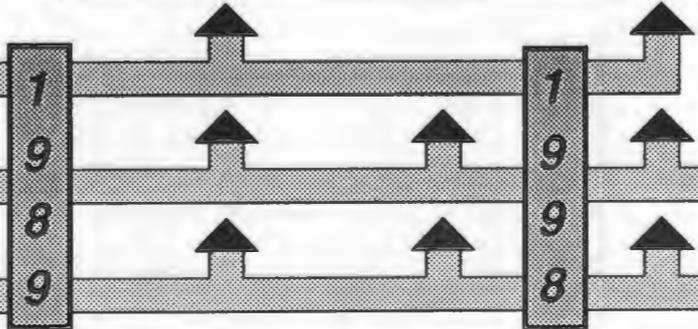
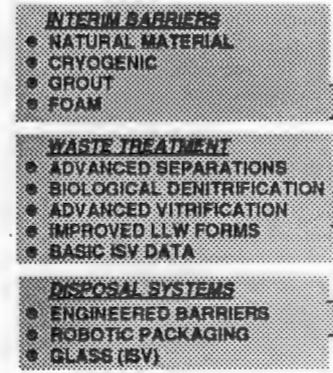
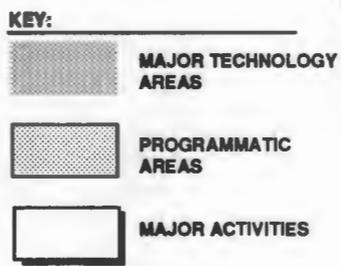
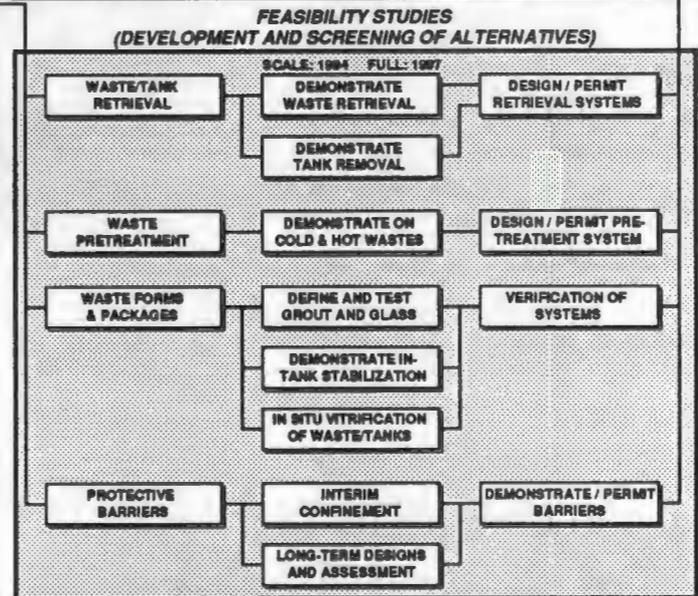
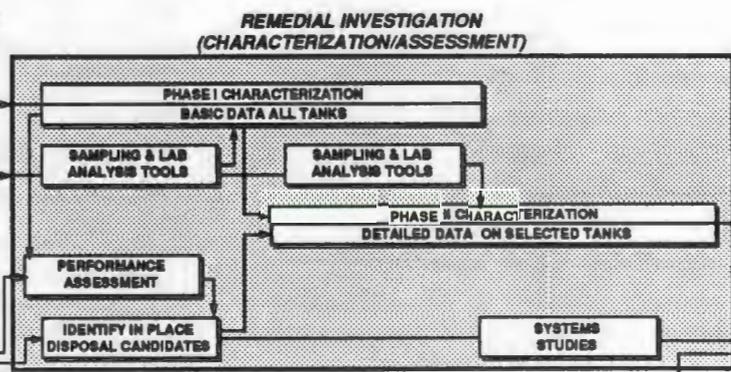
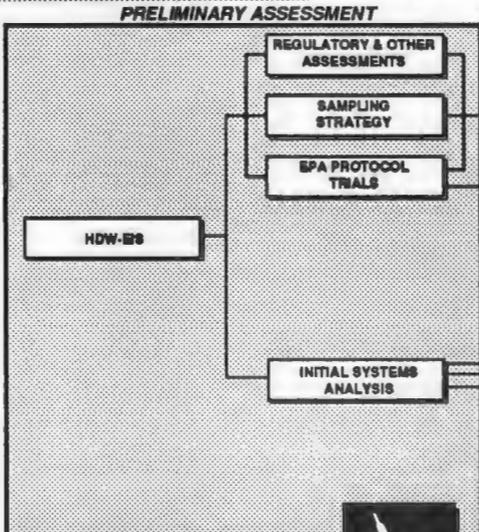
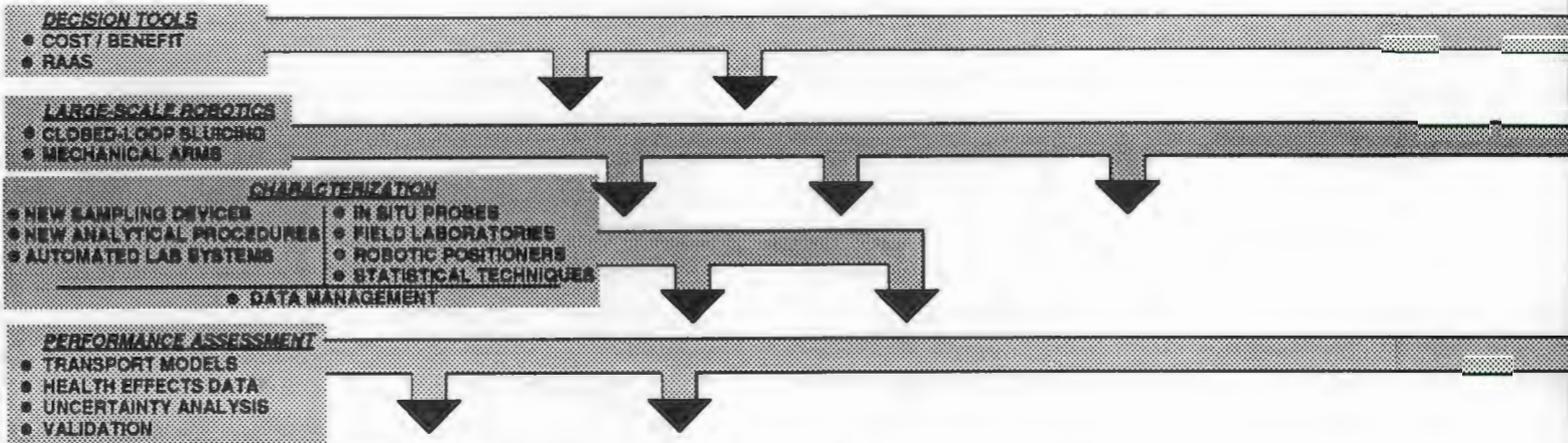
The integrated roadmap (a series of logic diagrams, descriptive text, and a detailed data base) will be one of several tools used by Headquarters managers to maintain a comprehensive knowledge of the EM Program. As a visual representation of the program baseline, it will be an excellent internal and external tool for communicating both intentions and results. Roadmaps will be fully integrated with other planning documents and will be annually updated. Figure 1.7 shows the top-level roadmap for the Hanford mission on single-shell tanks.

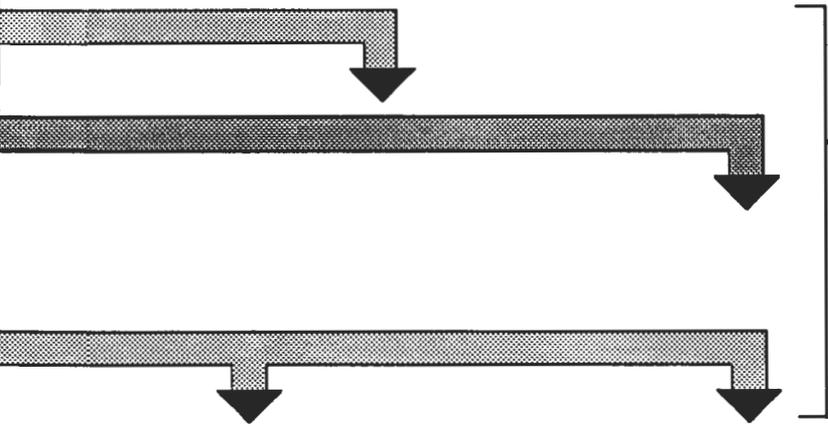
Two different types of roadmaps are being developed: operational roadmaps and

technology roadmaps. Operational roadmaps are descriptions of all the operations required to complete missions--both specific projects, such as the design of the Hanford Waste Vitrification Facility, and those that reach across several projects or sites. The level of detail required to prepare a comprehensive roadmap forces the identification of problems needing technology: those areas where the "route" between functions or the technology for performing a function is unidentified, unclear, unusually expensive, or unavailable.

The identified EM technology needs are the basis for technology roadmaps. Technology roadmaps will describe, in logical order, how the identified technology needs or requirements, such as the development of a nondestructive method for characterizing buried low-level waste, will be met. As with the operational roadmaps, different levels of logic diagrams will be nested to provide increased levels of detail. Technology roadmaps will be prepared by OTD jointly with EM staff.

A combined Headquarters and field contractor team began work on a top-level operational roadmap for the Rocky Flats Plant in April 1990. As the top-level diagrams are reviewed and approved, sites will move on to lower-level diagrams with increased accuracy and detail.





GENERAL TECHNOLOGY DELIVERABLES

- EARLY - BASIC CONCEPTS AND DATA
- MID TERM - PILOT DEMONSTRATION AND FEASIBILITY
- LONG TERM - FINAL VALIDATION DATA

NOTE:



Application of science and engineering to conceive technology advancements, develop and test the technologies, and demonstrate the technology effectiveness under actual conditions



Remedial actions required at all inactive/surplus facilities and sites contaminated with radioactive, hazardous, or mixed wastes.

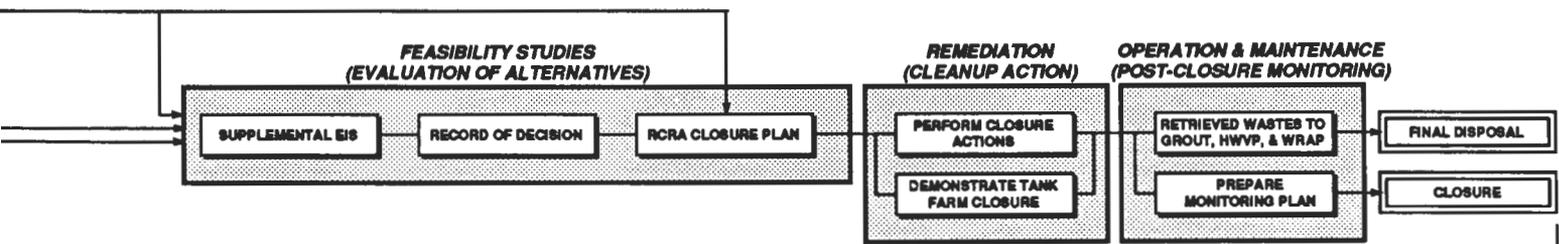
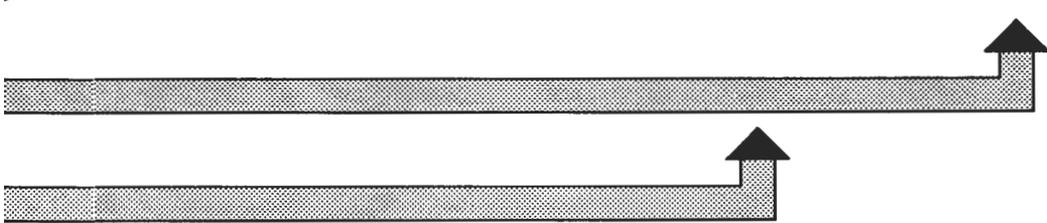


Figure 1.7. This top-level roadmap for the Hanford mission on Single-Shell Tanks does not show interfaces with other Hanford missions. It therefore simplifies the complex planning, budgeting, and decision making required to have technologies available at the proper time to meet compliance requirements. (See Section 5.1 for a discussion of this issue.)



SIMPLIFIED OPERATIONAL ROAD MAP FOR HANFORD SINGLE-SHELL TANKS



2018

1.8 RELATION OF FIVE-YEAR PLAN TO THE FEDERAL BUDGET PROCESS AND SITE-SPECIFIC PLANNING PROCESS



This FY 1992-1996 Five-Year Plan merges the Department's regular budget process and the site-specific planning process with its new five-year planning process.

The Five-Year Plan is the formal planning basis for regulatory compliance, waste management, environmental cleanup, and technology development activities connected with the Department's nuclear facilities and sites. The FY 1991-1995 Five-Year Plan was prepared between April and August of 1989 at the special request of the Secretary and was incorporated into the budget process before its submittal to the Office of Management and Budget (OMB) in September. The request and projections in that Plan reflected the activity and cost data already prepared and validated for the FY 1991 budget. This FY 1992-1996 Plan merges the budget and five-year planning processes.

Figure 1.8a shows how the Plan is developed and leads into the budget process. In November the Department's Operations Offices are requested to prepare for Headquarters the Fiscal Year plus two (FY+2) through FY+6 Activity Data Sheets (ADSs), the fundamental building blocks from which both the Five-Year Plan and the budget are developed. The ADSs show activities with appropriate information on such items as funding and priority levels, regulatory drivers, National Environmental Policy Act documentation, budget and reporting codes, and a narrative description of the activity.

As appropriate, the ADSs and the Environmental Pollution Abatement Plan (also called A-106 Plans) required by

Executive Order 12088 will be cross-referenced and consistent.

DOE Headquarters conducts a review of each submitted ADS to ensure that the information can be supported. The ADSs are also reviewed for consistency with programmatic missions and are used to develop the FY+2 plan. When the plan is issued, funding levels are consistent with those found in the FY and FY+1 budget documents and thus serve as a framework for the FY+2 Office of Environmental Restoration and Waste Management (EM) Program Budget Request.

The EM Program Budget Request is entered into the Department's Internal Review Budget process, where it is compared with other programs' requests within the Department and becomes a segment of the Department's request to OMB in September. (For FY 1992 this process will provide more precise estimates of validated costs. In this regard, see Section 1.2.) OMB prepares the total DOE request to the Congress in January for authorization and appropriation. Once authorization and appropriation actions are complete (usually in October), execution of the budget begins.

The Federal budget process is long; at least two years elapse between the identification of activities by DOE Operations Offices and the appropriation of funds. This length of time between

budget formulation and execution highlights the need for some flexibility in the budget process. The Site-Specific Plans (SSPs) discussed in Section 1.10 are also derived from the ADSs and the Five-Year Plan and serve as implementation plans for the fiscal year in which they are issued. Normally the Department's Operations Offices will prepare a draft FY+1 SSP based on activities and funding in the FY+2 Five-Year Plan. The final FY+1 SSP is published in November after the fiscal year begins and the congressional authorization and appropriation process is complete. This SSP includes minor revisions made to the ADSs to reflect budget actions by the Department, the OMB, and the Congress. These relationships are presented in Figure 1.8a.

Summary of Differences Among the FY 1991-1995 Five-Year Plan, the Budget, and the Site-Specific Plan: Discrepancies exist between funding shown in the Five-Year Plan versus that shown in the FY 1991 Congressional Budget Submission. The Five-Year Plan contained funding for Priority 4 activities and for Technology Development activities already under way within the Environmental Restoration and Waste Operations Programs. The FY 1991 President's budget funded Priorities 1, 2, and 3, and the Technology Development activities were augmented to support new activities.

The initial SSPs were prepared on an accelerated schedule and in a rapidly changing external and internal environment. This situation caused

discrepancies between Operations Office funding shown in the Five-Year Plan and the budget submission, as well as between various versions of the SSP. Earlier estimates shown in the SSPs are being revised to reflect new information. As discussed in Section 1.9, unanticipated spikes in funding requirements will cause such estimates to change. Tiger Team investigations and new regulatory agreements resulted in a need for increased funding. These increases are reflected in the initial SSPs but occurred after publication of the FY 1991-1995 Five-Year Plan.

Because of this dynamic environment, the initial SSPs contain much data that are reflected in this FY 1992-1996 Five-Year Plan; their final publication will occur in November 1990. At that time, the SSPs will address comments received from the public review period, incorporate the final FY 1991 appropriations, and serve as the implementation plan for FY 1991. As a consequence, publication of an update of the initial SSPs will not occur until November 1991. Thereafter, updates will be published annually.

The Five-Year Plan is expected to ultimately merge the budget process with the planning process. As indicated by Figure 1.8b, the SSPs will evolve from the Five-Year Plan and will reflect the appropriation for the fiscal year in which they are issued. Preparation of the following Five-Year Plan will begin at approximately the time the SSP is published. Funding differences among the Five-Year Plan, the budget, and the SSPs should decrease but will not disappear.

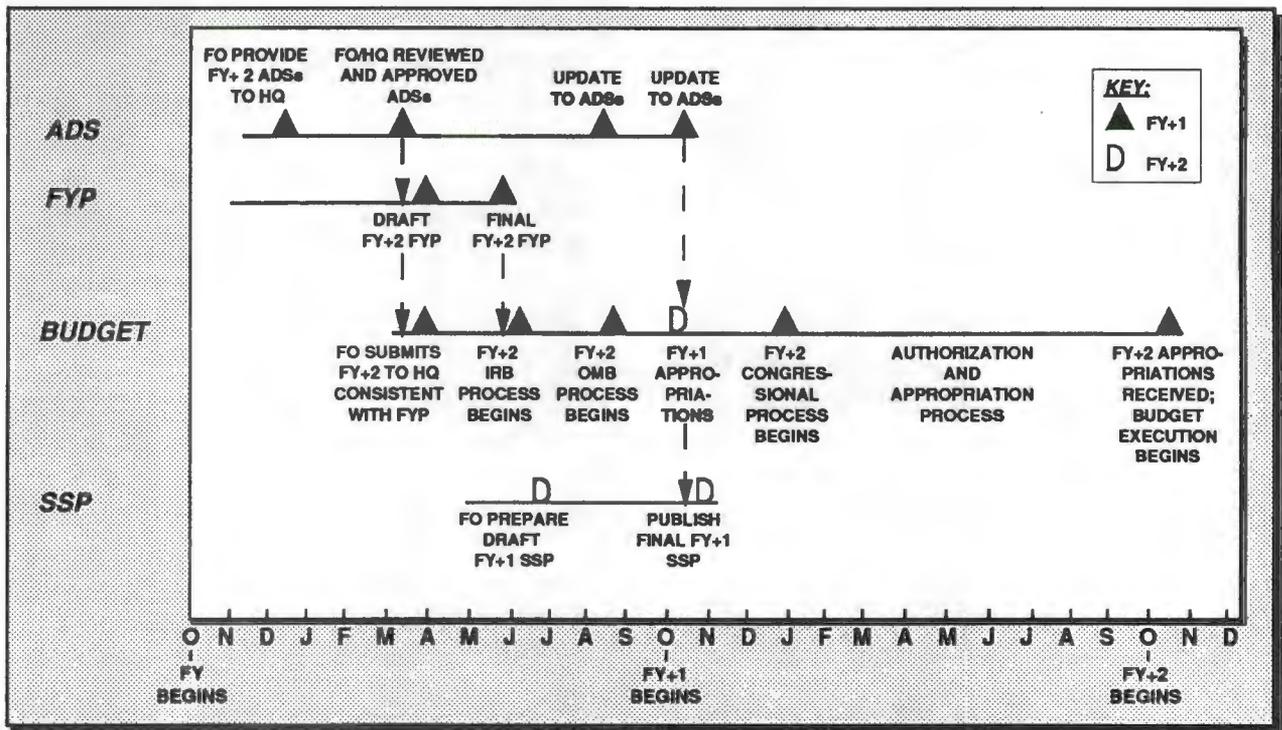


Figure 1.8a. The Five-Year Plan data feed into the Department's Federal budget process. (ADS = Activity Data Sheets, DOE = Department of Energy, FO = Field Office, FY = Fiscal Year, FYP = Five-Year Plan, HQ = Headquarters, IRB = Internal Review Budget, OMB = Office of Management and Budget, SSP = Site-Specific Plan)

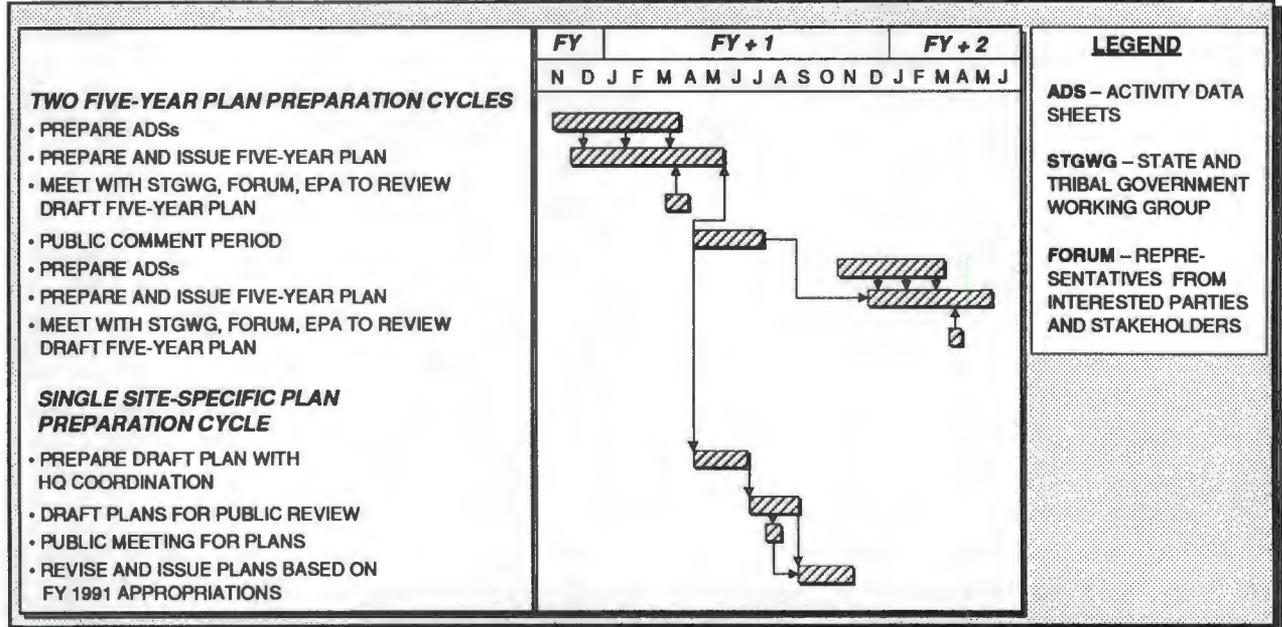


Figure 1.8b. An alternative portrayal of typical Five-Year Plan and Site-Specific Plan activities showing activities related to public participation. (ADS = Activity Data Sheets, EPA = Environmental Protection Agency, FORUM = Representatives from interested parties and stakeholders, HQ = Headquarters, STGWG = State and Tribal Government Working Group)

This page intentionally left blank.

1.9 NEED FOR FLEXIBILITY TO ENSURE SUCCESSFUL PLAN IMPLEMENTATION



Five-Year Plan implementation will fail in achieving mandated compliance without a funding strategy capable of responding to sudden spikes arising from a likely underestimation of Plan requirements.

Funding for Corrective Activities, Environmental Restoration, and Waste Operations places unprecedented demands on budget processes. If a contractor requests funding for compliance but DOE cannot provide the funds required to meet the schedule and avoid civil/criminal liabilities and fines, can the contractor be held liable? The answer depends on the fate of a draft rule (Federal Register, January 26, 1990), which proposes that the contractor not be held responsible.

The high level of uncertainty in predicting DOE's environmental compliance mortgage results from the nature and state of maturity of the program. DOE is in the early investigative phase of more than 75 percent of Environmental Restoration activities and will continue to devote a significant portion of its Environmental Restoration budget to characterization throughout the planning period. Cost predictions for the Environmental Restoration remediation phase are, therefore, very tentative and subject to significant change. In Waste Operations and Corrective Activities, strict investigations of operational practices by DOE Tiger Teams and regulators yield sudden needs for unplanned funding. Given the low level of confidence in cost estimates at these early phases, and considering the need to meet compliance agreements in force between DOE and the States, it is imperative to find a pragmatic budget strategy. This strategy should ensure necessary funding for

program continuity and full compliance with legal requirements.

Background/Discussion: Individual actions driven by regulations, especially Environmental Restoration remedial actions, often are carried out over two or more years in accordance with agreed-upon milestones and completion dates. Most are done under enforceable agreements. Not meeting the terms of these agreements because of budgetary processes or other constraints undermines DOE's goal of environmental compliance.

The Federal budget system itself is not designed for, nor does it easily accommodate, long-term efforts with short-term uncertainties. Reprogramming funds from one activity to another is an option; however, it requires significant time. Many Five-Year Plan activities, especially in Environmental Restoration, are not projects (activities with clear specifications for completion); they are problems, about which DOE does not know at the start what completion will mean (technically or in terms of regulations) and often does not even know the full extent and nature of the environmental insult.

These activities are driven by external forces and events, which are not necessarily timed to coincide with established Federal budget cycles. The accuracy of estimates improves as the activities move from the investigative

phase to the actual remediation phase (i.e., similar to conventional construction), but even during remediation, the scope of the task can change dramatically as new areas of contamination are defined. Thus, the current multiyear planning process may be incapable of reacting swiftly enough to provide the resources needed to maintain compliance schedules. At any point, discoveries may cause unanticipated spikes in funding requirements.

Estimating requirements for the Five-Year Plan must, therefore, establish adequate levels of funding, provide flexibility to accommodate unexpected results of ongoing activities and demands from regulators, and assure the public that DOE is being responsive to the public's concerns and is conducting its business in a cost-effective manner. The current system lacks such flexibility.

DOE Action: DOE must have the ability to respond to unforeseen demands for funding that are extremely likely to occur during the investigative stages of compliance and cleanup activities. DOE will continue to discuss options, such as a Near-Term Response Fund, to ensure that DOE is able to respond quickly as new assessments identify high-priority needs or as new regulatory requirements arise.

Because the Federal government must eventually pay whatever it costs to clean up its properties and facilities, this approach would not increase costs; and, by having funds available when needed, it should actually reduce costs by avoiding work interruptions.



The Site-Specific Plans (SSPs) provide the vehicle for participation by affected parties at the regional/local level. Also, they will be used by the Operations Offices and DOE Headquarters to measure progress in meeting DOE's goal for environmental cleanup, waste operations, and technology development activities.

Based on the Five-Year Plan, each Operations Office will produce annual detailed SSPs that summarize the Corrective Activities, Environmental Restoration, Waste Operations, and Technology Development activities being conducted by that Office. The initial SSPs were prepared during the fall and winter of 1989, immediately following submission of the FY 1991-1995 Five-Year Plan to the Congress. Given the relatively short period for the production of the first draft SSPs, participation in the planning activities was limited to involved regulatory bodies and established community groups. Although non-DOE involvement was limited, the general conclusion is that this process was mutually beneficial to the Department and the communities.

The Department intends to expand the opportunity for public participation in the SSP process. Expanded participation is possible because this and subsequent Five-Year Plans will be issued in June instead of August. Therefore, there will be more than sufficient time for regulator and public review of the draft SSPs before publication of the final plans in the fall. Figures 1.8a and 1.8b in Section 1.8 show typical schedules for preparation, review, and publication of the Five-Year and Site-Specific Plans.

The plans, activities, milestones, and associated schedules provided in the SSPs can be used by the communities and regulators to monitor the Department's progress. This information will also be used by the Operations Offices and DOE Headquarters for managing and monitoring. The SSPs are based on the information in the Activity Data Sheets, which provide a basis against which technical performance, cost, and schedule will be measured. Emphasis will be given to congressionally funded activities projected for completion in the fiscal year the Plan is issued. For example, the initial SSPs, to be issued as final in the fall of 1990, will emphasize FY 1991 activities. The update to these initial SSPs will be issued as final in the fall of 1991 and emphasize FY 1992 activities.

Based on interactions with Federal and State regulators and the communities during the preparation of the first SSPs, as well as experience in using them, the Department is revising the outline to make the Plans more "user friendly," thus facilitating communications with and participation by the communities. Figure 1.10 shows the proposed outline for the SSPs to be issued in the fall of 1991.

Draft Site-Specific Plan Outline

Foreword

1.0 Executive Summary

- 1.1 PURPOSE AND SCOPE OF THE SITE-SPECIFIC PLAN AND RELATIONSHIP TO FIVE-YEAR PLAN
- 1.2 DESCRIPTION AND MISSIONS OF INSTALLATION
- 1.3 ORGANIZATION FOR ENVIRONMENTAL RESTORATION, WASTE MANAGEMENT, AND TECHNOLOGY DEVELOPMENT (Includes Transportation, if applicable)
- 1.4 STRATEGIC APPROACH FOR ENVIRONMENTAL RESTORATION, WASTE MANAGEMENT, AND TECHNOLOGY DEVELOPMENT
- 1.5 PROCESS FOR COMMENT DISPOSITION AND RESPONSE TO COMMENTS ON LAST YEAR'S PLANS
- 1.6 SUMMARY STATUS OF COMMITMENTS MADE IN LAST YEAR'S PLAN
- 1.7 SUMMARY OF CHANGES FROM LAST YEAR'S PLAN (OPTIONAL)
(Includes summary of key regulatory issues of the previous year)
- 1.8 FUNDING PRIORITIZATION BY CATEGORY
- 1.9 PUBLIC PARTICIPATION PLAN

2.0 Corrective Activities

- 2.1 OVERVIEW OF THE CORRECTIVE ACTIVITIES PROGRAM
- 2.2 PROCESS FOR MANAGING AND IMPLEMENTING THE CORRECTIVE ACTIVITIES PROGRAM
- 2.3 CORRECTIVE ACTIVITIES PROGRAM ACTIVITY AND FUNDING SUMMARY FOR FY 1992-1997 (Two-page tables from the Five-Year Plan)
 - 2.3.1 AIR CORRECTIVE ACTIVITIES
 - 2.3.2 WATER CORRECTIVE ACTIVITIES
 - 2.3.3 SOLID WASTE CORRECTIVE ACTIVITIES

3.0 Environmental Restoration

- 3.1 OVERVIEW OF THE ENVIRONMENTAL RESTORATION PROGRAM
- 3.2 PROCESS FOR MANAGING AND IMPLEMENTING THE ENVIRONMENTAL RESTORATION PROGRAM
- 3.3 ENVIRONMENTAL RESTORATION PROGRAM ACTIVITY AND FUNDING SUMMARY, FY 1992-1997
(Two-pager tables from the Five-Year Plan)
 - 3.3.1 Environmental Restoration—Onsite
 - 3.3.2 Environmental Restoration—Offsite
 - 3.3.3 Environmental Restoration—Decontamination and Decommissioning

4.0 Waste Operations

- 4.1 OVERVIEW OF THE WASTE OPERATIONS PROGRAM
- 4.2 PROCESS FOR MANAGING AND IMPLEMENTING THE WASTE OPERATIONS PROGRAM
- 4.3 WASTE OPERATIONS PROGRAM ACTIVITY AND FUNDING SUMMARY FOR FY 1992-1997
 - 4.3.1 Waste Operations—High-Level Waste Program
 - 4.3.2 Waste Operations—Transuranic Waste Program
 - 4.3.3 Waste Operations—Low-Level Waste Program
 - 4.3.4 Waste Operations—Mixed Waste Program
 - 4.3.5 Waste Operations—Solid (including Hazardous) Waste Program

5.0 Technology Development

- 5.1 OVERVIEW OF THE TECHNOLOGY DEVELOPMENT PROGRAM AND TECHNOLOGY NEEDS
- 5.2 PROCESS FOR MANAGING AND IMPLEMENTING THE TECHNOLOGY DEVELOPMENT PROGRAM
- 5.3 EXPECTED BENEFITS FROM NEW INITIATIVES IN TECHNOLOGY DEVELOPMENT
- 5.4 SUMMARY OF PLANNED TECHNOLOGY DEVELOPMENT ACTIVITIES, FUNDING, AND MILESTONES, FY 1992-1997

6.0 Transportation (as applicable)

- 6.1 OVERVIEW OF TRANSPORTATION PROGRAM
- 6.2 SCOPE OF DOE WASTE TRANSPORTATION OPERATIONS
- 6.3 SCOPE OF TRANSPORTATION TECHNOLOGY DEVELOPMENT
- 6.4 SCOPE OF TRANSPORTATION OUTREACH ACTIVITIES

Figure 1.10. The proposed outline for the Site-Specific Plans to be issued in November, 1991 includes six major topics: Executive Summary, Corrective Activities, Environmental Restoration, Waste Operations, Technology Development, and Transportation.



A systematic Five-Year Plan process is being developed and implemented.

The Environmental Restoration and Waste Management Five-Year Plan will be updated annually. Based on the lessons learned from the FY 1991-1995 and the FY 1992-1996 Five-Year Plans and from the review and participation of stakeholders, a systematic process for the annual update is being developed.

The success of future five-year planning depends on several key factors. First, to be a means of measuring progress toward compliance and a dynamic planning tool supporting the Department's 30-year goal, the Plan must be systematically and routinely produced with accurate and timely information. Progress will continue to be portrayed in the "Status" boxes of Operations Office and installation activity summaries in the Plan's Attachment sections, as well as in an Appendix like this FY 1992-1996 Plan's Appendix B, "Status of Commitments Made in the FY 1991-1995 Five-Year Plan." DOE is also exploring other vehicles for tracking and portraying progress. Second, Activity Data Sheets (ADSs) will be the primary instrument for ensuring accurate and timely information. Third, the Plan must be a directive document for annual site-specific implementation plans prepared by the Department's Operations Offices. Fourth, the continued participation of involved States, affected Indian Nations, national associations, other Federal agencies, and the public is critical to the process of developing each annual Plan.

Systematic and Routine Planning: The Office of Environmental Restoration and Waste Management's (EM's) Office of Planning and Resource Management will be responsible for producing the annual Five-Year Plan with support from all other EM line programs. Five-year planning is a year-round job. To meet these two requirements, in FY 1990 the Office of Planning and Resource Management will assign a full-time manager to coordinate the Five-Year Plan efforts of designated Environmental Restoration, Waste Operations, and Technology Development staff. By FY 1991 each of these program offices will dedicate staff to the full-time task of supporting Headquarters and field planning, budgeting, and monitoring activities. The assignment of Operations Office personnel to Headquarters for five-year planning activities will be kept to a minimum so their attention can be focused primarily on significant field activities.

To the maximum extent possible, the Five-Year Plan process will fit and direct Departmental program and project planning, budgeting, and reporting processes. An integrated process must ensure efficient use of management resources and information integrity.

Activity Data Sheets: ADSs are the central management element for all EM planning and budget processes. During

FY 1990, the critical support function provided by the ADSs will be enhanced and automated to provide rapid, routine access to quality information. Specifically, the ADSs will be formally updated by the field with final budget information to ensure that budget and milestone information is consistent and supportive of routine preparation of next year's Five-Year Plan.

EM will manage the ADSs and other program management information such as cost, schedule, and milestone information as an EM-wide corporate data base. Other technical information relating to release sites and waste management activities will be defined and will reside on the Waste Information Network (WIN). WIN is a telecommunications network that connects the Operations Offices as well as all other DOE installations. EM is using WIN as an internal management information system. It is operated by Martin Marietta Energy Systems, Inc., Oak Ridge, Tennessee, under contract to the Department of Energy, Oak Ridge Operations Office.

Link with Site-Specific Plans: The Five-Year Plan precedes and directs

preparation of site-specific implementation plans by the Department's field offices. The site-specific plans are linked to the Five-Year Plan to ensure consistency in planning information and assumptions. This linkage is provided in two ways.

Both the site-specific plans and the Five-Year Plan are based on ADSs. The two-page Operations Office and installation summaries, prepared for each compliance-related area for the Five-Year Plan, will be repeated and also receive more detailed treatment in the SSPs.

Stakeholder Involvement: The Department is committed to the continued involvement of all interested groups and individual stakeholders in the review and comment of Five-Year and site-specific plans. The participation of affected States, Indian Nations, and governmental associations will be further encouraged and formalized in FY 1990. The formal involvement of environmental interest groups and the public is also planned. Review and comment by the National Academy of Sciences on DOE programs will be encouraged.

1.12 SUMMARY STATUS OF COMMITMENTS MADE IN LAST YEAR'S PLANS



DOE identified many needs in the FY 1991-1995 Five-Year Plan and in the Draft Research, Development, Demonstration, Testing, and Evaluation (RDDT&E) Plan and committed to over 200 actions to resolve them. DOE has made significant progress toward accomplishing its commitments.

The environmental problems accumulated over a period of more than four decades at DOE facilities will require a significant period of time to rectify. DOE has undertaken an ambitious goal of achieving full compliance and cleanup by the year 2019. The annual Environmental Restoration and Waste Management Five-Year Plan establishes a strategy for meeting that goal and sets milestones by which progress may be measured.

The commitments made in the FY 1991-1995 Five-Year Plan are divided into five categories: Policy Commitments, Corrective Activities, Environmental Restoration Waste Operations and Technology Development. Representative major commitments are summarized here, with a complete listing of near-term commitments and status included in Appendix B.

Policy: Major policy commitments made last year included changing DOE's culture from production-oriented secrecy to environmentally-oriented open communication. Various measures indicate that progress is being made (Sections 1.14-1.16), but much remains to be accomplished. Tangible results can be seen in the new organization for environmental restoration and waste management (Section 1.6), the preparation of site-specific plans (Section 1.10), public participation (Section 1.15.1), and the development of a consensus-based prioritization methodology (Section 1.4.1).

Corrective Activities: Significant progress on Corrective Activities identified in last year's Plan has been realized over the last few months. Highlights include the closure and abandonment of the Idaho National Engineering Laboratory (INEL) Injection Well in December 1989, the installation of hydrocarbon analyzers in the Kansas City Plant air monitoring system in January 1990, and the installation of a wastewater treatment unit at Lawrence Berkeley Laboratory with full-scale operation in May 1990. In addition, INEL completed a sitewide underground storage tank survey and technical disposition action plan in July 1989, which will be funded and executed as soon as possible. A Conceptual Design Report on Polychlorinated Biphenyl (PCB) Control Improvements was completed for the Paducah Gaseous Diffusion Plant in August 1989.

Environmental Restoration: The major emphasis of the Environmental Restoration Program in FY 1989 was the acceleration of waste site characterization activities, preparation of closure plans, and progress on site remediation and decontamination and decommissioning (D&D) actions. Examples of waste site characterization milestones met in FY 1989 include the completion of remedial investigation of groundwater contamination at Los Alamos National Laboratory (LANL), completion of work plans for remedial investigations in each of the four Hanford Site aggregate areas

on the National Priorities List (NPL), completion of the remedial investigation for an NPL site associated with Sandia National Laboratories-Albuquerque, completion of seven closure plans at LANL, completion of the initial phase of a groundwater characterization well plan at the Nevada Test Site, and receipt of an approval for a seepage basin closure plan and sitewide Resource Conservation and Recovery Act (RCRA) Facility Investigation program plan at the Savannah River Site (SRS). In addition, remediation activities were conducted at various sites, including the completion of the closure of four RCRA units at Y-12 in Oak Ridge, initiation of construction associated with closure of the Mixed Waste Management Facility at SRS, closure activities at the Portsmouth Gaseous Diffusion Plant, completion of remediation at two mill tailings sites and 769 Uranium Mill Tailings Remedial Action vicinity properties, and cleanup actions at LANL. D&D actions addressed the demolition of a building at Hanford and the decontamination of buildings under the purview of the Chicago Operations Office.

Waste Operations: Waste Operations over the period since the FY 1991-1995 Five-Year Plan have covered numerous activities from daily execution of facility operations to completion of major construction milestones. Accomplishments include the development of hazardous waste accumulation and storage pads at the Nevada Test Site in August 1989; the completion of a Conceptual Design Report for the Low-Level Waste Disposal, Development, and Demonstration Interim Waste Facility for Oak Ridge in

June 1989; and the completion and submittal to the Environmental Protection Agency of the Waste Isolation Pilot Plant no-migration variance petition in January 1990.

Technology Development: The Office of Technology Development was established on November 1, 1989, and staffing has been initiated for each of the divisions. Linkages to the Office of Energy Research have been established, and the Basic/Applied Research Working Group has been formed. The first annual symposium for RDDT&E for Environmental Restoration Waste Operations was held December 12-14, 1989, in San Francisco to provide guidelines for industry, university, and other Federal agencies participation. National technical programs for waste minimization and for robotics development have begun. Two pilot programs for DOE-academic partnerships are being organized in New Mexico and in South Carolina. Planning and funding for Environmental Restoration and Waste Management outreach to precollege students has been initiated, and a fellowship/scholarship program has been established. The purposes of the educational programs are to encourage students to pursue technically oriented studies and to increase the number of graduates earning degrees useful to EM. The first in a series of technology development workshops was held March 22, 1990, with a focus on transportation. Participation included other Federal agency and congressional staff, professional organizations, special interest groups, and the media, as well as DOE and contractor personnel.



Changes resulting from a new scope, new agreements with regulators, and new policy guidance have been incorporated into this Plan. The baseline for the Plan has been revised to reflect the new scope.

New Scope: As noted in Section 1.2, beginning with this Plan, the new Office of Environmental Restoration and Waste Management (EM) is responsible for landlord activities at the Hanford Reservation, the Idaho National Engineering Laboratory, and the Oak Ridge Gaseous Diffusion Plant. Other additions to EM's scope include the PUREX facility at Hanford, the Transportation Management Program, and a greatly expanded Technology Development Program. Figure 1.2 in Section 1.2 shows the revised Five-Year Plan baseline.

New Regulatory Agreements: In addition to the Rocky Flats agreement with the State of Colorado, other agreements or orders are in force or pending with Idaho, Ohio, New York, South Carolina, Tennessee, and Texas. Agreements in Principle covering additional State oversight and monitoring of DOE facilities are under development. See Appendix D for a complete list of these agreements.

New Policy Guidance: Since the publication of the FY 1991-1995 Plan, a number of internal and external events have resulted in changes to both the structure of this document and to the costs of performing planned activities:

- Corrective Activities are no longer subject to prioritization; all are Priority 1.

- EM has lead responsibility for a Programmatic Environmental Impact Statement (see Section 1.5), covering the scope of the Five-Year Plan, including modernization of EM facilities. These and other responsibilities concerning compliance with the National Environmental Policy Act will lead to increased funding requirements that cannot be fully determined.
- A proposed Department policy on contractor liability, described in a proposed rule (Federal Register, January 26, 1990) will, if approved, make Management and Operating (M&O) contractors responsible for compliance and will increase the limits of award fees to compensate M&Os for additional financial risk.
- In response to comments from a number of external reviewers, a separate and expanded section on DOE transportation activities (excluding those related to the Office of Civilian Radioactive Waste Management) is included in this update.

Improvements in Environmental Restoration Process: The DOE Office of Environment, Safety and Health is evaluating the "observational approach" as a means of accelerating the remedial investigation/feasibility study process. The approach is based on principles developed by geotechnical engineers in response to

the uncertainty of conditions encountered when constructing tunnels and other subsurface structures. Basically, the observational approach requires only that the probable conditions of the site be

known. Once the expected conditions are defined, potential, but reasonable, deviations from those conditions can be identified and contingencies prepared for responding to them.



Changes in DOE's culture involving new standards of environmental management and performance called for by the Secretary and promised in the FY 1991-1995 Five-Year Plan are turning from words to deeds.

An organization's culture is its set of shared values. Culture determines both how DOE (Federal employees and contractors) behaves internally and also how DOE interacts with other government agencies, citizen groups, and the public. The essence of DOE's emerging new culture may be characterized as tougher on the inside, softer on the outside. Together, these cultural elements constitute a declaration of a new way of doing business. Through internal discipline, DOE will achieve a focused, integrated, accountable system for accomplishing its missions. Through openness to the outside, DOE will monitor its actions to ensure they are conducted in the public interest.

Tougher on the Inside: Departmental budget requests under the former Office of Defense Waste and Transportation Management for environmental compliance and cleanup, including research and development toward such ends, have until lately been defensible only in direct relation to the agency's production mission: nuclear materials and weapons for national security. When something had to give, it was often environmental cleanup, regulatory compliance, and waste management. That era is past. Between FY 1990 and FY 1991, the President's budget for Environmental Restoration and Waste Management increased 26 percent, whereas the budget for Defense Programs increased only 11 percent (Source: DOE

Posture Statement and FY 1991 Budget Overview, DOE/MA-0400, January 1990).

Since his appointment, the Secretary has sent a clear message to DOE and contractor line organizations that responsibility and accountability will be strictly monitored, enforced, and rewarded. New and renegotiated management and operating contracts will hold contractors liable for compliance violations unless it is clear the contractor lacks the authority and necessary resources.

In Secretary of Energy Notice 11, "Setting the New DOE Course" (SEN-11-89, September 5, 1989; see Appendix F1), the Secretary stated his intention to get tougher in "compensation management. This will include expanded incentives for contractors to achieve excellence and cost effectiveness in their performance, an enhanced understanding of performance expectations and performance criteria by both Federal and contractor employees, and tighter controls to ensure that DOE line managers have the tools to ensure corrective action will be forthcoming when contractors do not perform to standards."

"Inspect, don't expect" is the new maxim. The Secretary's 10-point initiative (June 27, 1989, Appendix F2) included the stipulation that not less than 51 percent of a management and operating contractor's award fee would be based on compliance with environmental, safety,

and health requirements and that the entire award fee would be at risk if the contractor failed in any of those three categories. The results of this stipulation are being implemented as award fee determination packages are submitted for Headquarters review.

Actions since the 10-point initiative and SEN-11-89 reflect the new emphasis--and the need for the new emphasis--on "inspect." SEN-11-89 explicitly calls for strengthening the independent internal oversight function of the Assistant Secretary for Environment, Safety and Health (EH) as well as that of independent external oversight, including the Advisory Committee on Nuclear Facility Safety and the Defense Nuclear Facilities Safety Board.

Environmental Tiger Teams like the 25-person DOE investigative body the Secretary sent to Rocky Flats last June, have completed assessments of 12 more facilities: the Feed Materials Production Center at Fernald, Ohio; the West Valley Demonstration Project in New York; the Oak Ridge Y-12 Plant in Tennessee; the Savannah River Site near Aiken, South Carolina; the Portsmouth Gaseous Diffusion Plant in Ohio; the Nevada Test Site in Nevada; the Kansas City Plant in Missouri; the Pinellas Plant in Florida; the Lawrence Livermore National Laboratory in California; Brookhaven National Laboratory in New York; the Pantex Facility near Amarillo, Texas; and the Mound Plant in Miamisburg, Ohio. On January 26, 1990, the Secretary issued a "Preliminary Review of Trends in Tiger Team Assessments" (Appendix F3) highlighting areas of deficiencies and calling for immediate attention to remedying them.

Decision to Prepare Programmatic Environmental Impact Statements (EISs):

In the FY 1991-1995 Five-Year Plan, DOE committed to making a sharp departure from its traditional, unconsolidated approach to environmental restoration and waste management. In support of this commitment and point 4 of his 10-point initiative, the Secretary on January 12, 1990, released his decision that the Department, in accordance with the National Environmental Policy Act (NEPA), will prepare two major programmatic Environmental Impact Statements (EIS). One will address the activities proposed in the Five-Year Plan. The second will address environmental issues related to the Department's long-term plans to renovate the aging nuclear weapons complex. For details on the two EISs, see Section 1.5.

Words soon to become deeds speak loudly and clearly from SEN-15-90 (February 5, 1990; see Appendix F4): "I intend to hold each Secretarial Officer whose line organization is responsible for the preparation of NEPA analyses personally accountable for the quality and sufficiency of these analyses... I will be notified of each instance in which a draft Environmental Assessment or EIS submitted by a Secretarial Officer is returned by EH for revision to cure significant deficiencies related to the technical completeness or accuracy of the documents. Where there are gaps in the required expertise for the proper supervision of the preparation of NEPA documentation, the line organizations will be augmented to acquire the necessary talent."



"The new culture," the Secretary said in SEN-11-89, "will emphasize an open door philosophy and demand professional excellence in both government and contractor performance, and it will be a culture wherein constructive criticism from any source, external as well as internal, is encouraged and rewarded."

Expanded External Review: DOE has added six States (California, Florida, Illinois, Missouri, New York, and Texas) and the Confederated Tribes of the Umatilla Indian Reservation (Oregon) to the State and Tribal Government Working Group (STGWG). This larger group met for the first time in March 1990 to review a formulative draft of this Plan. Since last October, the External Review Group, composed of some STGWG members plus representatives of the Environmental Protection Agency (EPA), the Environmental Defense Fund, and the Natural Resources Defense Council, has participated in the design of a rigorous, risk-based methodology for prioritizing remedial activities.

One noteworthy outcome of last year's STGWG participation in the Five-Year Plan was DOE's decision not to seek uniform national standards specifying "how clean is clean." States hold regulatory primacy under the Resource Conservation and Recovery Act (RCRA); and absent a change in the law, or a movement toward uniform standards by States and Indian Nations on their own, or by the Congress, DOE will have to meet applicable State standards, despite inconsistencies among them. Another outcome was DOE's direction to Operations Offices to establish formal procedures for negotiating with affected Indian Tribes.

April 1990 saw the first meeting of the Stakeholders Forum. Convened to broaden the range of external review, the

Forum included more than 40 participants representing DOE, the EPA, the Office of Management and Budget, the Office of Technology Assessment, industry, labor, academia, States, Indian Nations, the National Academy of Sciences, the Electric Power Research Institute, the Energy Research Foundation, the Occupational Health Foundation, the Sierra Club, the League of Women Voters, the Environmental Defense Fund, and the Natural Resources Defense Council. Major topics of discussion were (1) DOE's need to devise a process whereby its new culture can permeate the field and contractor organizations, including holding forums with local stakeholders; (2) DOE's need to develop and implement a rational, effective, clearly understandable system for prioritizing its compliance and cleanup activities; (3) DOE's need to concentrate on source reduction and interim actions to confine contamination so that problems that cannot be solved now will at least not worsen; and (4) DOE's need to set realistic environmental restoration and compliance expectations, given the limits of current technologies and the fact that breakthroughs cannot be forced to occur. DOE agrees with all four points and will continue to work to fulfill these needs.

Environmental Hotline: In his 10-point initiative (Appendix F2), the Secretary promised to establish a special hotline within DOE Headquarters to citizens to report specific facility concerns. The Hotline is operated by the Office of

Inspector General 24 hours a day. Outside the Washington, D.C., area the number is 1-800-541-1625; within the Washington area the number is 586-4073.

To assist Tiger Teams in their work, special local hotline numbers are established. Four to six weeks before a Tiger Team evaluation, there is a Preassessment Site Visit. The preassessment team meets with the local press to publicize the upcoming evaluation. Posters at the facility and in the community advertise both the local and the 800 number.

DOE Notice 2320.1 (Appendix F5), signed by the Secretary and distributed to all departmental personnel, sends a clear message: "This Hotline provides an opportunity to report environmental, safety or health concerns you might have regarding DOE operations. Normally, your concerns should be reported through regular channels of communication. However, if for any reason you believe your concerns will not or cannot be addressed properly within your organization, you may report the matter through the Hotline." Calls received by the Hotline are immediately referred to the Assistant Secretary for Environment, Safety and Health (ASEH).

Agreements in Principle with States for Environmental Monitoring at DOE

Facilities: The Secretary's 10-point initiative also addressed improving DOE's accountability in the areas of public health, safety, and environmental protection by allowing States hosting DOE facilities direct access to those facilities, and supporting State oversight of DOE environmental monitoring programs. To support this initiative, DOE has invited 11 States to negotiate and execute formal agreements. These negotiations are currently under way. The agreements will

focus on State oversight of DOE programs for monitoring air, groundwater, and surface water in the vicinity of DOE facilities and DOE's compliance with applicable environmental laws and regulations. State oversight can include, as appropriate, review of the following DOE activities or systems: environmental monitoring protocol; sampling methods; quality assurance and quality control measures; data collection and management systems; chain of custody process; and reporting methods. The agreements may also support periodic State monitoring of discharges, emissions, or biological parameters as necessary to verify the effectiveness of DOE's monitoring program. Funding to implement the agreements and to support State monitoring activities will be provided by the Operations Offices through a DOE grant. There is also an Office of Health initiative to work with States to support public health activities and epidemiologic studies in populations living in the vicinity of DOE facilities.

Release of Epidemiological Data:

SEN-11-89 promised to initiate a "program to ensure DOE's epidemiologic research activities are appropriate, effective, and represent excellence." In August 1989, the Secretary appointed the Secretarial Panel for the Evaluation of Epidemiologic Research Activities (SPEERA). Chaired by the Secretary of Health for the State of Washington, the panel is made up of nine highly respected public health professionals whose charge includes site visits, public meetings, invited testimony, and review of documents. The National Academy of Sciences (NAS) has also formed a committee to help DOE develop mechanisms for access to data by non-DOE researchers. SPEERA and the NAS committee are reviewing a draft program plan for a Comprehensive Epidemiologic Data Resource (CEDR).

An interim CEDR containing data on approximately 70,000 workers has been established.

Implementing Recommendations of SPEERA Final Report: On March 27, 1990, SPEERA presented to the Secretary its independent evaluation of the appropriateness, effectiveness, and overall quality of DOE epidemiologic and related occupational health activities. As a result of the panel's report, the Secretary issued six directives to the ASEH. The first five directives concern DOE's internal day-to-day line management responsibility for health; the sixth calls upon the Department of Health and Human Services (HSS) to manage long-term health studies of workers at DOE facilities. Briefly, the six directives (1) create the Office of Health at the Deputy Assistant Secretary level, with responsibility for occupational health and epidemiology, with a plan for consolidating existing DOE epidemiology staff and resources into this new office due by May 1, 1990; (2) develop within this new office an epidemiology program including appropriate surveillance for the occurrence of occupational diseases and disabilities in worker populations; (3) establish an advisory committee to the ASEH to monitor the activities of this new office; (4) establish protocols and policies that ensure ready access to DOE epidemiologic data by researchers while balancing the need for protecting individual privacy; (5) examine, in detail, each of SPEERA's more than 50 recommendations, with an overall implementation strategy developed by June 30, 1990, and with appropriate final actions taken by August 1, 1990; (6) develop a Memorandum of Understanding between DOE and HHS to establish an effective and credible external analytical epidemiology research program

managed by HHS to support DOE's needs. Informal discussions with the Secretary of HHS indicate that Department's willingness to provide this support.

Comment by a STGWW Participant: At an October 29, 1989, conference ("Department of Energy Defense Programs Restoration: Doing Good Business in A New Culture"), a STGWW participant from the National Conference of State Legislatures spoke on "Ensuring Environmental Quality: A View from the States." She said, "I think the consensus of the working group is that the Department has been very receptive to our comments and that the plan is a much stronger document as a result of the States and Tribes having the opportunity to comment on the plan before it became a 'final' document. By their responsiveness to our comments and questions, the task force for the Five-Year Plan is providing examples of the change in corporate culture advocated in the plan."

This individual comment should not be construed to imply STGWW's endorsement of the Five-Year Plan. STGWW participants are and will remain independent voices, whether pro or con. DOE will remain receptive to STGWW and to other interested parties and individuals. This does not mean DOE will agree with or commit to do (unless it is the law or part of a signed agreement) everything suggested. DOE's culture is not the only culture that must change. As DOE demonstrates its willingness to listen to its critics and its ability to meet commitments, trust will begin to increase among all parties, and the appropriateness of adversarial postures will decrease. In short, the stakeholders' culture must change also.

This page intentionally left blank.

1.15.1 EMPHASIS ON PUBLIC PARTICIPATION PLANS AND ACTIVITIES



DOE Operations Offices will prepare and implement public participation plans, spelling out specific activities for involving the public as part of their second cycle of site-specific five-year plans.

In establishing the new Office of Environmental Restoration and Waste Management (EM), the Secretary recognized the need to interface with the public to develop a program of public confidence and to regain the credibility promised to the public and the Congress. Public participation will be given much attention in EM, and one of the primary functions will be to involve the public in all aspects of environmental restoration and waste management activities, from planning and design through implementation. In short, DOE will demonstrate its commitment to open, candid public communication and compliance with environmental laws and regulations.

Last year, DOE formalized external involvement in the Environmental Restoration and Waste Management Five-Year Plan and the Draft Research, Development, Demonstration, Testing, and Evaluation (RDDT&E) Plan at the Federal, State, peer technical, and general public levels.

Beginning with this Plan, DOE will extend formal involvement to local communities near its facilities and sites. The mechanism for expanded public participation will be public participation plans for DOE's major installations, to be specified by Operations Offices in their Site-Specific Plan (SSP).

These public participation plans will be a component of the SSPs and will record

specific activities planned and initiated by the Operations Office to involve the public and local communities in environmental restoration and waste management activities. The SSPs will also document compliance with specific public participation requirements of environmental laws and statutes, such as the community relations plan and program required by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

In addition to specifying how they will fulfill legal requirements, Operations Office public participation plans will address how the field plans to meet the following objectives of EM's public participation effort: to ensure that both the letter and the spirit of the public participation requirements of CERCLA, the National Environmental Policy Act (NEPA), and the Resource, Conservation, and Recovery Act (RCRA) are met; to get the public's help to identify EM problems and issues that should be addressed; to identify alternative solutions to those problems and issues; to identify the importance of environmental, social, economic, and cultural conditions and values to be promoted and protected; to address conflicts among competing values; to pursue consensus toward EM actions and decisions in the best overall public interest; and to increase public understanding of the complexity of EM problems and issues.

In mid-November 1989, a videotape of the EM Director was presented to Headquarters and field representatives as part of a DOE Community Relations/Public Involvement workshop conducted by the Assistant Secretary for Environment, Safety and Health (EH). The message was to carry the torch of DOE's emerging new culture. In mid-December, EH completed the final draft outline of a guidance document for meeting the public participation requirements of CERCLA, RCRA, and NEPA.

Compliance with the community relations/public involvement requirements and implementing regulations of CERCLA, RCRA, and NEPA mandates site-specific activities that elicit the public's comments and concerns regarding DOE environmental restoration activities.

These requirements include the drafting of plans for involving communities in the planning and implementation process and for responding to their concerns. Departmental policy is to fulfill this mandate, and Headquarters will fully support Operations Offices' efforts to involve the public in its environmental restoration activities early and throughout the process.

Under this public participation program, DOE can begin two-way communication with communities and the general public. In accordance with the Secretary's directive that line managers will have primary responsibility and accountability for environmental oversight, Operations Office managers will be responsible for requesting the resources, both staff and budget, to carry out this program.



Waste minimization's (WMIN's) contribution to environmental compliance results from changes in administrative policy and cultural attitudes as well as technical factors and must be compatible with DOE missions.

WMIN is the most interdisciplinary of waste management tools and will affect all present and proposed DOE operations. The goal of WMIN is to avoid the generation of waste that would then require treatment, storage, or disposal. This goal can be attained by various measures, including administrative actions, material substitution, recycling, and process changes. Technical options are described in Section 5.3.1. Establishing a successful WMIN program will require cultural as well as technical changes in the DOE complex. A "design for minimization" philosophy must be adopted throughout the DOE system. Improvements in waste generation reporting and administrative procedures can eliminate a significant amount of waste classified as radioactive because no one is certain of its nature; and "If in doubt, assume it's contaminated."

DOE and its predecessor agencies practiced WMIN for many years in an ad hoc fashion, but DOE is now moving to a formal program. Experience indicates that employee training and education aimed at developing sensitivity toward WMIN is a key to success. The DOE Waste Minimization and Avoidance Group (October 1988) highlighted several successes as examples. Lawrence Livermore National Laboratory achieved an elevenfold reduction in hazardous waste by issuing solvents in 5-gal containers rather than 55-gal containers. Employees had previously discarded unused solvent as waste. The Rocky

Flats Plant reduced wastewater by three million gallons per year by repairing faulty valves. The Pinellas Plant significantly reduced solvent usage by testing the effectiveness of solvents rather than automatically discarding them at the label date. The Hanford Site recycled paint thinners used for cleaning and reduced solid waste by recycling steel drums.

WMIN technology development and transfer must be managed through collaboration involving the operating program(s) as well as production and technical staff to ensure that those affected by the WMIN technology are involved in the decision making. The stringent safety and reliability requirements for nuclear weapons mean that materials used in their manufacture must maintain their performance characteristics and be chemically compatible over a weapon's operational lifetime. New programs may thus be required at the DOE design laboratories and production plants to assess and adjust for the impact of material and process changes resulting from WMIN on product performance, stockpile reliability, and safety.

Consistent and comprehensive reporting of waste streams will be implemented DOE-wide to establish baseline waste generation. The data will identify areas with significant potential benefits from WMIN and allow management to measure progress. A generally accepted method for measuring WMIN progress in terms of

hazard reduction is not available. One substitute approach that will be used is to follow the volume or weight of waste generated over a period of time. WMIN does not, however, include reducing the volume of waste once it is generated.

A problem in measuring WMIN progress is accounting for changes in facility activity level, program content, and regulatory requirements (including waste definition). One way to avoid misinterpretation of reported data is to relate the reported generation level to activity levels (such as unit output, facility operational time, or decontamination activities). Multiyear comparisons of waste generated should note any applicable regulatory changes.

The potential for WMIN within DOE is high but quite variable from site to site. Defense production plants that generate large single-stream waste volumes have a higher potential for WMIN than research labs that generate multiple small volume streams. DOE's policy is to minimize waste generation to the extent possible at each site. WMIN goals will be set and vigorously pursued, but whether the ambitious estimates discussed in Section 5.3.1 can be achieved systemwide depends on the successful blending of new technologies with administrative and cultural changes throughout the complex.

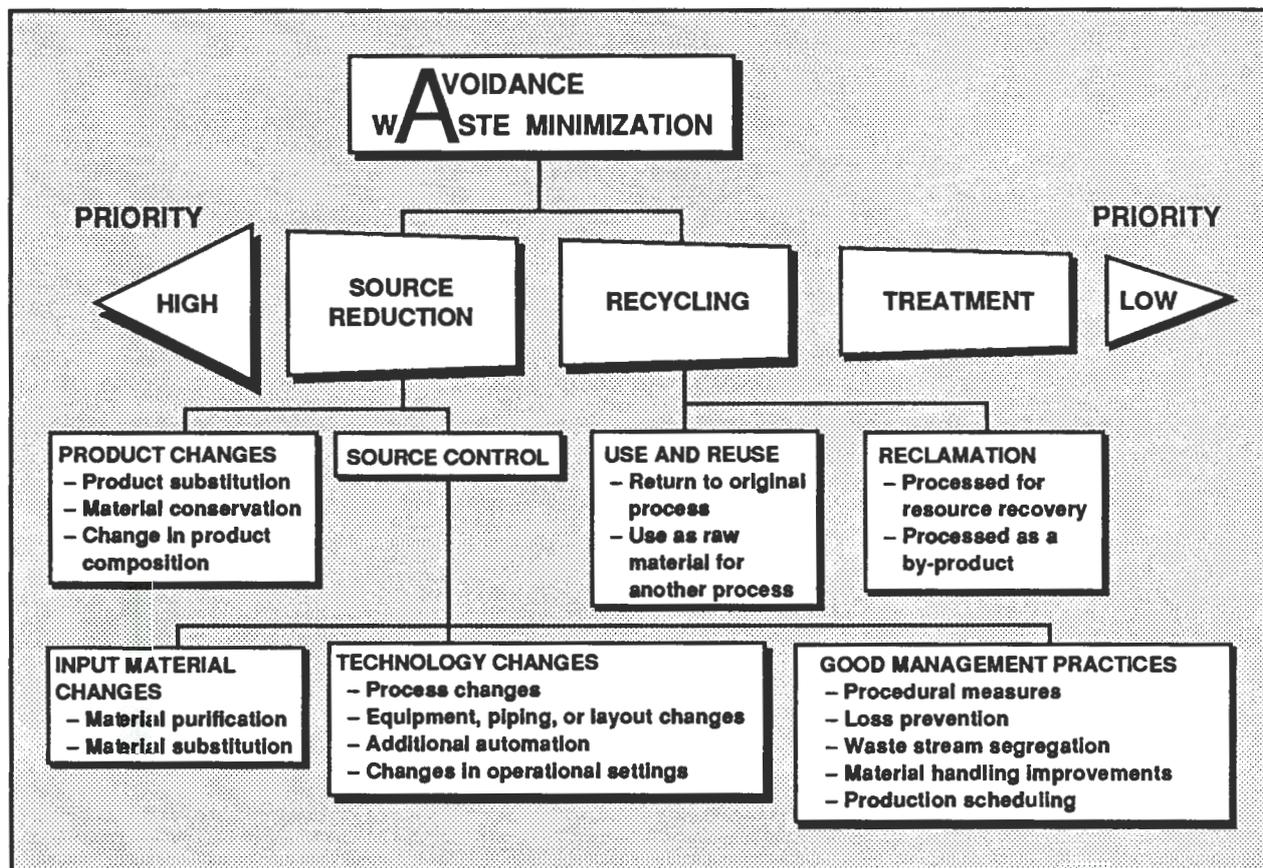


Figure 1.16. The Department of Energy waste minimization activities will emphasize those waste reduction measures that eliminate waste before it is generated. Wastes that cannot be eliminated by minimization techniques may be treated to reduce volumes or toxicity before disposal.

**THIS PAGE INTENTIONALLY
LEFT BLANK**