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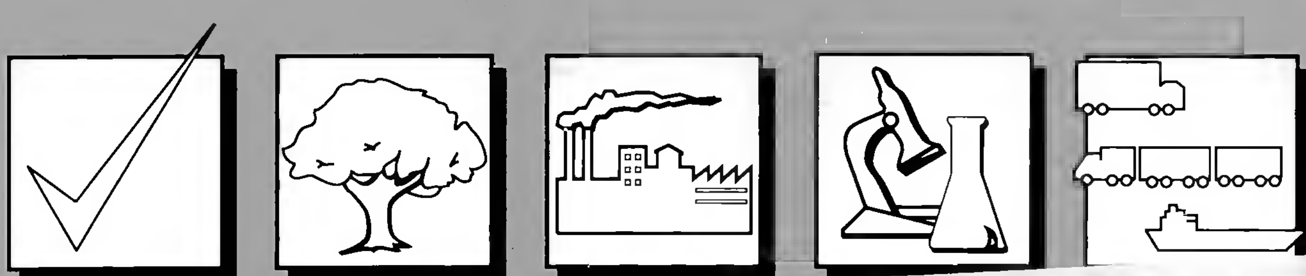
United States Department of Energy

Environmental Restoration and Waste Management

Five-Year Plan
Fiscal Years 1992-1996

June 1990



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Environmental Restoration and Waste Management

Five-Year Plan
Fiscal Years 1992 - 1996

June 1990

United States Department of Energy

Washington, DC 20585

MASTER

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)

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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.

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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.

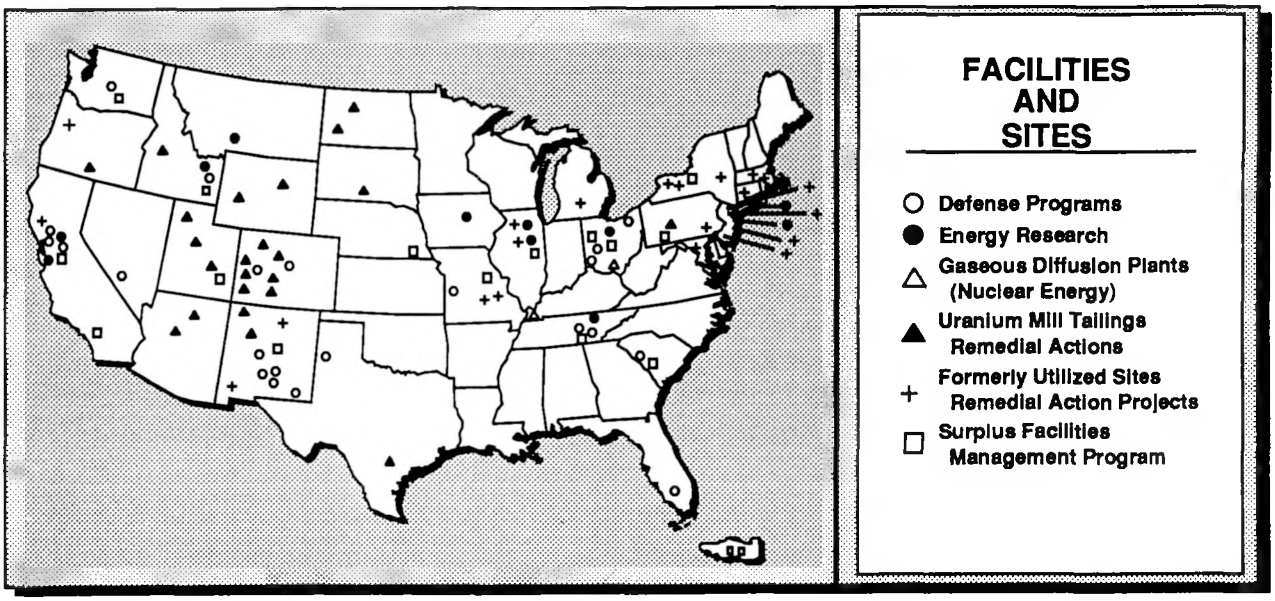


Figure 1.1. This Five-Year Environmental Restoration and Waste Management Plan, FY 1992-1996 addresses Environmental Restoration, Waste Operations, Corrective Activities, and Technology Development at nearly 100 sites located in 31 States and Territories.

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.

<u>Sources of Increase and Uncertainty</u>: 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, <u>Federal Register</u> 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) Total	Validated	Unvalidated [A]	FY 1992 ($ in Millions) Total	Validated	Unvalidated [A]
Priorities 1 - 3	3,024	2,882	142 [B]	3,403	3,403	0
Priority 4	298	0	298	319	0	319
Subtotal	3,322	2,882	440	3,722	3,403	319
New Scope to Five-Year Plan						
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	0	28	28	0
Program Direction (HQ & Field)	54	32 [D]	22	86	40	46
Subtotal	265	191	74	508	306	202
Cost Increases for Existing Scope						
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	61	0	61	76	0	76
Subtotal	697	258	439	1,507	500	1,007
Field Cost Estimates for FY 1992 Plan	4,284	3,331	953	5,737	4,209	1,528
Technology Development [E]	156	156	0	230	230	0

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

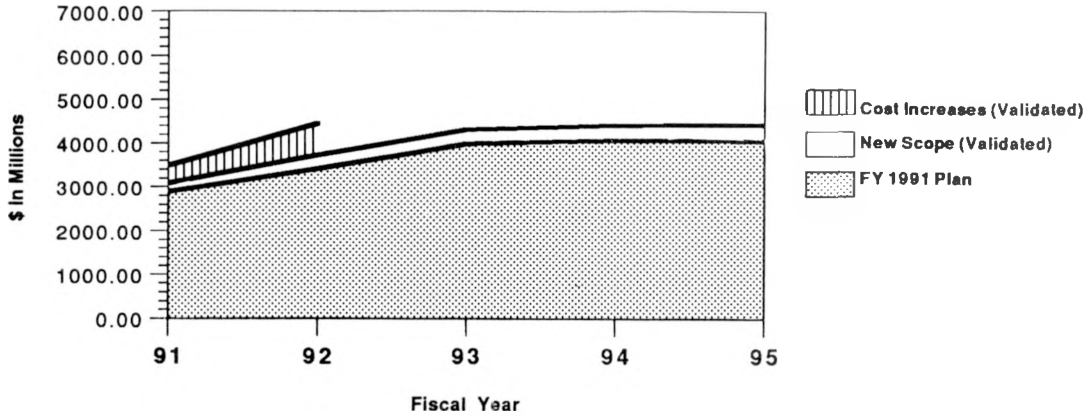
B = $142 million is for Program slippage.

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.

<u>What Is Not Smart?</u>

- 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.

<u>What is Smart?</u>

- 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.

<u>Reaffirmed Goals</u>:

- 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.

<u>Reaffirmed and New Commitments for FY 1990</u>:

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

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.

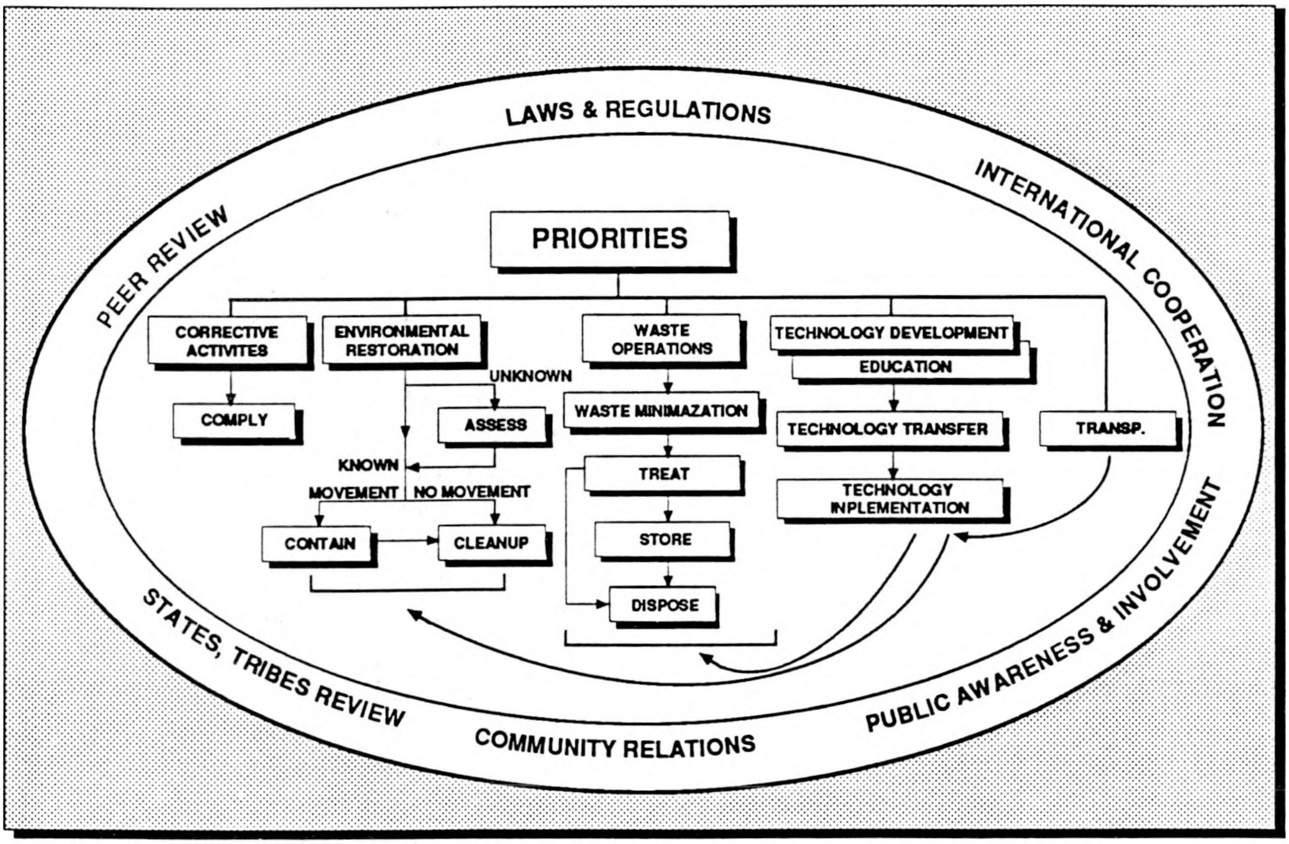
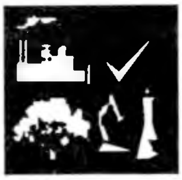


Figure 1.3. The Department of Energy's priorities for Corrective Activities, Environmental Restoration, Waste Operations, Technology Development (including Education), and Transportation are set within a context of laws and regulations, public awareness and involvement, and technical peer review.

1.4 PRIORITIZATION AND FUNDING OF PROGRAM ACTIVITIES



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.

<u>Priority 1</u>: 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.

<u>Priority 2</u>: 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.

<u>Priority 3</u>: 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.

<u>Priority 4</u>: 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.

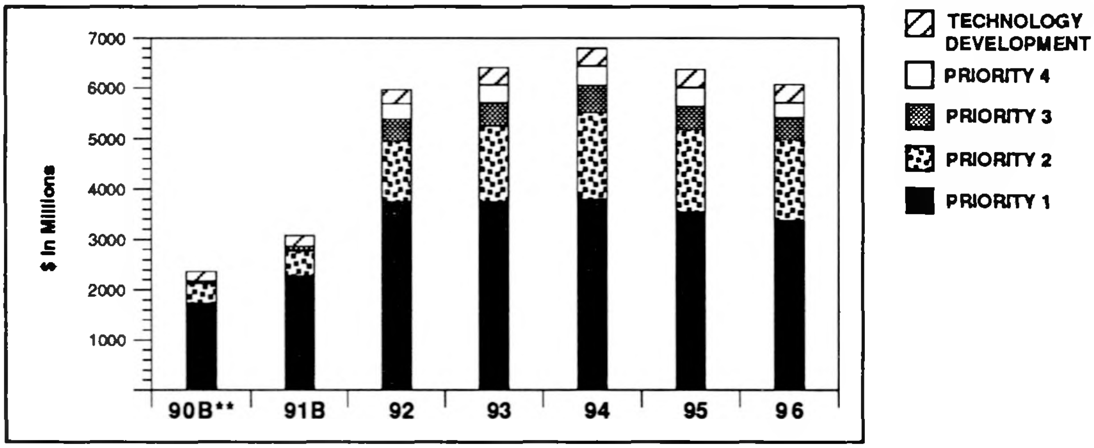
In FY 1991, the Office of Technology Development will develop a prioritization and selection process that will include a more rigorous environmental restoration and waste management needs analysis. Because of the requirements for transportation to support all ongoing Departmental shipping, all transportation 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.)

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 Rivi	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

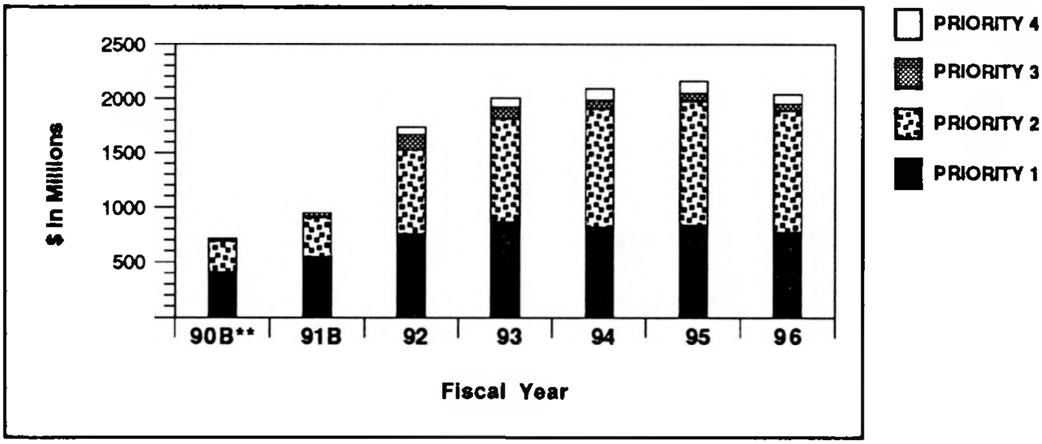
* Numbers may not add up to totals due to rounding.
** Includes Congressional add on.
*** Includes transportation, uranium enrichment, landlord, and program slippage.

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

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

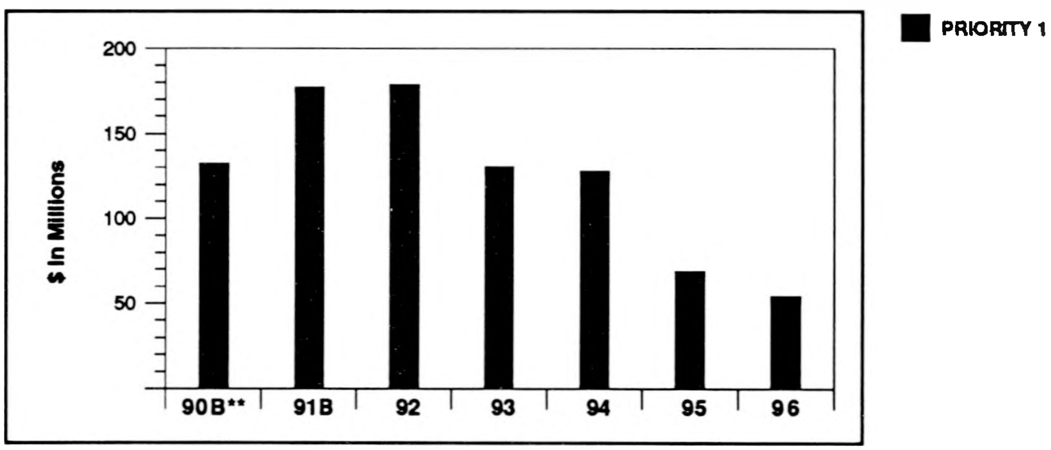
* Numbers may not add up to totals due to rounding.
** Includes Congresstional add on.

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

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



(All Corrective Activities are Priority 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

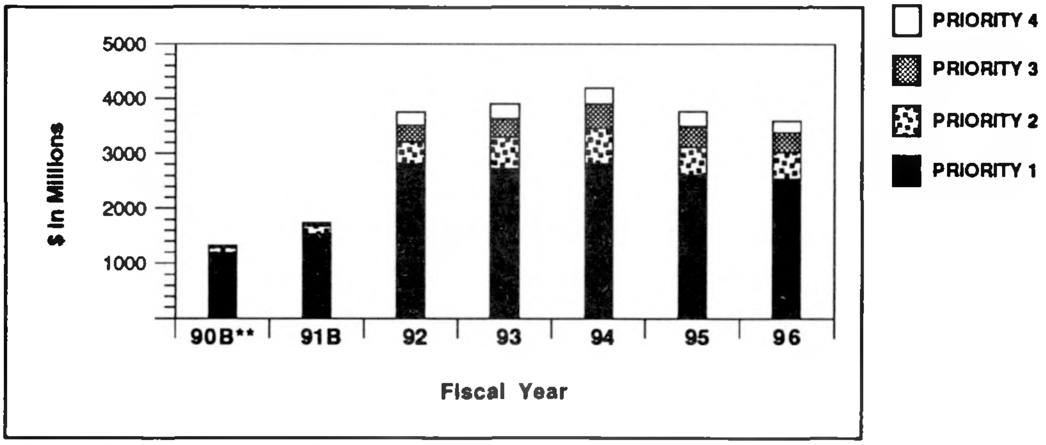
* Numbers may not add up to totals due to rounding.
** Includes Congresstional add on.

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.

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	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



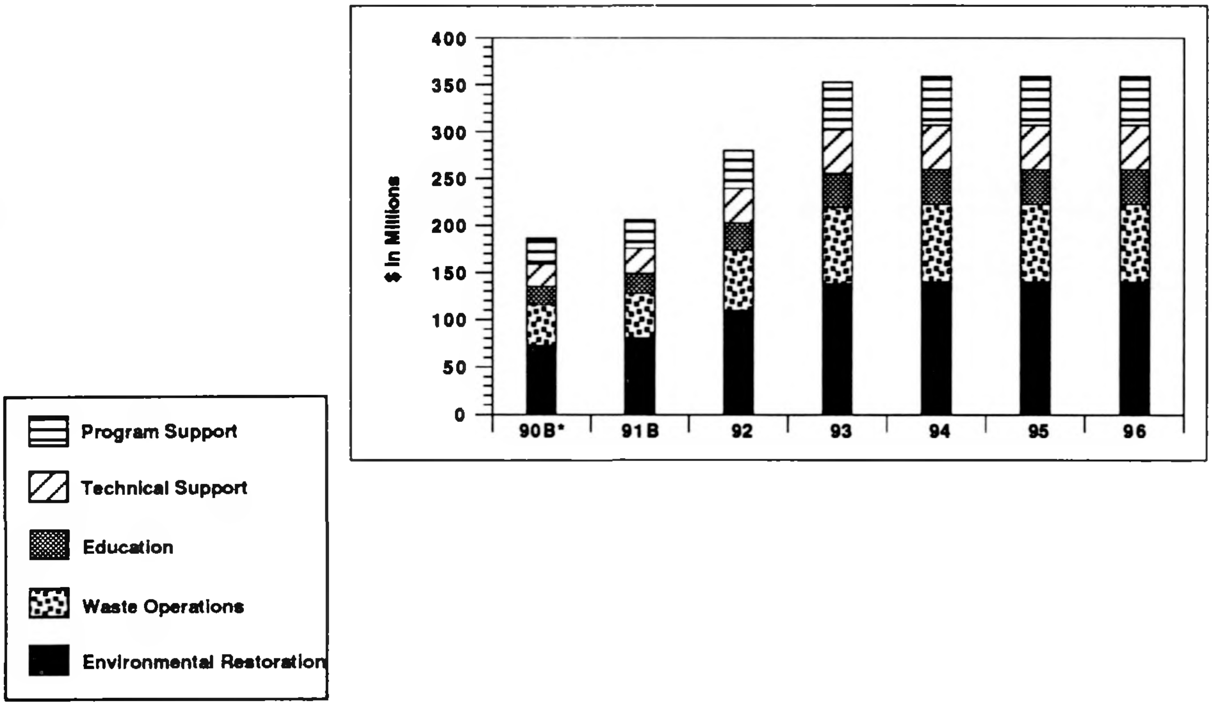
Funding and Estimates of Costs By PRIORITY - Fiscal Year ($ in Millions)*

	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.

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 Categories - Fiscal Year ($ in Millions)**

	1990B*	1991B	1992	1993	1994	1995	1996
Environmental Restoration	73.0	80.7	109.8	138.3	140.6	140.6	140.6
Waste Operations	42.7	47.2	64.2	80.9	82.2	82.2	82.2
Education	19.2	21.2	28.9	36.3	37.0	37.0	37.0
Technical Support	24.3	26.9	36.6	46.1	46.9	46.9	46.9
Program Support	27.1	30.0	40.8	51.4	52.3	52.3	52.3
TOTAL	186.3	206.0	280.3	353.0	359.0	359.0	359.0

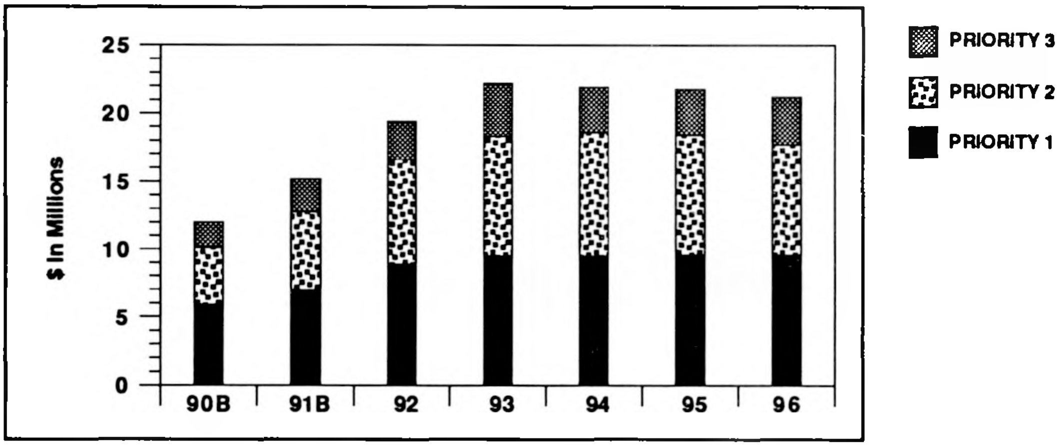
* Includes Congressional add on.
** Numbers may not add up to totals due to rounding.

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.

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	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



Funding and Estimates of Costs By PRIORITY - Fiscal Year ($ in Millions)*

	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.

<u>Step 3b.1: Develop Measures for Objectives</u>. 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.

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

<u>Step 3b.3: Determine Relative Importance of Objectives</u>. 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.

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

<u>Step 3b.5: Provide Decision Makers with Results of Analyses</u>.

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

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

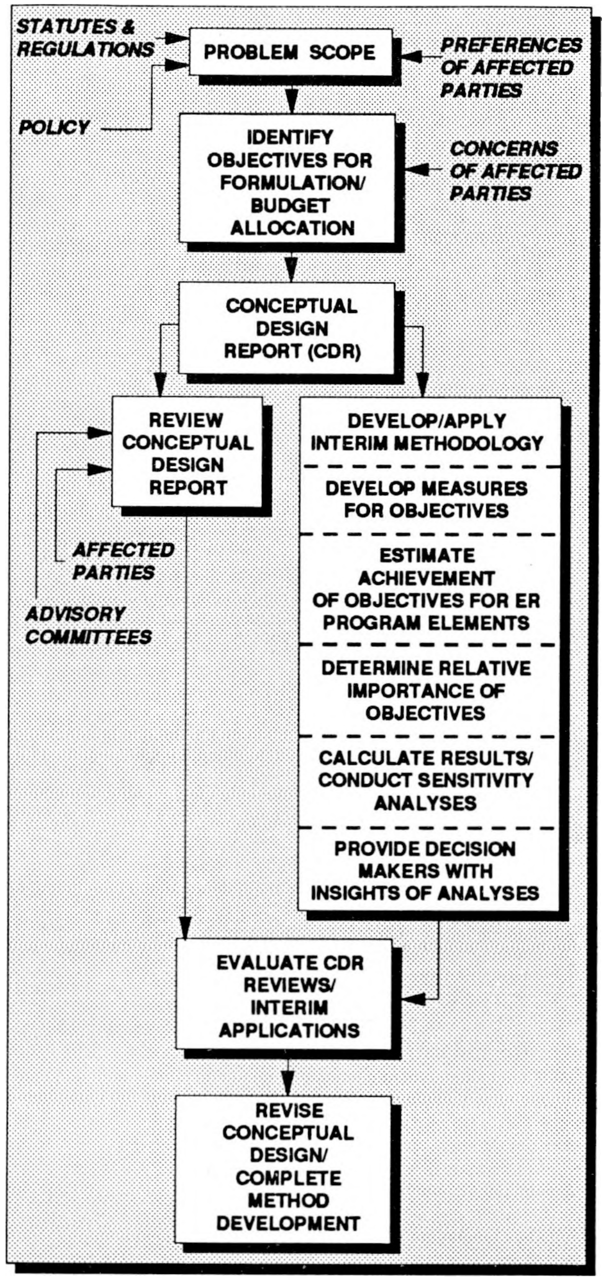


Figure 1.4.1. Steps to Environmental Restoration prioritization methodology development take two converging paths.

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.

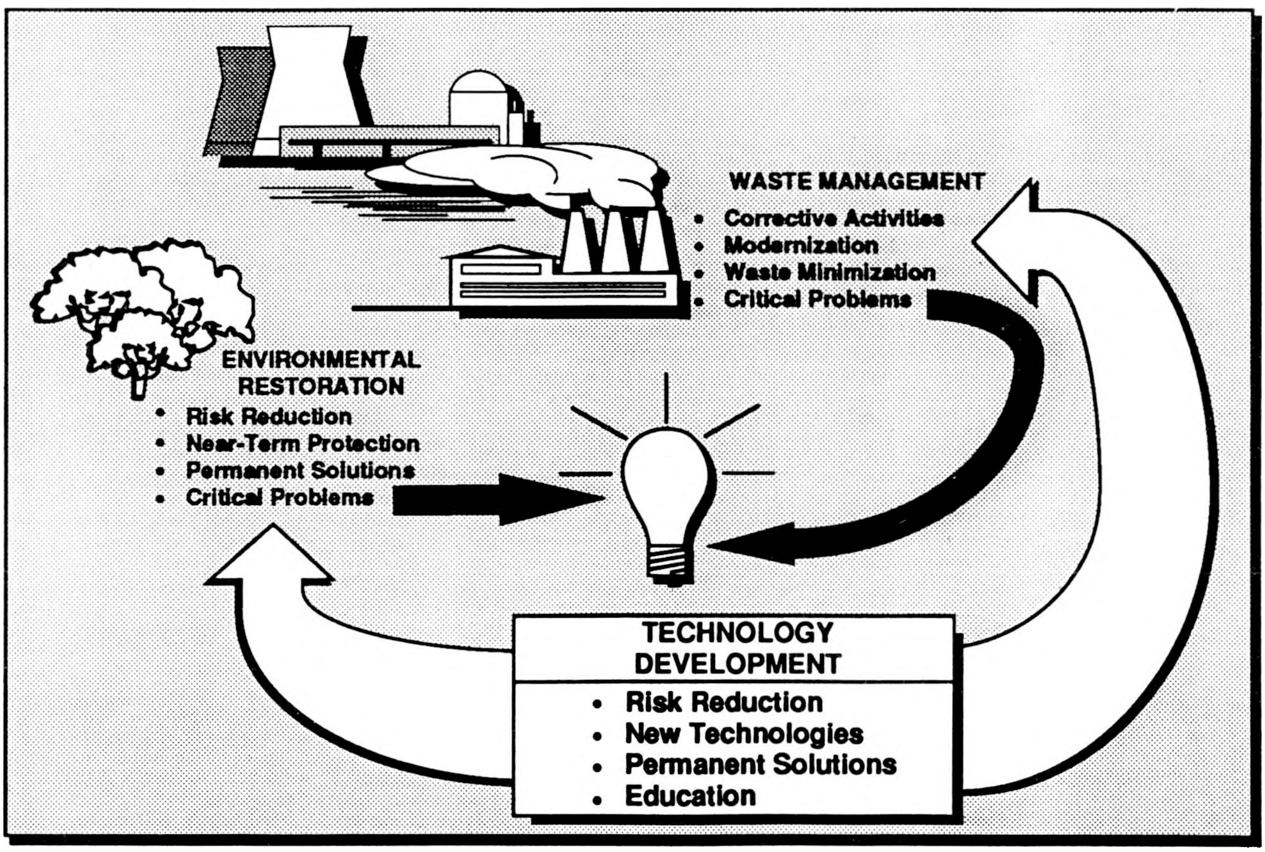


Figure 1.5. The Department of Energy's strategy for achieving its 30-year compliance and cleanup goal is strongly dependent on research and development to provide technological breakthroughs for solving critical problems.

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.

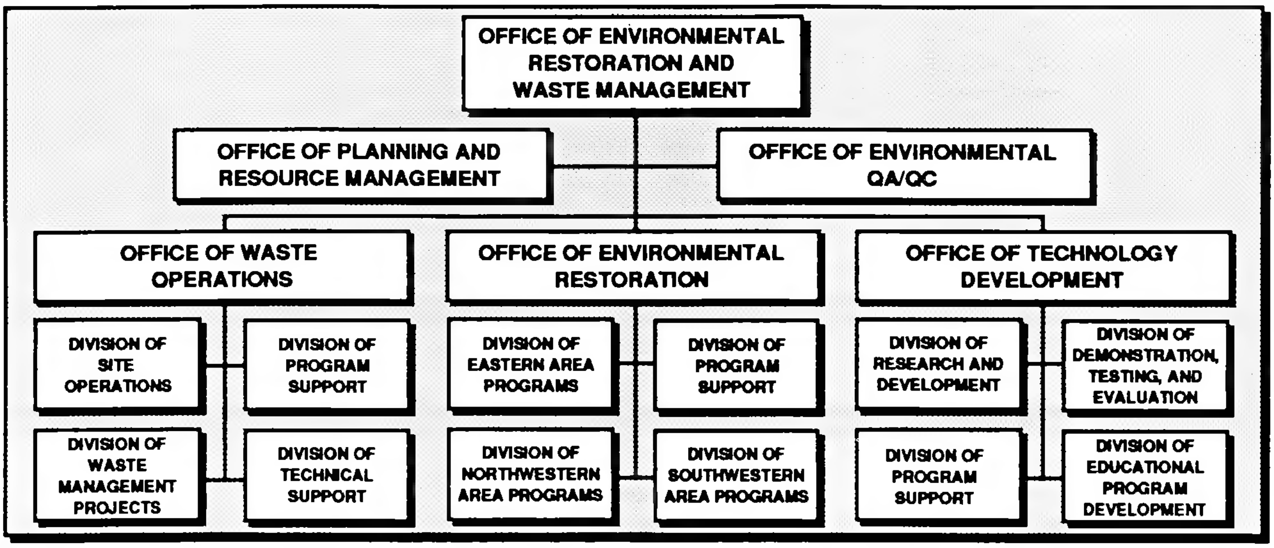


Figure 1.6. The Department of Energy has established the Office of Environmental Restoration and Waste Management to provide integrated management to waste operations and cleanups and their associated technology development requirements. (QA = Quality Assurance, QC = Quality Control)

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.

<u>Integration at the Project Level</u>: 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.

<u>Integration of Environmental Restoration and Waste Operations Activities Using "Roadmaps"</u>: 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.

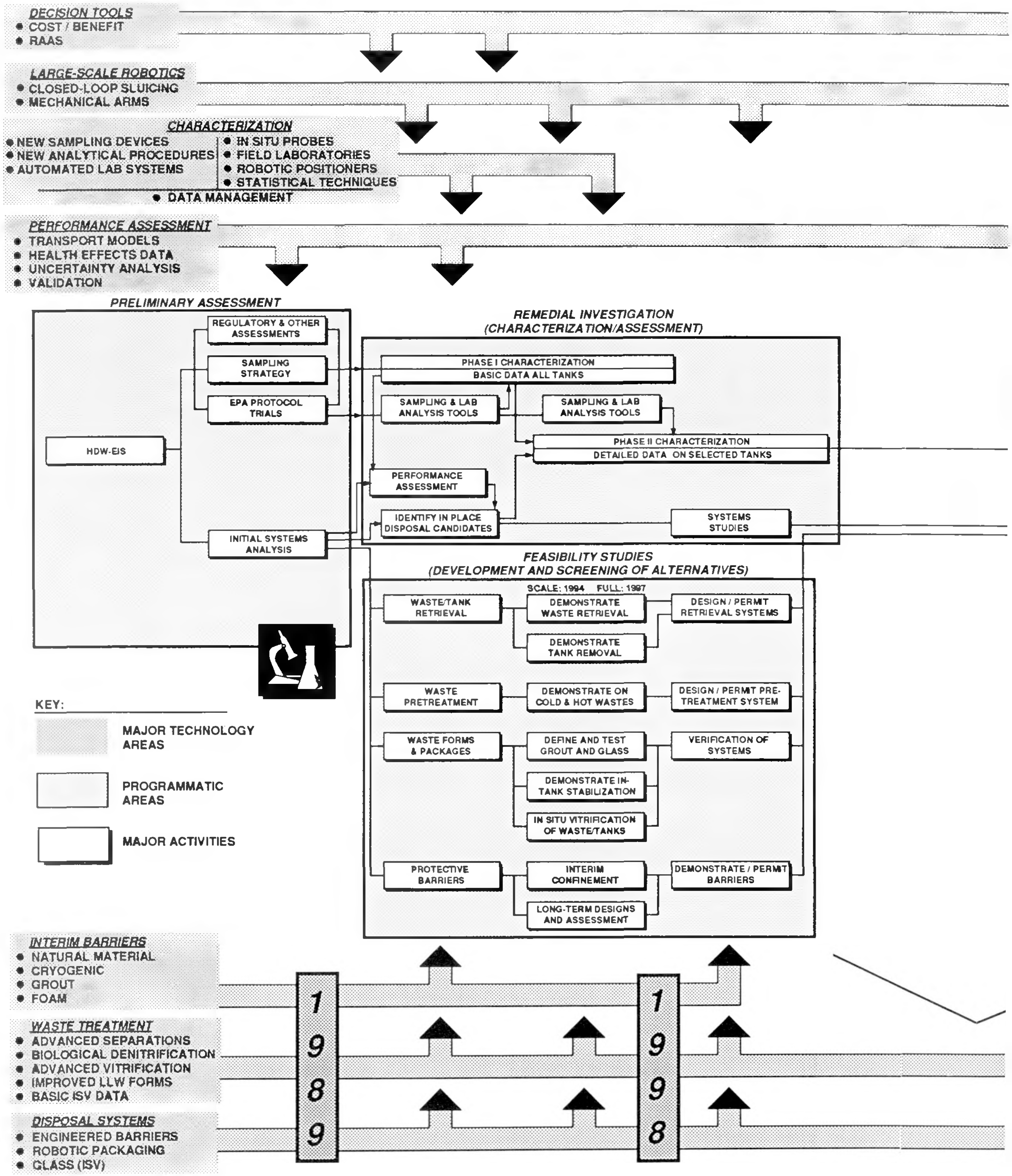
These logic diagrams show the "destination," such as the operation of a treatment facility or the containment of a particular contamination plume; the "route" to be followed (including interactions with routes leading to other destinations); and the "distance" or time to reach each destination (with 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.


DECISION TOOLS
• COST / BENEFIT
• RAAS
LARGE-SCALE ROBOTICS
• CLOSED-LOOP SLUICING
• MECHANICAL ARMS
CHARACTERIZATION
• NEW SAMPLING DEVICES
• NEW ANALYTICAL PROCEDURES
• AUTOMATED LAB SYSTEMS
• IN SITU PROBES
• FIELD LABORATORIES
• ROBOTIC POSITIONERS
• STATISTICAL TECHNIQUES
• DATA MANAGEMENT
PERFORMANCE ASSESSMENT
• TRANSPORT MODELS
• HEALTH EFFECTS DATA
• UNCERTAINTY ANALYSIS
• VALIDATION
PRELIMINARY ASSESSMENT
REGULATORY & OTHER ASSESSMENTS
SAMPLING STRATEGY
EPA PROTOCOL TRIALS
HDW-EIS
INITIAL SYSTEMS ANALYSIS
REMEDIAL INVESTIGATION (CHARACTERIZATION/ASSESSMENT)
PHASE I CHARACTERIZATION
BASIC DATA ALL TANKS
SAMPLING & LAB ANALYSIS TOOLS
SAMPLING & LAB ANALYSIS TOOLS
PHASE II CHARACTERIZATION
DETAILED DATA ON SELECTED TANKS
PERFORMANCE ASSESSMENT
IDENTIFY IN PLACE DISPOSAL CANDIDATES
SYSTEMS STUDIES
FEASIBILITY STUDIES (DEVELOPMENT AND SCREENING OF ALTERNATIVES)
SCALE: 1994 FULL: 1997
WASTE/TANK RETRIEVAL
DEMONSTRATE WASTE RETRIEVAL
DESIGN / PERMIT RETRIEVAL SYSTEMS
DEMONSTRATE TANK REMOVAL
WASTE PRETREATMENT
DEMONSTRATE ON COLD & HOT WASTES
DESIGN / PERMIT PRE-TREATMENT SYSTEM
WASTE FORMS & PACKAGES
DEFINE AND TEST GROUT AND GLASS
VERIFICATION OF SYSTEMS
DEMONSTRATE IN-TANK STABILIZATION
IN SITU VITRIFICATION OF WASTE/TANKS
PROTECTIVE BARRIERS
INTERIM CONFINEMENT
DEMONSTRATE / PERMIT BARRIERS
LONG-TERM DESIGNS AND ASSESSMENT
KEY:
MAJOR TECHNOLOGY AREAS
PROGRAMMATIC AREAS
MAJOR ACTIVITIES
INTERIM BARRIERS
• NATURAL MATERIAL
• CRYOGENIC
• GROUT
• FOAM
WASTE TREATMENT
• ADVANCED SEPARATIONS
• BIOLOGICAL DENITRIFICATION
• ADVANCED VITRIFICATION
• IMPROVED LLW FORMS
• BASIC ISV DATA
DISPOSAL SYSTEMS
• ENGINEERED BARRIERS
• ROBOTIC PACKAGING
• GLASS (ISV)
1989
1998

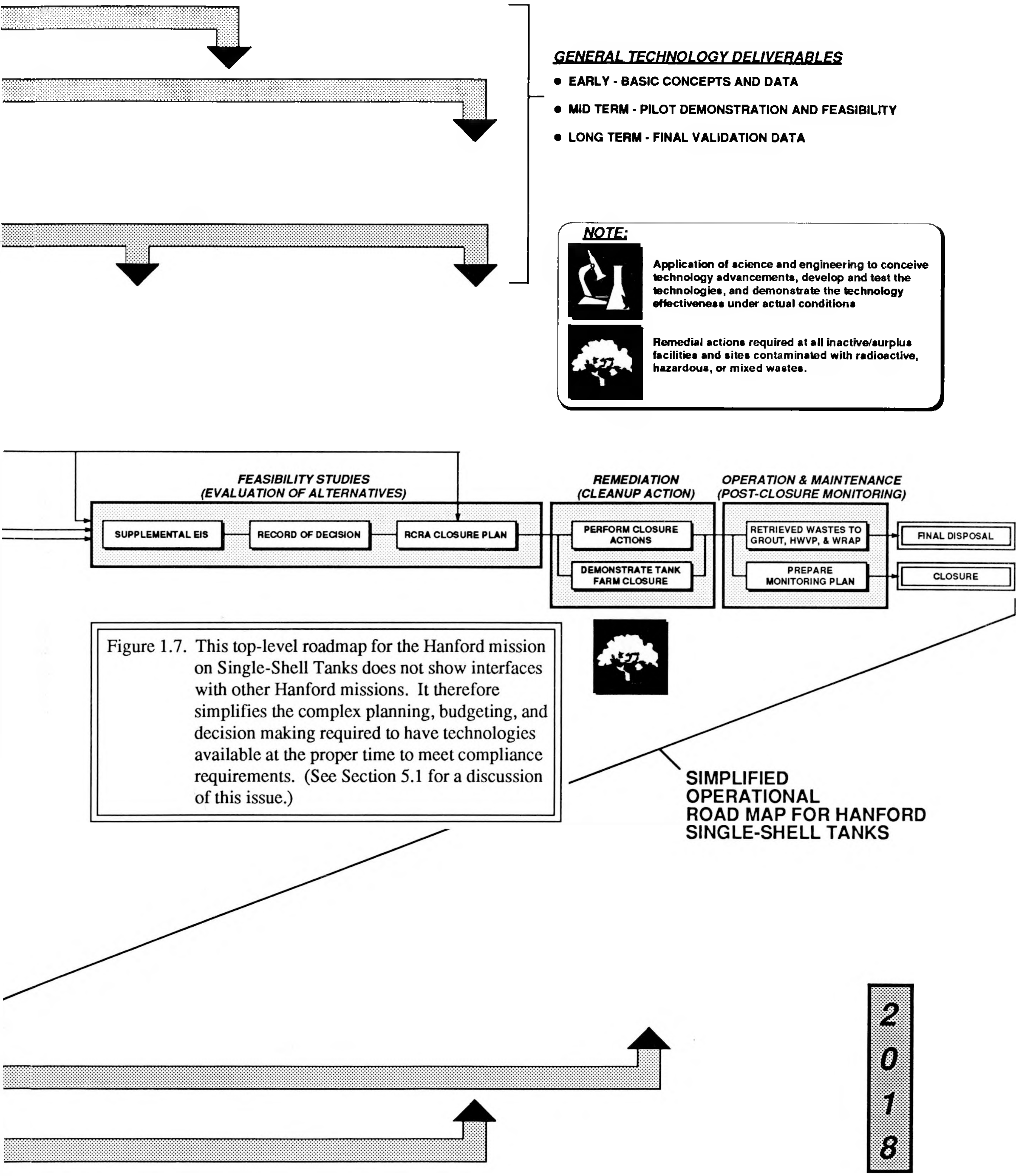


Figure 1.7. This top-level roadmap for the Hanford mission on Single-Shell Tanks does not show interfaces with other Hanford missions. It therefore simplifies the complex planning, budgeting, and decision making required to have technologies available at the proper time to meet compliance requirements.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

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.

<u>Summary of Differences Among the FY 1991-1995 Five-Year Plan, the Budget, and the Site-Specific Plan</u>: 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.

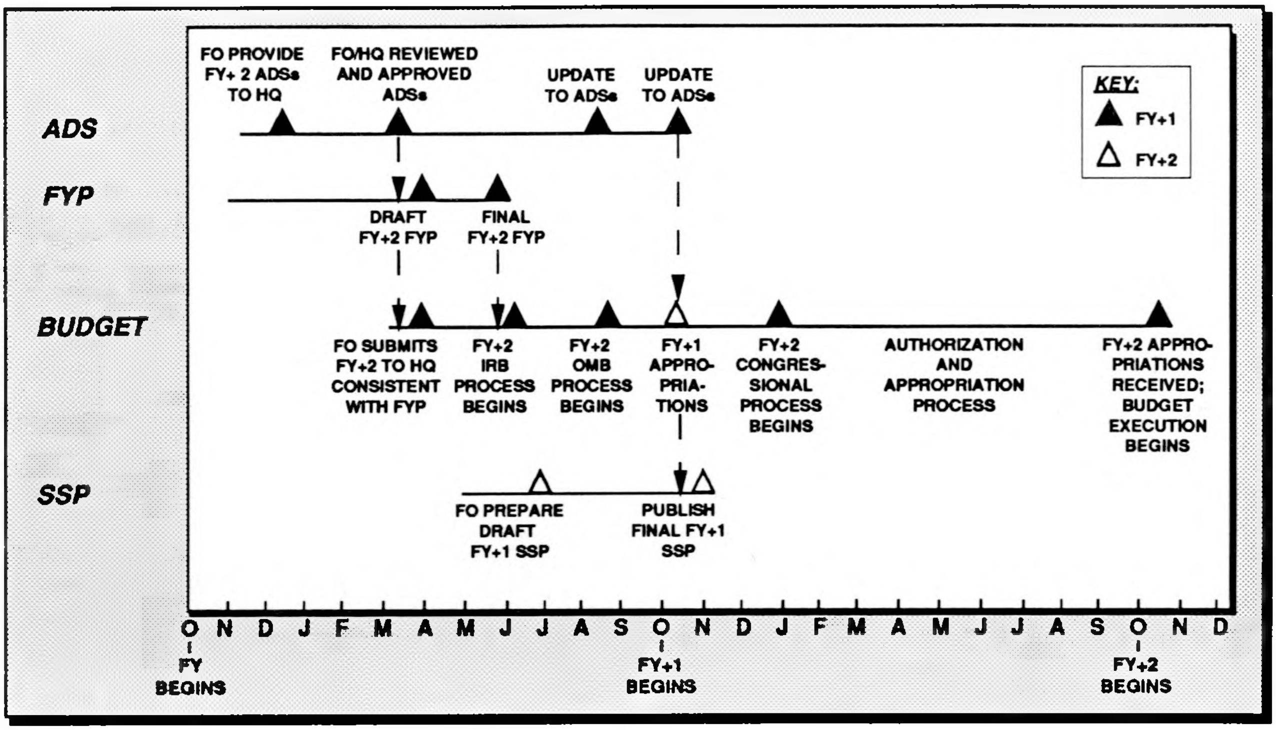


Figure 1.8a. The Five-Year Plan data feed into the Department's Federal budget process. (ADS = Activity Data Sheets, DOE = Department of Energy, FO = Field Office, FY = Fiscal Year, FYP = Five-Year Plan, HQ = Headquarters, IRB = Internal Review Budget, OMB = Office of Management and Budget, SSP = Site-Specific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

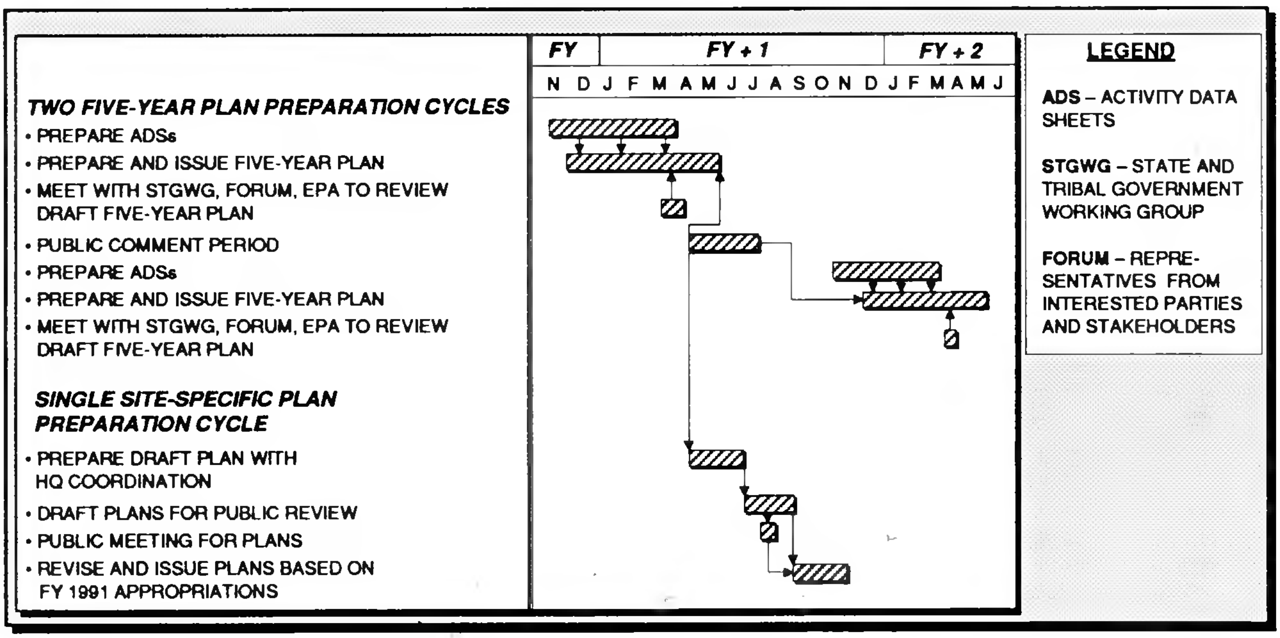


Figure 1.8b. An alternative portrayal of typical Five-Year Plan and Site-Specific Plan activities showing activities related to public participation. (ADS = Activity Data Sheets, EPA = Environmental Protection Agency, FORUM = Representatives from interested parties and stakeholders, HQ = Headquarters,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

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.

<u>DOE Action</u>: 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.

1.10 PREPARATION AND REVIEW OF SITE-SPECIFIC PLANS

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

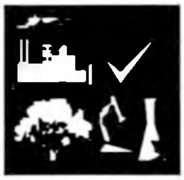
4.0 Waste Operations
4.1 OVERVIEW OF THE WASTE OPERATIONS PROGRAM
4.2 PROCESS FOR MANAGING AND IMPLEMENTING THE WASTE OPERATIONS PROGRAM
4.3 WASTE OPERATIONS PROGRAM ACTIVITY AND FUNDING SUMMARY FOR FY 1992-1997
4.3.1 Waste Operations—High-Level Waste Program
4.3.2 Waste Operations—Transuranic Waste 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.

1.11 DOE PROCESS FOR FUTURE FIVE-YEAR PLANNING



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.

<u>Link with Site-Specific Plans</u>: 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.

<u>Stakeholder Involvement</u>: 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.

<u>Policy</u>: 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).

<u>Corrective Activities</u>: 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.

<u>Environmental Restoration</u>: 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.

1.13 SUMMARY OF CHANGES FROM THE FY 1991-1995 FIVE-YEAR PLAN

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.

1.14 CHANGES IN DOE'S CULTURE: TOUGHER ON THE INSIDE

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.

<u>Tougher on the Inside</u>: 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.

<u>Decision to Prepare Programmatic Environmental Impact Statements (EISs)</u>: 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."

1.15 CHANGES IN DOE'S CULTURE: SOFTER ON THE OUTSIDE

"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 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 STGWG Participant: At an October 29, 1989, conference ("Department of Energy Defense Programs Restoration: Doing Good Business in A New Culture"), a STGWG 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 STGWG's endorsement of the Five-Year Plan. STGWG participants are and will remain independent voices, whether pro or con. DOE will remain receptive to STGWG 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.

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.

1.16 WASTE MINIMIZATION'S MULTIFACETED ROLE IN COMPLIANCE

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.

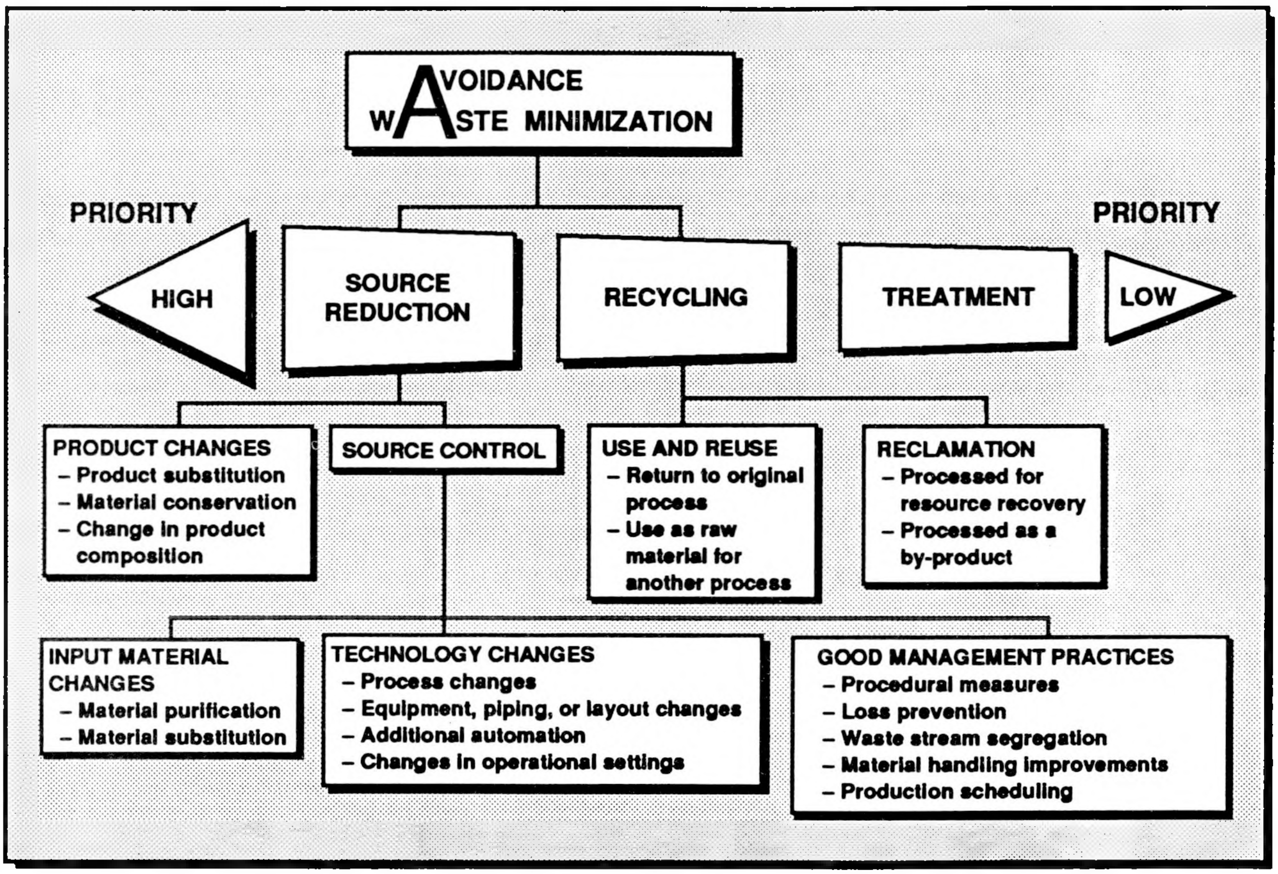


Figure 1.16. The Department of Energy waste minimization activities will emphasize those waste reduction measures that eliminate waste before it is generated. Wastes that cannot be eliminated by minimization techniques may be treated to reduce volumes or toxicity before disposal.

2.0

Corrective Activities

Activities necessary
to bring active and standby facilities
into compliance with
local, State, and Federal regulations.

2.1.1 SCOPE OF CORRECTIVE ACTIVITIES

DOE is out of compliance with a range of Federal, State, and local environmental requirements. Activities and projects required to bring DOE's active and standby facilities into compliance constitute Corrective Activities.

Corrective Activities are those activities needed to bring active and standby DOE facilities currently out of compliance with applicable local, State, and Federal requirements and internal DOE requirements into compliance in an expeditious manner. They span the range of media--air, water, and solids (i.e., waste)--as demonstrated in Figure 2.1.1. Also included as Corrective Activities are those projects and activities in which Operations Offices were able to identify specific cases in which DOE will be in noncompliance with near-term regulatory requirements.

Corrective Activities are intended to be discrete, focused efforts for achieving compliance. Maintaining compliance belongs to the appropriate Waste Operations or other programmatic activity (i.e., DOE intends to operate all of its facilities in compliance with the regulations). The major Federal regulatory drivers for Corrective Activities are the Clean Air Act, Clean Water Act, Resource Conservation and Recovery Act, Safe Drinking Water Act, and the Toxic Substances Control Act. Corrective Activities follow a life cycle consisting of identification, evaluation, funding, implementation, and closeout. Repetitive or routine activities or long-term programmatic efforts are considered outside the scope of Corrective Activities and belong to the appropriate operational organization. For example, routine monitoring in accordance with a compliance agreement is not a Corrective Activity, whereas establishing a monitoring system where none existed before can be a Corrective Activity if it is undertaken to eliminate an identified noncompliance situation.

Because DOE has recently expanded its site reviews and level of self assessment, the list of identified noncompliance conditions is growing as expected. Additionally, DOE is committed to supporting expanded monitoring and oversight by State and local regulatory authorities. As new noncompliances are identified by DOE or State and local authorities, the ability to respond to these challenges may not keep pace, primarily because of human resource and logistical constraints in defining and conducting all of the work simultaneously. Consequently, there is likely to be an initial increase in the backlog of Corrective Activities, which should be viewed as a positive indicator that the new proactive DOE culture is working and that problems are being brought to the forefront and disclosed publicly. As the number of newly identified deficiencies diminishes with time, the rate of work completion will overtake new items entering the plan, and the backlog will decline. This turning point is expected to occur in as soon as two to three years, given DOE's increasing level of effort to address these concerns.

Once properly classified, Corrective Activities remain as such until compliance is achieved. Some Corrective Activities from the FY 1991-1995 Plan would not be classified as such by current criteria. However, because of budget cycle lead times and constraints, these activities will be "grandfathered" through 1990 and 1991. Beginning in FY 1992, those activities that are operational or programmatic in nature have been recategorized accordingly [e.g., preparation of air pollution emission notices at the Rocky Flats Plant (ADS-RF-108)].

As discussed in Section 2.1.3, Corrective Activities are not managed as a separate DOE program by the Office of Environmental Restoration and Waste Management (EM), but rather, they are managed by the DOE program offices having responsibility for the activity [e.g., Defense Programs (DP), EM, Nuclear Energy (NE), and Energy Research (ER)]. EM will have responsibility for many Corrective Activities, primarily because of the large number of waste operational facilities under its jurisdiction. The other Operational Programs (NE, ER, DP) will manage Corrective Activities directly related to their facility responsibilities. To keep all interested parties informed and to ensure that high priority is given to Corrective Activities, the Five-Year Plan will continue to reflect the planning, budgeting, progress, and status of all Corrective Activities regardless of which program manages them.

Because Corrective Activities must be completed in a timely and effective manner to protect public health and safety and the environment, these activities will generally be accomplished by the application of existing technologies rather than new technologies that would require lead time for development. In some cases that require new facilities, every reasonable opportunity will be taken to incorporate the most modern, demonstrated, best available technology into the facility processes, especially if the facility is expected to operate for many years.

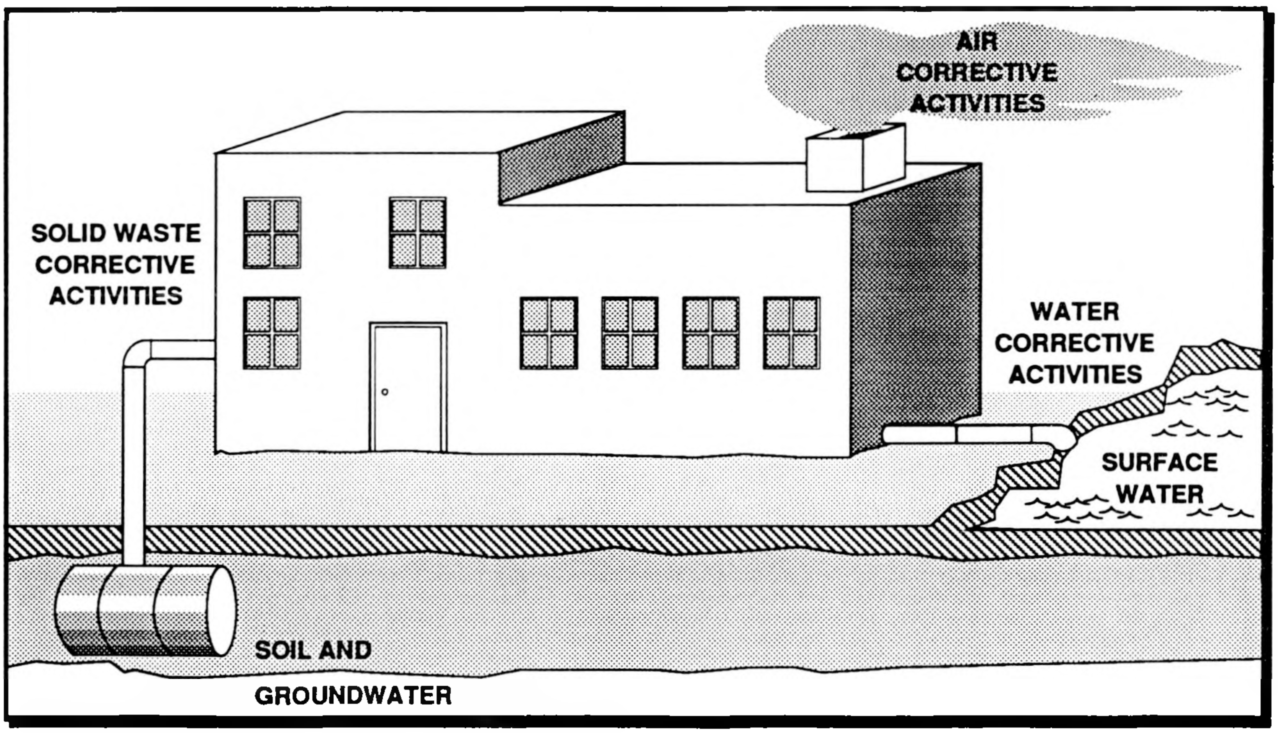


Figure 2.1.1. Corrective Activities cover the full range of environmental releases: (1) air, (2) surface water, and (3) solids and groundwater (solid waste).

2.1.2 GOAL OF CORRECTIVE ACTIVITIES

The primary goal for conducting Corrective Activities is to achieve compliance with applicable local, State, and Federal requirements and DOE Orders within an aggressive time frame. DOE has therefore placed the highest priority (Priority 1) on all of its Corrective Activities.

DOE is committed to correcting out-of-compliance conditions and maintaining compliance with applicable local, State, and Federal requirements (regulations, permits, consent orders, etc.), compliance orders, and DOE Orders.

Pursuant to State and Tribal Government Working Group comments received on the FY 1991-1995 Plan and in recognition of the essential nature of environmental regulatory compliance, the four-level priority scale applied to last year's Corrective Activities has been abandoned this year and replaced with a single priority, Priority 1. This change ensures that all out-of-compliance conditions are treated with the highest priority within the Five-Year Plan. Note that maintaining compliance is the primary objective of the technical program offices.

At the Stakeholder Forum, discussed in the Foreword and in Section 1.15, some of the attendees commented that DOE should reexamine the decision to place all Corrective Activities into Priority 1. They felt that this may have been an overreaction to the existence of a noncompliance situation, when there were not necessarily any adverse impacts associated with the condition being corrected.

Specific near-term program objectives can be found in the Corrective Activities site summaries in Attachment A. These can be used to measure DOE's progress in attaining the basic program goals of correcting noncompliance situations. Although planned for the schedules shown, some milestones may slip for various technical, regulatory, environmental, or fiscal reasons.

As an indication of DOE's commitment to achieving rapid compliance with requirements, the Plan estimates funding for Corrective Activities as follows:

- 1991 - $177 million
- 1992 - $178 million

The FY 1991 estimate represents a $42 million increase over the FY 1990 funding level. All such estimates are considered valid. (See Section 1.2.)

Support for Corrective Activities beyond FY 1992 is currently constrained by limited assessments and knowledge of the out-of-compliance conditions. The number and types of actions that must be accomplished in sequence (i.e., investigation, design, review by external agencies, public involvement, technology selection, etc.) further limits the accuracy of cost estimates beyond 1992.
Section 2.2, Summary of Corrective Activities Accomplishments Since the FY 1991-1995 Plan, provides information regarding the status relative to last year's goals.

Although the goal of this Plan is to achieve compliance within an aggressive time frame, several factors will strongly influence DOE's success. One of these is the number of Corrective Activities to be identified in the future. Figure 2.1.2 portrays the dominant influences affecting identification. Because of DOE's expanded self-assessments and a proactive culture focused on environmental restoration and compliance, it is expected that, during the next few years, newly identified noncompliance conditions will grow at a faster rate than the existing instances of noncompliance can be resolved. Thus, this will result in a near-term net increase in the number of open Corrective Activities. In the longer term, new regulatory requirements, particularly with retroactive provisions and, to a lesser extent, newly identified out-of-compliance conditions, will result in a reduced but continued level of Corrective Activities for the foreseeable future.

As DOE expands its efforts to aggressively pursue Corrective Activities, it recognizes a need to plan for managed growth in the level of effort to ensure that the work is performed right the first time and is coordinated with the affected Federal, State, and local authorities. Consistent with that objective, a functional organization within the Office of Environmental Restoration and Waste Management will coordinate DOE's Corrective Activities and ensure that steady progress toward environmentally sound operations is achieved. In coordination with the regulatory agencies, DOE will develop plans, select appropriate technologies, and implement schedules for completing the identified Corrective Activities. This process will provide appropriate opportunities for regulator involvement and review.

The Operations Office Site-Specific Plans contain schedules, milestones, and resource requirements for Corrective Activities.

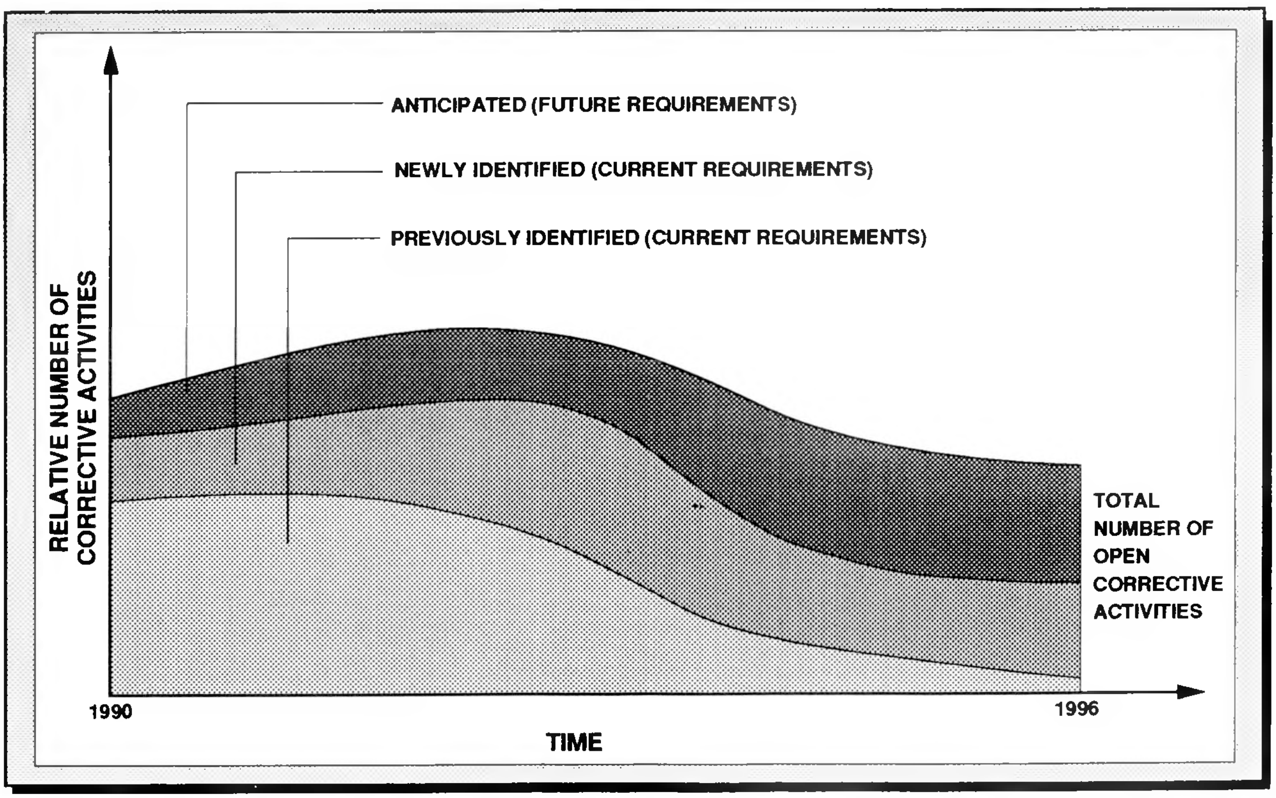


Figure 2.1.2. Changes in the components of the Corrective Activities backlog over time are shown.

2.1.3 DOE APPROACH TO MANAGING CORRECTIVE ACTIVITIES

DOE has adopted an interorganizational management process for Corrective Activities that ensures full line management accountability and provides for effective coordination across the various Program Secretarial Offices.

Corrective Activities are managed by the responsible DOE Program Secretarial Offices (Figure 2.1.3.a) to promote full accountability for operations associated with their respective facilities. The Office of Environmental Restoration and Waste Management, in addition to having the line management responsibility for its own facilities, is responsible for overseeing and coordinating all Departmental Corrective Activities, including the budget function. Day-to-day management, execution, and reporting are the responsibility of the appropriate DOE Operations Office for the facilities involved.

Corrective Activities are varied and designed to respond to requirements imposed by laws, regulations, negotiated agreements, DOE Orders, and other "contracts" by satisfying their requirements. The Corrective Activities may take such form as completed permits, facility design changes and modifications, and critical regulatory performance monitoring.

Consistent with Figure 2.1.3b, as existing regulations are applied and new ones are issued, compliance deficiencies are identified through various review processes, including Tiger Teams; environmental surveys; Headquarters, field office, and contractor audits; and audits conducted by the States and regulatory agencies.

Once a noncompliance is identified, action plans are developed for achieving compliance. These plans include actions related to permit development, technology assessment and direction, facility changes, proposed budgets, and schedules. Action plans are reviewed by the regulators, modified as appropriate by DOE, and approved as part of the yearly planning process. Short-term, low-cost actions are handled expeditiously through the base program operations and are not separately budgeted.

Responses to Corrective Activities are developed in consultation with regulatory agencies. In some cases these responses or action plans may be included in negotiated compliance agreements, such as a Federal Facility Compliance Agreement. Funding requirements for Corrective Activities are included in annual updates of this Plan and submitted as part of the annual DOE budget process. Upon receipt of funding, the Corrective Activities are implemented. If sufficient funding is not provided by Congress, DOE will submit a "supplemental" funding request to Congress, initiate discussion with regulators, and coordinate resources to evaluate possible alternative approaches.

In addition to public review processes required by environmental regulations, opportunities are provided for review by regulatory agencies, Indian Tribes, and interested citizens. Progress on completion of Corrective Activities will be documented in the annual Plan update.

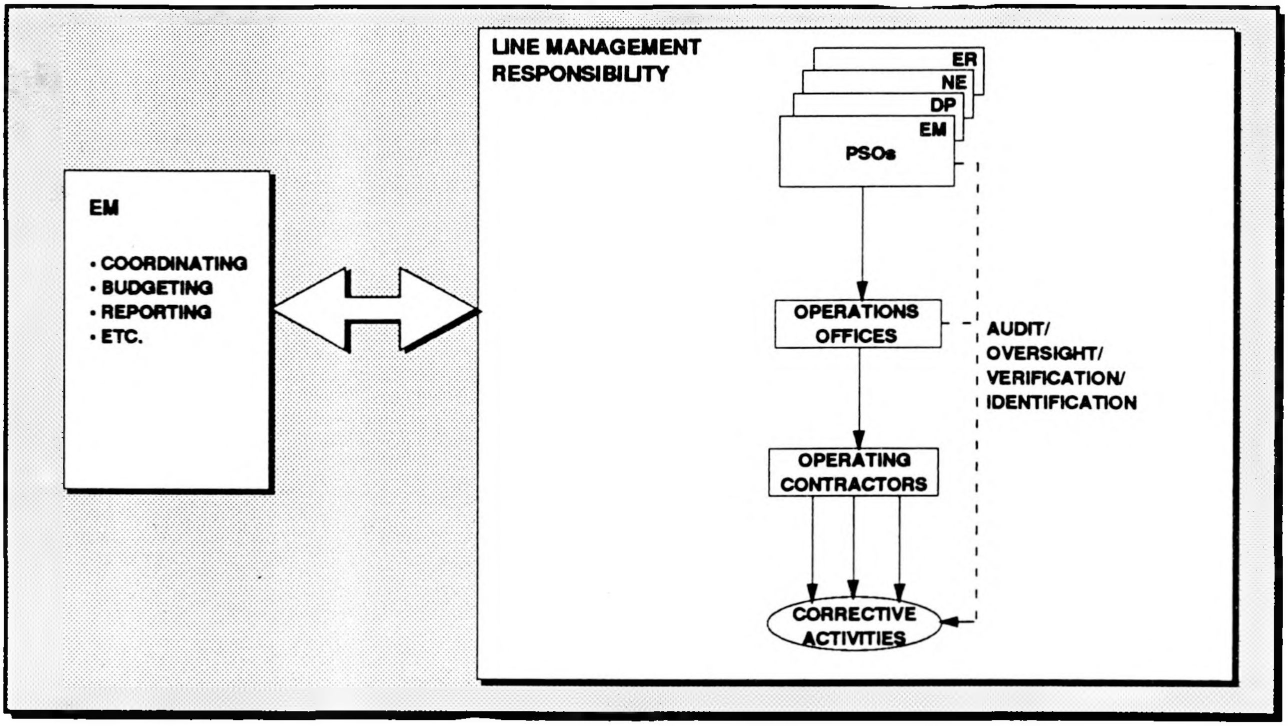


Figure 2.1.3a. The Department of Energy organizational structure for managing Corrective Activities promotes full line management accountability and provides for effective coordination across the various Program Secretarial Offices. (EM = Office of Environmental Restoration and Waste Management, DP = Defense Programs, NE = Nuclear Energy, ER = Energy Research, PSO = Program Secretarial Office)

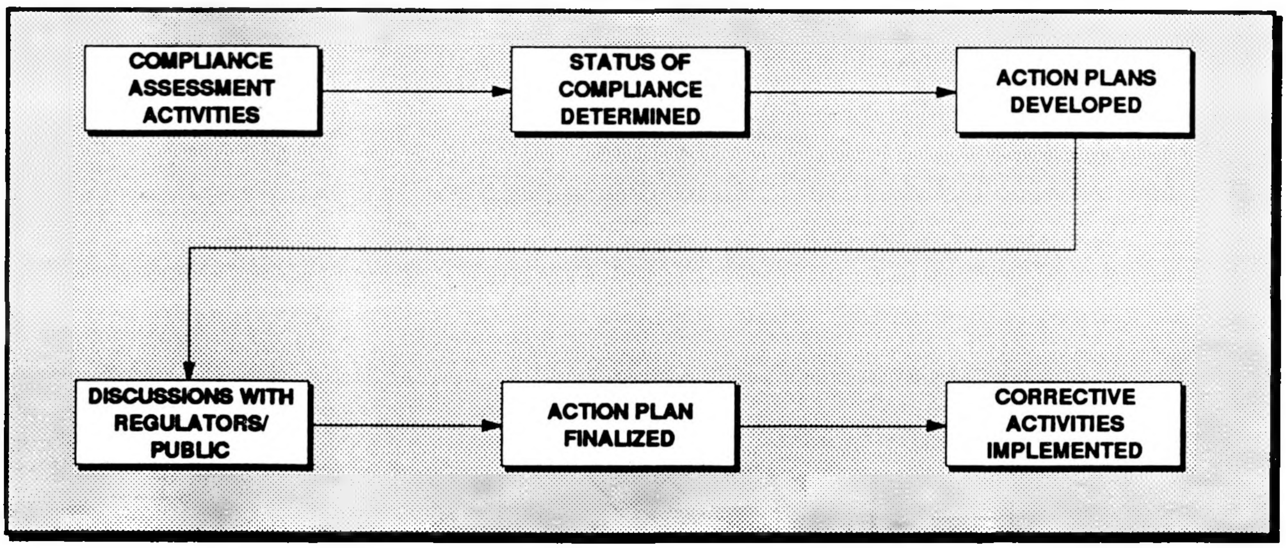


Figure 2.1.3b. The Department of Energy process for managing Corrective Activities involves analysis of regulations and compliance status, discussions with the regulatory agencies, and development of action plans and funding.

2.2 SUMMARY OF CORRECTIVE ACTIVITIES ACCOMPLISHMENTS SINCE THE FY 1991-1995 PLAN

DOE has met the majority of the Corrective Activities milestones set in the FY 1991-1995 Plan.

Some of the major Corrective Activities accomplishments made during FY 1989 and FY 1990 are as follows:

- Preliminary design and cost estimates prepared for construction of a sanitary sewer line; soil sampling and removal near underground fuel oil tanks initiated in 1989 at the Inhalation Toxicology Research Institute, Albuquerque.
- Radioactive Storage Upgrades and Phase 1 of Relining the 002 Main Sewer Trunk to control polychlorinated biphenyl (PCB) infiltration completed in 1989 at the Kansas City Plant.
- Construction completed during 1989 on the segregation of sanitary and radioactive wastewater at Technical Area (TA) 53 at Los Alamos National Laboratory.
- Design phase completed for new fuel oil storage tanks and a new potable water system at the Mound Plant.
- Design and construction of the Resource Conservation and Recovery Act (RCRA) Waste Staging Facility under way; procurement and installation of replacement waste treatment equipment for the high-explosive facilities in progress at the Pantex Plant.
- Title II design completed for Underground Storage Tank (UST) Removal/Replacement at Pinellas Plant.
- Sewer line design completed for TA III; construction in progress at Sandia National Laboratories-Albuquerque.
- Design specifications established for a Tritium Monitoring System at Sandia National Laboratories-Livermore.
- Conceptual Design Reports completed for repair/upgrade of laboratory and sanitary sewer collection systems and wastewater treatment facilities at Argonne National Laboratory-East (ANL-E), Chicago.
- Assessment and cleanup of pollutant spills and/or releases under way at ANL-E, Brookhaven National Laboratory (BNL), Fermi, and Argonne National Laboratory-West.
- Work under way to remove, replace, and upgrade USTs at BNL. Four tanks removed or abandoned in place in 1989 and two tanks replaced in 1990.
- Title II design of the Liquid Effluent Treatment and Disposal Facility complete with facility construction in progress; the Mixed Waste Implementation Program implemented; and the Idaho Chemical Processing Plant RCRA Part A Permit application filed at the Idaho National Engineering Laboratory.
- Preoperational testing of the nitric acid regeneration system successfully completed in September 1989 at the Oak Ridge Gaseous Diffusion Plant.
- National Pollutant Discharge Elimination System permit application

submitted in November 1989 at the Oak Ridge Y-12 Plant.

- Stormwater Retention Basin now in operation at the Feed Materials Production Center, Fernald.
- Engineering and design studies for PCB Control Improvements (gaskets) begun in 1989 at the Paducah Gaseous Diffusion Plant (PGDP) and the Portsmouth Gaseous Diffusion Plant (PORTS) and a conceptual design report completed at PGDP, while installation of a temporary PCB gasket trough begun at PORTS.
- Definitive design of a cathodic protection system for waste management facilities and a definitive design review of the Mixed Waste Storage Facilities completed at Richland.
- Part B Permits and/or Closure Plans submitted in accordance with the Tri-Party Agreement milestones (Richland).
- Functional Design Criteria approved for the Enclosed Material Handling Facility and for the Plutonium Finishing Plant Drum Storage Facility at Richland.
- Ambient samplers and air monitoring equipment purchased for Rocky Flats Plant (RFP).
- Revised Air Pollution Emission Notices (APENs) submitted for existing sources and new APENs submitted for Building 709 (RFP).
- Wastewater Treatment Unit installation and Title I and Title II Design of the UST Fuel System completed at Lawrence Berkeley Laboratory.
- Design of the sanitary sewer diversion system completed and five of nine satellite sanitary sewer stations operating at Lawrence Livermore National Laboratory.
- Contracts for building the K-Reactor Cooling Tower awarded, the conceptual design bids completed, and the site preparation contractor mobilized.

DOE is on track with its multiyear goals to achieve rapid closures of the Corrective Activities in an aggressive time frame. However, there has been a growth of Corrective Activities in certain areas because of new regulations and agreements. Most Corrective Activities are either already under way or are being included in upcoming compliance agreements, thus providing significant visibility to these activities. The compliance agreements sometimes establish schedules extending over several years to achieve compliance. These are acknowledged as aggressive, yet the participants recognize that elements of uncertainty, risk, characterization, and definition will occur during the execution phases of the Corrective Activities and will likely result in changes, primarily to the schedule. Therefore, the agreements provide "change clauses" whereby adjustments can be made by mutual consent.

2.3 CHANGES IN PLANNING FOR CORRECTIVE ACTIVITIES SINCE THE FY 1991-1995 PLAN

Three major changes to Corrective Activities will ensure that all previously and newly identified Corrective Activities receive priority attention and that the goals for Corrective Activities are met expeditiously.

First, in response to State and Tribal Government Working Group comments and in recognition of the essential nature of environmental regulatory compliance, all Corrective Activities are assigned a Priority 1. Figure 2.3 highlights this change. Adjustments were made last year in the planning of individual activities to reflect this level of emphasis. Similarly, all newly identified Corrective Activities in this planning cycle have been assigned Priority 1.

Second, DOE has initiated a proactive compliance review process, which identifies new Corrective Activities and increases the number of open items (i.e., active Corrective Activities) above and beyond the resource allocation and effort expended during 1989. This trend is expected to continue for several more years as in-depth evaluations are performed.

Third, improvements and refinements are being made to the preparation and review process for Activity Data Sheets submitted by the DOE Operations Offices. Recognizing that this is an evolving process, the intent of these changes is to ensure clearer delineation between Corrective Activities and activities associated with ongoing program operations (e.g., activities previously submitted under the Corrective Activity category that do not conform to the refined definition will be moved as appropriate). Because the budget process does not permit this type of correction for the current year and the following year, projects extending to 1992 and beyond have been split, and only the activities for FY 1992 and beyond have been transferred to their appropriate categories.

In addition to these three changes, this FY 1992-1996 Five-Year Plan includes Corrective Activities dealing with major changes to Federal requirements and the environmental requirements that continue to be introduced by many State and local governments. For example, more stringent limits and additional monitoring requirements have been established by the Federal government in 40 CFR 61 to control radionuclide air emissions. More stringent State and local requirements are being incorporated into the operating permits of DOE facilities, often without phase-in or grace periods, thus resulting in near-term noncompliances. Corrective Activities have been added to DOE's current planning cycle to accommodate this growth in regulation.

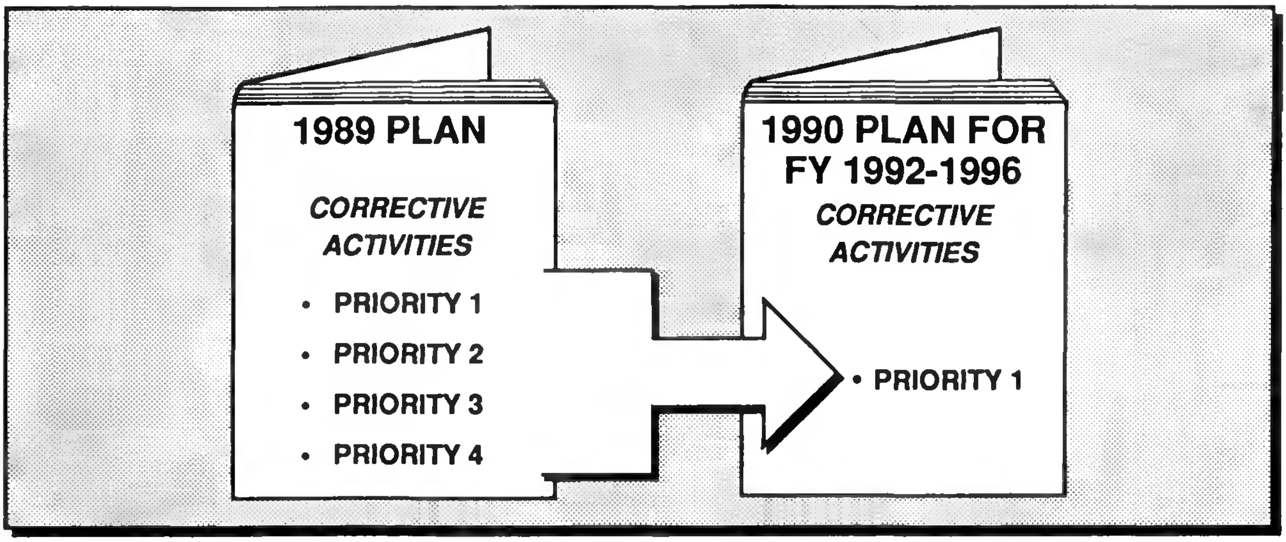


Figure 2.3. In this year's Plan, all Corrective Activities are assigned Priority 1.

2.4 OBSERVED TRENDS IN AND STATUS OF CORRECTIVE ACTIVITIES

The FY 1992-1996 Plan contains 149 Activity Data Sheets (ADSs) for Corrective Activities that identify actions that require significant resources (i.e., funding, time, and/or new facilities) over the next five years.

A total of 154 ADSs for Corrective Activities were submitted from the nine DOE Operations Offices. This is a decrease of 15 ADSs since the FY 1991-1995 Plan.

Figure 2.4a summarizes the number of ADSs submitted by the nine Operations Offices. Twenty-three of the ADSs pertain to air streams [e.g., emissions of uranium dust and volatile organic compounds (VOCs)]. Fifty-seven pertain to water streams (e.g., once-through cooling water and radionuclide traces in discharges). Seventy-four pertain to solids pollution (e.g., evaporation pond sediments and soil from crib disposal areas).

Funding distributions for Corrective Activities shown in Figure 2.4a indicate that the Albuquerque Operations Office and the Rocky Flats Office have the greatest number in the air category, Albuquerque and Oak Ridge have the greatest number in the water category, while the Albuquerque and Richland Operations Offices have the greatest number in the solid waste category. Figure 2.4b contains the distribution of the total funding for Corrective Activities, grouped by air, water, and solids. Figure 2.4c identifies the distribution of total funding for Corrective Activities by the managing Program Office.

The ADSs call for a total funding level of $869 million from FY 1990-1996. This funding level represents a five percent decrease from the FY 1991-1995 Plan and is driven by (1) progress on existing Corrective Activities, (2) a better analysis and characterization of the sites, and (3) improved methods and criteria for classifying activities so that valid Corrective Activities are separate from non-Corrective Activities. Funding levels increase from $132 million in FY 1990 to $177 million in FY 1992, leveling off to $54 million in FY 1996. Actions vary from one-time administrative and procedural changes requiring tens of thousands of dollars to major construction programs costing millions of dollars.

Some of the larger Corrective Activities identified in this Plan include:

- thermal mitigation and reuse of process cooling water associated with the Savannah River K-Reactor; actual foundation work has been initiated ($104 million); and
- multiple water quality improvements at the Feed Materials Production Center ($64 million).

Confidence levels associated with the funding estimates are generally high for the near term and moderate for the outyears. Consequently, all such estimates are considered valid. (See Section 1.2.) The associated decrease in confidence level in the outyears occurs because many Corrective Activities depend on the outcome of preliminary assessment and front-end project planning activities and agreements with regulatory agencies.

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	NUMBER OF CORRECTIVE ACTIVITIES				ESTIMATED COSTS FY 90-96 ($ In Millions)
	AIR	WATER	SOLIDS	TOTAL	
Albuquerque	5	14	20	39	114.8
Chicago	0	12	12	24	29.4
Idaho	0	0	7	7	42.8
Nevada	1	3	4	8	4.2
Oak Ridge	4	14	9	27	349.4
Richland	4	1	14	19	111.6
Rocky Flats	5	4	1	10	14.7
San Francisco	4	6	7	17	98.6
Savannah River	0	3	0	3	103.6
TOTAL	23	57	74	154	869.1

Figure 2.4a. The number of Corrective Activities and the associated estimated costs varies by Operations Office.

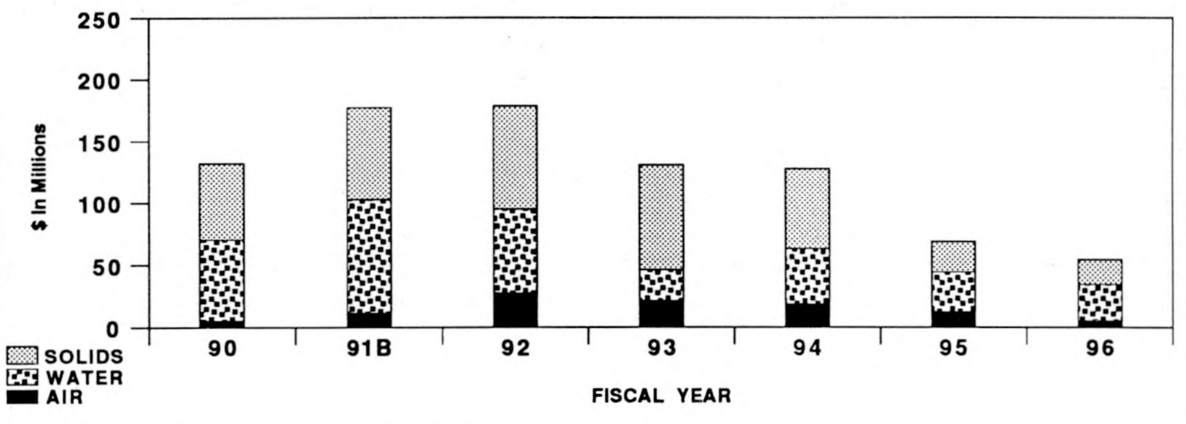


Figure 2.4b. Identified funding projections for Corrective Activities initially increase and then decrease as more activities are brought into compliance.

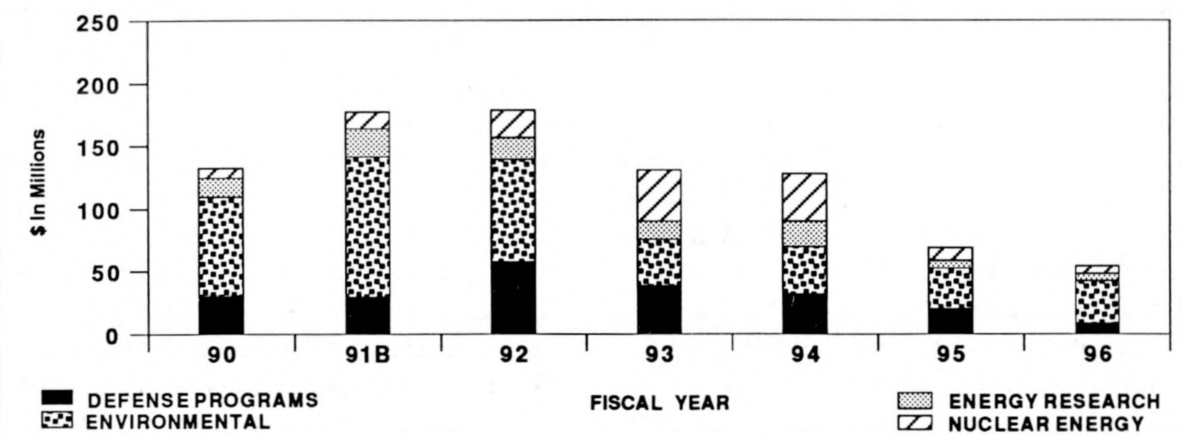


Figure 2.4c. Source of funding requirements for Corrective Activities has been identified by Department of Energy Program Office.

3.0

Environmental Restoration

The assessment and cleanup
of surplus facilities and inactive sites;
includes remedial actions and
decontamination and decommissioning.

3.1.1 ENVIRONMENTAL RESTORATION: BACKGROUND, SCOPE, REGULATORY REQUIREMENTS, CLEANUP STANDARDS, AND FUNDING

Past operations connected with DOE nuclear programs have resulted in contamination of a large number of sites and facilities with quantities of radioactive, hazardous, and mixed wastes. Environmental Restoration is concerned with assessment and cleanup of such sites and facilities to meet prescribed standards derived from Federal and State laws.

Background: Operations connected with DOE's nuclear complex involve the manufacture and processing of enriched uranium, the reprocessing of spent nuclear reactor fuel and other irradiated materials, production and testing of weapons, development of reactors, and various research activities. These operations, dating in some cases from the 1940s, generated and disposed of large quantities of radioactive and nonradioactive wastes. The history of operations shows the existence of spills of hazardous substances and waste management and disposal practices that, under today's regulatory structure and knowledge of the effects of chemicals in the environment, are unacceptable. The Department recognizes that many release sites must be cleaned up and that a large volume of wastes associated with these sites must be properly managed. DOE policy regarding these matters is in full compliance with the letter and spirit of applicable Federal, State, and local health, safety, and environmental statutes. To support this policy, DOE committed, in its FY 1991-1995 Environmental Restoration and Waste Management Five-Year Plan, to a goal of cleaning up its nuclear installations within 30 years. This FY 1992-1996 Five-Year Plan reaffirms this goal.

An essential element of this goal, Environmental Restoration, is concerned with all aspects of assessment and cleanup of facilities and sites that are no longer a part of active operations but are contaminated with various quantities of transuranic, low-level, hazardous, or mixed radioactive and hazardous waste materials. Such activities were first connected with the production of nuclear weapons and materials for national defense but have more recently included programs for the development of nuclear electric power sources and for carrying out basic nuclear research activities.

Scope: Environmental Restoration consists of two sets of activities: Remedial Actions and Decontamination and Decommissioning (D&D). The Remedial Actions tasks encompass (1) site discovery, preliminary assessment, and site inspection; (2) site characterization, analysis of cleanup alternatives, and selection of remedy; (3) cleanup and site closure; and (4) site compliance monitoring. Although Remedial Actions may deal with surface water contamination or with tanks, buildings, or structures, most Remedial Actions activities are concerned with contaminated soil and groundwater. The number of hazardous substance release sites is estimated to be approximately 3,700. In addition, more than 5,000 vicinity properties are connected with the Uranium Mill Tailings Remedial Action Project (UMTRAP).

D&D is concerned with the safe caretaking of surplus nuclear facilities and either their decontamination for reuse or their complete dismantling and removal. The D&D tasks encompass (1) surveillance and maintenance, (2) assessment and characterization, (3) environmental review, (4) engineering, (5) D&D operations, and (6) closeout. Although D&D activities may deal with soil and groundwater contamination, most D&D activities are concerned with facilities such as reactors, hot cells, processing plants, storage tanks, and other structures from which there have been no known releases. Approximately 500 contaminated facilities are included under D&D.

Key Regulatory Requirements: For Remedial Actions, the principal regulatory requirements are those derived from the provisions of the Resource Conservation and Recovery Act (RCRA); the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); the National Environmental Policy Act (NEPA); and the Uranium Mill Tailings Radiation Control Act (UMTRA) of 1978. Remedial Actions activities are further subject to important regulatory requirements imposed by various States. Other requirements are set forth in various DOE Orders, standards, and other guidance documents.

For D&D, activities are carried out in accordance with the provisions prescribed by NEPA and the Atomic Energy Act (AEA) and requirements set forth in various implementing DOE Orders, standards, and other guidance documents. For facilities from which there have been releases, or from which there is a potential for release, the provisions of CERCLA or RCRA also apply. State requirements are also applicable in certain instances.

Cleanup Standards: For the inactive facilities and sites connected with Environmental Restoration, technical cleanup standards are derived primarily from the provisions of CERCLA Section 121, "Cleanup Standards." Codified by the Environmental Protection Agency (EPA) in 40 CFR 300, Subpart F, such provisions establish general criteria for selecting remedial actions and require compliance with standards from other environmental statutes (such as the Toxic Substances Control Act, Safe Drinking Water Act, Clean Air Act, and Clean Water Act) to the extent the standards prescribed under such other statutes are applicable or relevant and appropriate. Risk assessment techniques may also be used in establishing standards as a means of ensuring safe cleanup levels. State standards may be substituted for Federal standards if a State imposes requirements that are more stringent than Federal standards. CERCLA Section 121(d) identifies the circumstances for use of State standards.

For facilities and sites cleaned up under RCRA, the standards applied are derived in a manner similar to that used under CERCLA; that is, standards from other environmental statutes are used and risk assessment techniques employed. RCRA requirements are codified by EPA, principally in 40 CFR 264, or, in the event a site may be closed under interim status, in 40 CFR 265. Under RCRA, States authorized to administer their own compliance programs may substitute State standards in lieu of Federal standards provided the State standards are at least as stringent as the Federal standards.

For sites being cleaned up under UMTRA, Project Cleanup Standards are codified by EPA in 40 CFR 192.

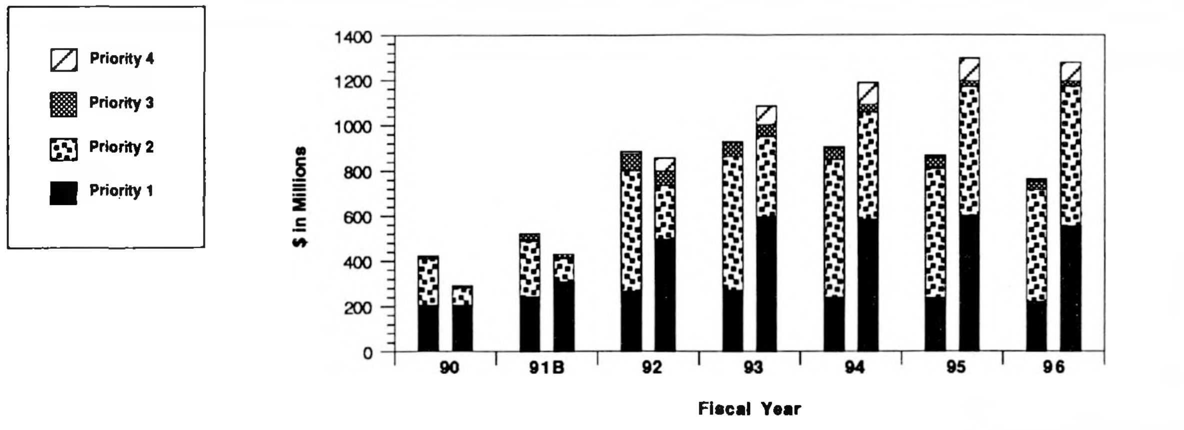
Funding Summary: Figure 3.1.1a sets forth estimated funding for assessment and cleanup according to priority category.

The amounts for FY 1990 are those currently appropriated by the Congress plus those pending authorization for reprogramming. Those for FY 1991 correspond to the President's budget currently before the Congress. Amounts for FY 1992-1996 include both validated and unvalidated amounts (see Section 1.2) and are projected requirements using the amounts in the FY 1990 budget appropriation and reprogramming requests and the FY 1991 budget request as a baseline. Figure 3.1.1b sets forth the allocation of such funding to Operations Offices, the Rocky Flats Office, and Headquarters.

The amounts set forth in Figures 3.1.1a and 3.1.1b are allocated according to the two major sets of activities in Environmental Restoration: Remedial Actions and D&D. Within Remedial Actions, funding is further allocated among three major subsets of activities: (1) the Formerly Utilized Sites Remedial Actions Program (FUSRAP), (2) UMTRAP, and (3) all other remedial actions at Departmental facilities and sites. Figures 3.1.1c, 3.1.1d, and 3.1.1e indicate the amounts of Remedial Actions funding allocated to FUSRAP, UMTRAP, and other remedial actions, respectively. Finally, Figure 3.1.1f indicates the amounts allocated to D&D.

For the period FY 1992-1996, the approximate total amount of funds associated with each priority level is, respectively, (1) \$4.07 billion, (2) \$5.05 billion, (3) \$0.47 billion, and (4) \$0.45 billion. The total for this period is \$10.04 billion.

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.)



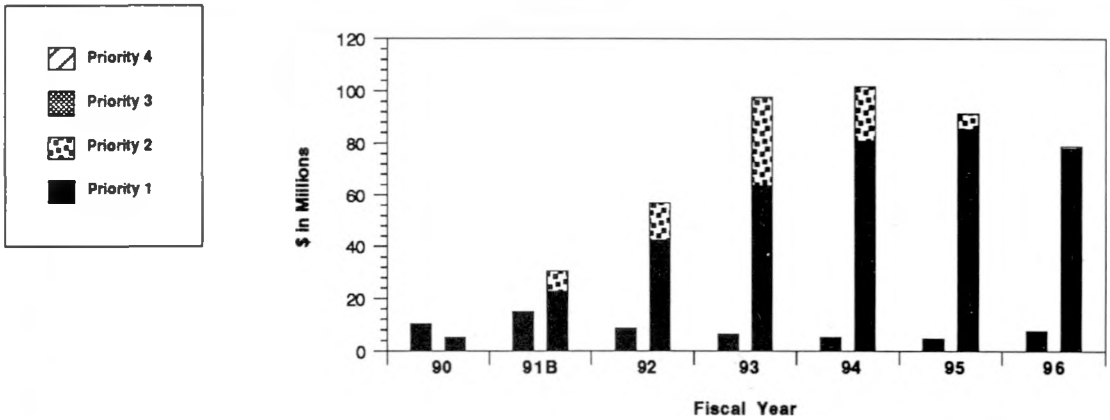
Totals							
Fiscal Year	90	91B	92	93	94	95	96
Assessment	424.6	521.1	883.0	927.0	904.8	866.6	763.8
Cleanup	290.6	428.7	854.4	1,082.9	1,186.2	1,294.5	1,276.6
$ in Millions	715.2	949.8	1,737.4	2,009.9	2,091.0	2,161.1	2,040.4

Figure 3.1.1a. Environmental Restoration funding and estimated costs are allocated assessment and cleanup needs according to four categories of priority.

	Fiscal Year ($ in Millions)						
OFFICE	1990	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
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
Headquarters	45.0	59.3	57.7	56.2	55.4	57.3	59.4
TOTAL	715.2	949.8	1,737.4	2,009.9	2,091.0	2,161.1	2,040.4

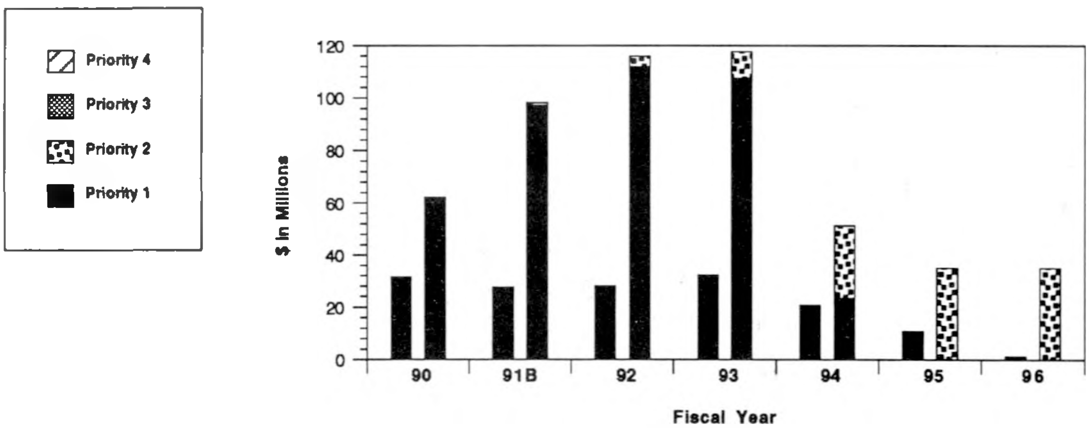
Figure 3.1.1b. Environmental Restoration funding and estimated costs are allocated among eight Operations Offices, the Rocky Flats Office, and Department of Energy Headquarters.

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.)



Totals							
Fiscal Year	90	91B	92	93	94	95	96
Assessment	10.3	15.0	8.4	6.3	5.2	4.6	7.6
Cleanup	5.1	30.6	57.1	97.6	101.7	91.3	78.8
$ in Millions	15.4	45.6	65.5	103.9	106.9	95.9	86.4

Figure 3.1.1c. Environmental Restoration funding and estimated costs are allocated to assessment and cleanup needs according to four categories of priority for the Formerly Utilized Sites Remedial Action Program.



Totals							
Fiscal Year	90	91B	92	93	94	95	96
Assessment	31.6	27.5	28.0	32.4	20.6	10.8	1.5
Cleanup	62.1	98.3	115.9	117.6	51.3	35.0	35.0
$ in Millions	93.7	125.8	143.9	150.0	71.9	45.8	36.5

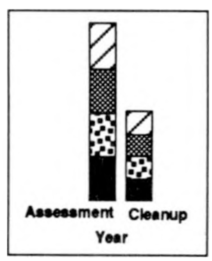
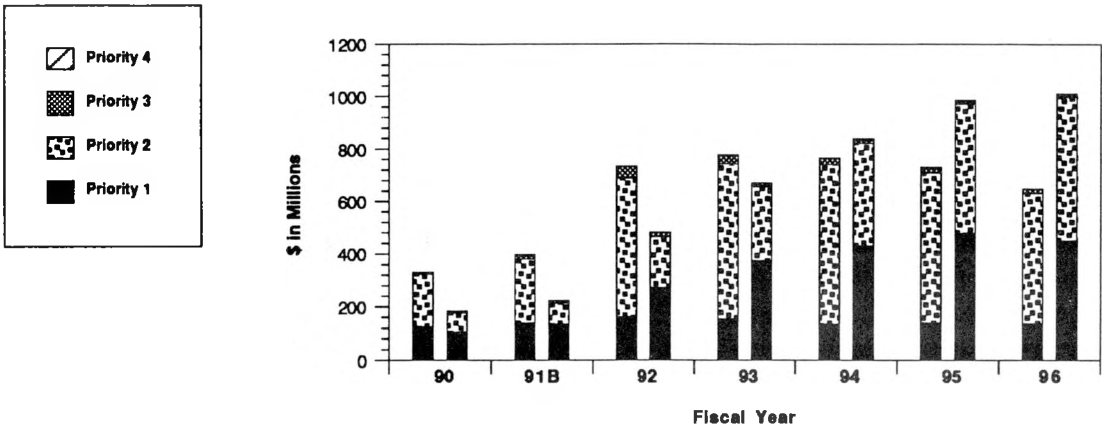


Figure 3.1.1d. Environmental Restoration funding and estimated costs are allocated to assessment and cleanup needs according to four categories of priority for the Uranium Mill Tailings Remedial Action Project.

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.)



Totals							
Fiscal Year	90	91B	92	93	94	95	96
Assessment	330.3	395.8	731.7	777.4	767.4	730.4	648.0
Cleanup	183.2	222.5	478.8	669.7	837.0	984.9	1,008.2
$ in Millions	513.5	618.3	1,210.5	1,447.1	1,604.4	1,715.3	1,656.2

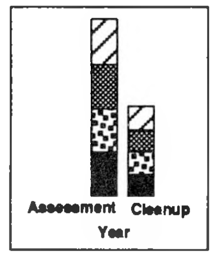
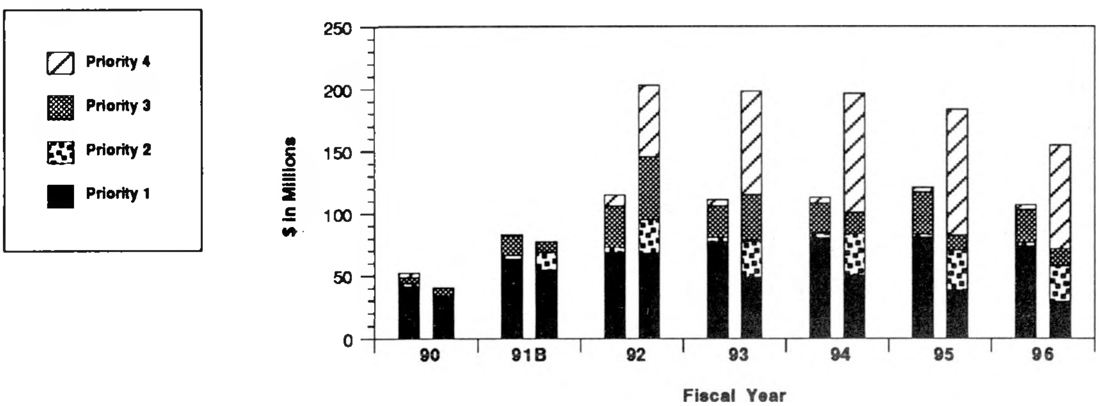


Figure 3.1.1e. Environmental Restoration funding and estimated costs are allocated to assessment and cleanup needs according to four categories of priority for remedial actions at Departmental facilities and sites.



Totals							
Fiscal Year	90	91B	92	93	94	95	96
Assessment	52.4	82.8	114.9	111.0	111.6	120.8	106.7
Cleanup	40.2	77.3	202.6	197.9	196.2	183.3	154.6
$ in Millions	92.6	160.1	317.5	308.9	307.8	304.1	261.3

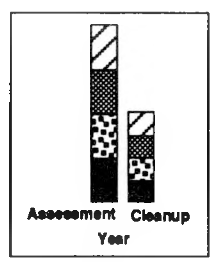


Figure 3.1.1f. Environmental Restoration funding and estimated costs are allocated to assessment and cleanup needs according to four categories of priority for Decontamination and Decommissioning activities.

3.1.2 ENVIRONMENTAL RESTORATION GOAL, STRATEGY, NEAR-TERM APPROACH, INCLUDING THE ROLE OF TECHNOLOGY DEVELOPMENT

The goal for all Environmental Restoration activities is to ensure that risks to the environment and to human health and safety posed by inactive and surplus facilities and sites are either eliminated or reduced to prescribed, safe levels. A near-term bias for action and a program of technology development directed toward Environmental Restoration needs are essential elements of the strategy for obtaining this goal and reaching DOE's overall goal of cleanup by the year 2019.

Environmental Restoration Goal: The fundamental goal for Environmental Restoration is to ensure that risks to the environment and to human health and safety posed by inactive and surplus facilities and sites contaminated by radioactive, hazardous, or mixed wastes are either eliminated or reduced to prescribed, safe levels. It is a cornerstone of DOE's overall goal to clean up its nuclear complex by the year 2019. Although encompassing all requirements prescribed by applicable Federal, State, and local environmental statutes and regulatory requirements, this goal is not limited to regulatory compliance; that is, protection of human health and safety is of paramount concern to DOE. This goal is supported by a continuing program of essential technology development intended to provide improved techniques for more effectively and economically dealing with contamination problems.

DOE generally intends that facilities and sites be returned to a condition suitable for unrestricted use; however, in certain instances, in-place remedies, such as stabilization followed by appropriate monitoring, may be a preferred alternative. Under certain circumstances, in-place remedies may offer advantages by (1) avoiding transportation risks and the potential for public exposure, (2) reducing risks associated with the handling of radioactive and hazardous materials, and (3) avoiding the need to develop new disposal facilities and sites. However, selection of in-place remedies will require regulatory approval and depend on (1) specific site conditions; (2) the type, nature, extent, and amount of contaminants present; (3) the availability of suitable stabilization technologies; (4) regulatory factors; or (5) other agreed to considerations as may result from the remediation or public interaction processes.

Strategy: The overall strategy for achieving the cleanup goal is defined by separate sets of objectives established in connection with remedial actions and decontamination and decommissioning. With respect to remedial actions, the objectives are to (1) identify inactive, contaminated nuclear facilities and sites; (2) assess these facilities and sites to determine the nature and extent of contamination; (3) confine and contain existing contamination to the extent necessary for minimizing its further spread; (4) provide for negotiated agreements with regulatory authorities defining the requirements and achievable schedule for the cleanup of these facilities and sites; (5) ensure that cleanup is carried out in strict accordance with these agreements; and (6) undertake long-term monitoring to ensure continuing compliance.

The objectives associated with decontamination and decommissioning are to (1) maintain facilities awaiting either decontamination or decommissioning in a manner that limits worker, public, and environmental exposure to potential hazards; (2) assess such facilities to determine the nature and extent of contamination; (3) decontaminate facilities designated for reuse in compliance with approved health and safety standards; and (4) decommission all other facilities in accordance with the requirements set forth in an approved environmental compliance plan.

Near-Term Approach: Although it is believed the strategy prescribed for Environmental Restoration provides a sound approach to carrying out the program set forth in this Plan, uncertainties unassociated with the implementation of this strategy have the potential for a significant adverse impact on carrying out Environmental Restoration activities. These uncertainties revolve around the broad issues connected with (1) the degree of assessment required before start of cleanup, (2) the potential for further environmental degradation that can result from assessment activities, (3) the lack of industrial laboratory capacity to support the sample analyses required as a result of the assessment process, and (4) the lack of industrial capacity to clean up the widely varying range of contaminants and conditions posed by DOE's sites and facilities.

Given such uncertainties, it is clear that Environmental Restoration activities cannot be conducted at the levels requested by the various Operations Offices and reflected in this Plan. Even if unlimited funds were available, DOE has neither sufficient expert staff, nor the Nation enough analytical and industrial capacity and qualified engineering, scientific, and other technical personnel, to take on a full-scale effort at all sites simultaneously. For the moment, the program can pursue either complete cleanup at some sites or incremental cleanup at many sites but cannot accommodate both simultaneously. Consequently, Environmental Restoration must be based on overall capability to support effectively the goal and objectives of the program. The near-term approach to be adopted for Environmental Restoration is built around the concept of a "bias for action"; that is, do sufficient assessment to determine if there is a near-term risk to human health and safety or the environment; if a risk exists, then immediately undertake sufficient cleanup action to abate the near-term threat; if no risk exists, 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.

This approach, the basic elements of which were set forth by the Environmental Protection Agency in connection with Superfund[1], makes it possible to attack the highest risks first, removing the sources of immediate threat in a logical and systematic manner, and then to turn to remaining long-term contamination according to a priority basis. This approach (1) allows the capacity of the system to grow while dealing with near-term risks, (2) provides

[1]Reilly, William K., "A Management Review of the Superfund Program." U.S. EPA, Washington, D.C.

time for development of new, cost-effective technologies for dealing better with remaining cleanup needs, and (3) ensures that scarce resources, both human and financial, are targeted at real, present problems while avoiding their expenditure on less immediate needs.

Technology Development: Integral to the strategy for Environmental Restoration, the role for technology development is to provide an improved technical and economic basis for the assessment and cleanup of contaminated facilities and sites. Efforts will address development of new technologies as well as adaptation of technologies not previously considered for application to this field. The scope of technology development for Environmental Restoration will include development of improved methods for (1) site identification, (2) facility and site characterization, (3) risk management and technology assessment, (4) interim confinement, (5) cleanup techniques, (6) waste minimization, and (7) compliance monitoring. A successful technology development program is expected to result in greater capability for (1) bringing facilities and sites into regulatory compliance, (2) minimizing the need for continuing cleanup activities at facilities and sites by providing permanent remedies, (3) minimizing the quantity of radioactive and hazardous material generated from cleanup operations, and (4) releasing restored sites to unrestricted use. In addition, such a successful technology development program would enhance the Environmental Restoration program by providing techniques to accomplish site assessment and cleanup more rapidly and in a more economical manner than anticipated to be possible with current technologies.

3.1.3.1 DOE APPROACH TO MANAGING ENVIRONMENTAL RESTORATION

The process for managing Environmental Restoration is characterized by control of activities against approved technical, schedule, and cost baselines derived from the five-year planning process.

The Environmental Restoration and Waste Management Five-Year Plan is the approved planning basis for all activities connected with the management, cleanup, and disposal of the radioactive, hazardous, and mixed wastes resulting from DOE's past and present nuclear operations. Based on the requirements set forth in the Plan, more detailed Environmental Restoration and Waste Management Site-Specific Plans are being prepared in connection with each of DOE's installations and field programs. All departmental planning concerning activities for dealing with such wastes is derived from, and is required to be consistent with, these two categories of plans.

With respect to Environmental Restoration, a major purpose of such planning is to establish for each project or activity in the program baselines for use as approved standards against which accomplishments, progress, and expenditures are measured and the program controlled. These baselines each consist of three constituent element baselines: (1) a technical element of the baseline that specifies the nature, extent, content, technology, and sequence of authorized activities; (2) a schedule element of the baseline that sets forth the timing of such activities; and (3) a cost element of the baseline that sets forth the approved funding schedule for the amounts estimated as needed to pay for such activities. The overall program baseline consists of a hierarchy of baselines, of which each successively lower tier corresponds to a more detailed plan for approved work. Although described in separate terms, technical, schedule, and cost baselines are not discrete, but fully interrelated and integrated components of a larger composite.

Management of Environmental Restoration activities is exercised through control of baselines at the various tiers of the planning hierarchy. With respect to DOE Headquarters' control of program activities, the process is characterized by (1) preparation and approval of the Five-Year and Site-Specific Plans, (2) formal baseline identification and approval, (3) specification of allowed variances from the approved baseline, (4) regular reporting and assessment of status against the approved baseline, and (5) corrective management action (which may include baseline revision through a formal change control process) in the event a variance exceeds the specified threshold. This concept is summarized in Figure 3.1.3.1. The process is supported by formal approval of baseline revisions and documentation control.

The requirements against which Environmental Restoration baselines are developed are, in general, prescribed by (1) environmental, safety, and health needs; (2) Federal, State, and local statutes and regulatory requirements; (3) provisions of the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental

Response, Compensation, and Liability Act (CERCLA) agreements, permits, and orders; (4) DOE and Administration policy; and (5) approved budgets and budgetary constraints. All baselines must be consistent with the approved planning basis set forth in the approved Five-Year and Site-Specific Plans.

Environmental Restoration baselines become more detailed and precise as program activities progress. They are typically established separately for activities associated with assessment and with cleanup. With respect to any given site or facility, the baseline for assessment activities initially is a preliminary estimate of proposed work that is based on data derived from available records and reports, site visits, sampling activities, and analysis (i.e., as a result of the preliminary assessment and inspection phases of the environmental restoration process). This baseline is adjusted on the basis of regulatory approval of the remedial investigation or RCRA Facility Investigation work plan. A baseline for cleanup activities will be established at the conclusion of the characterization and evaluation of cleanup alternatives phases. A final baseline will be established following the Record of Decision (CERCLA) or Corrective Action Decision (RCRA) at the conclusion of remedial design just before the cleanup action phase. This baseline incorporates the detailed costs, schedules, engineering plans, designs, site specifications, and all site-specific factors upon which actual cleanup work will be based.

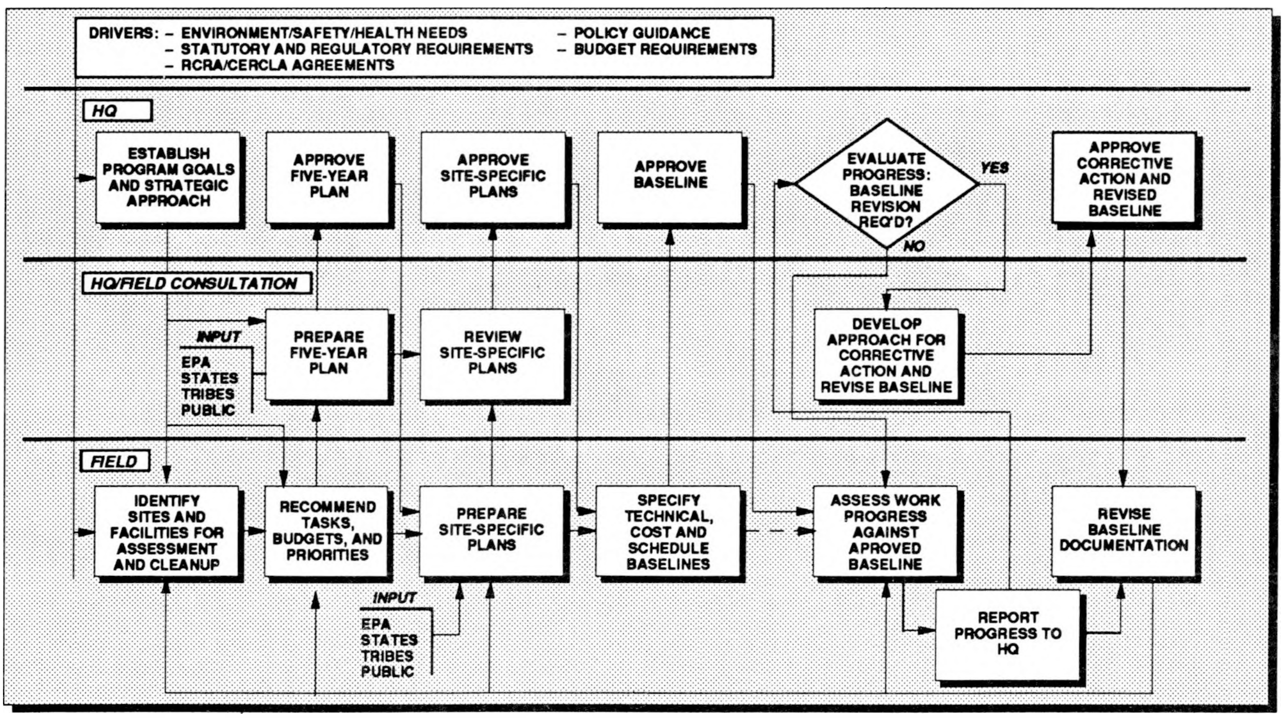


Figure 3.1.3.1. Five-Year and Site-Specific Plans are integral components of the baseline management concept used for Environmental Restoration. (HQ = Headquarters, EPA = Environmental Protection Agency)

3.1.3.2 IMPLEMENTING ENVIRONMENTAL RESTORATION ACTIVITIES

DOE seeks to improve efficiency and performance in planning and carrying out Environmental Restoration activities by (1) promoting a more streamlined process for establishing regulatory requirements and authorities through use of three-party agreements and (2) using remediation contractors competitively selected on the basis of prescribed qualification standards.

Agreements for Cleanup: The principal requirements for Environmental Restoration cleanup activities are derived either from (1) the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); (2) the Resource Conservation and Recovery Act (RCRA) Sections 3004(u), 3004(v), and 3008(h); or (3) State and local laws. Furthermore, it is DOE's policy that activities carried out in accordance with these requirements must also comply with the National Environmental Policy Act (NEPA). To minimize delay and duplication of effort, the procedural, documentational, and public participation requirements of CERCLA or RCRA are supplemented to the extent necessary to ensure compliance with NEPA requirements.

With respect to any specific DOE installation, cleanup requirements will generally be set forth in agreements negotiated with the Environmental Protection Agency (EPA) or involved State. Such agreements may take various forms such as a consent order, a consent decree, an operating permit, or a tri-party Interagency Agreement (a.k.a., Federal Facility Agreement). Most Federal installations have inactive facilities or sites that may be subject to the jurisdiction of more than one regulatory authority. This measurably increases the complexity of the regulatory process and the uncertainty associated with the criteria by which the various regulatory requirements are imposed under the various agreements that may be in force. Such complexity and uncertainty make it difficult to define the most effective actions to meet fully all regulatory requirements.

To streamline the regulatory process while at the same time fully accommodate the requirements of the various applicable statutes and regulatory jurisdictions, DOE seeks, to the extent possible, to negotiate a single, comprehensive, three-party agreement with EPA and the involved State with respect to a specific installation. Such agreements are intended to establish technical requirements and schedules for cleanup and to delineate the roles and responsibilities of each party to the agreement. (For National Priorities List sites, such an agreement is termed a tri-party Interagency Agreement, previously called a Federal Facility Agreement, and DOE has, in consultation with EPA, developed model provisions for use as a baseline to negotiations.) The scope of such agreements sets forth the requirements and schedule for cleanup and satisfies the statutory requirements in Section 120 of CERCLA for an interagency agreement. It may also include assessment activities. Of particular importance is that each tri-party Interagency Agreement will also identify the regulatory authority, Federal or State, empowered to administer specific provisions contained therein. The Hanford "Tri-Party Agreement" with

DOE, EPA, and the State of Washington as signatories is an example of a tri-party Interagency Agreement. DOE intends to continue pursuing three-party agreements as the most efficient basis for reconciling multiple regulatory requirements and for prescribing assessment and cleanup activities for all Environmental Restoration facilities and sites.

Remediation Contractors: With respect to Environmental Restoration activities, DOE intends to develop a more efficient contracting methodology. One approach under consideration would involve the use of industrial concerns, competitively selected by individual Operations Offices on the basis of their qualifications to carry out various aspects of Environmental Restoration activities for which the Operations Office is responsible. Competing firms would be required to demonstrate certain prescribed standards of qualification to be eligible for selection as a Remediation Contractor. Firms may qualify and be selected for more than one work area.

To ensure that Operations Offices develop consistent standards for qualification and selection, such standards would be developed in close consultation with DOE Headquarters. The purpose of this approach would be to (1) provide for uniform approved contractor qualification and selection standards, (2) ensure that only the most capable concerns are awarded work, and (3) promote high cost benefit and performance through contractor competition. Incentive to perform well is promoted through (1) the award in each work area of multiple contracts having an aggregate value in excess of needed work and (2) provisions for award determinations built into a contractor's fee structure. Poor performance results in replacement by another firm or in award of lower fees. The scope of work remediation contractors would be eligible to perform could encompass (1) project management, (2) planning and design of assessment and cleanup actions, (3) assessment and cleanup work, and (4) other technical and management assistance connected with Environmental Restoration. However, it is likely no one firm would be awarded work in all areas. Contractors would also oversee subcontractors performing all or portions of such work.

An incumbent Management and Operating (M&O) contractor or an M&O subcontractor could support onsite work being carried out by a remediation contractor by collecting and providing data and information, providing laboratory services, and preparing secondary documentation connected with site assessment and cleanup to the extent such services are authorized, managed, and approved by the responsible DOE Operations or Installation Site Office after consultation with DOE Headquarters. The potential role of M&O contractors in this regard is under review as part of consideration of the remediation contractor concept.

3.2 SUMMARY OF ENVIRONMENTAL RESTORATION ACCOMPLISHMENTS SINCE THE FY 1991-1995 PLAN

Every DOE field site made progress toward Environmental Restoration since the FY 1991-1995 Plan.

The Environmental Restoration Program made measurable progress during FY 1989 in site characterization, closure plans preparation, site remediation, and decontamination and decommissioning activities. The FY 1991-1995 Plan implied that progress would be measured in this FY 1992-1996 Plan. In many cases, this determination is possible by comparing commitments made last year with accomplishments noted this year. In other cases, progress cannot be measured so simply for two reasons: (1) the FY 1991-1995 Plan did not establish a definite Environmental Restoration program baseline for tracking measurable progress and (2) the early stages of Environmental Restoration program activities are difficult to schedule precisely.

Establishing a Baseline: Establishing an Environmental Restoration Five-Year Plan baseline requires an operational definition of a commitment. Lack of such a definition in the first Five-Year Plan caused confusion between commitments and milestones and between work in progress and work completed. Commitments and accomplishments are now defined. This Five-Year Plan, and all subsequent Plans, will track the accomplishment of commitments based on completion of a tangible, measurable activity. These measurable activities are either policy commitments or major field milestones. Under this definition, work in progress and the initiation of activities, with the exception of those initiation activities mandated by regulations or agreements, are not considered commitments. This definition establishes an Environmental Restoration Five-Year Plan baseline and will facilitate future comparison between what is promised and what is accomplished.

Environmental Restoration Planning Uncertainties: Environmental Restoration consists generally of assessment and cleanup. (See Section 3.1.1 for a more complete definition.) In most locations, Environmental Restoration activities are in the assessment phase of work plan development/approval, sampling, analysis, characterization and cleanup alternative identification, and regulatory approvals of plans. The particular nature of the assessment phase of Environmental Restoration entails a considerable degree of uncertainty, making precise project planning and accomplishment tracking difficult in advance of actual work.

Environmental Restoration Accomplishments: Environmental Restoration accomplishment of last year's major field milestones is provided by installation in the status sections of Attachment B. The status of all other Environmental Restoration commitments is given in Appendix B. Examples of Environmental Restoration accomplishments for FY 1989 are provided below.

ALBUQUERQUE - For Uranium Mill Tailings Remedial Action remediation, two sites and 769 vicinity properties have been completed. Kansas City Plant removed and disposed of offsite polychlorinated biphenyl (PCB) contaminated soils, relined the 002 raceway, and capped a nearby area. A groundwater optimization study, two Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI)/RCRA Corrective Measures Study documents, one RFI, and two RFI work plans were also completed. A remedial investigation (RI) was completed at a Sandia National Laboratories-Livermore site. An RI was completed and submitted to the regulators for the gasoline leaks and chemical burn pits at Pantex. Seven RCRA closure plans for inactive sites were submitted to the State by Los Alamos National Laboratory.

CHICAGO - The final design for underground storage tank removal at Argonne National Laboratory-East was completed, and construction has begun. Final cleanup of PCB-contaminated soil has been completed at Fermi.

IDAHO - The RFI Work Plan for the Test Area North (TAN) Groundwater and the Corrective Action Measures Study Work Plan for the Test Reactor Area Warm Water Pond were completed. A 65-ft column of 70 percent trichloroethylene residues was removed from the TAN injection well.

NEVADA - The Area 23 Hazardous Waste Trench closure plan was completed. The initial phase of the groundwater characterization well plan was also completed.

OAK RIDGE - Paducah Gaseous Diffusion Plant submitted the Phase I Investigation Site Work Plan to the Environmental Protection Agency (EPA) and Kentucky. The plan was approved by EPA, and characterization work was begun. Portsmouth Gaseous Diffusion Plant completed its groundwater quality assessment report for four RCRA units. Four RCRA unit closures were completed at the Oak Ridge Y-12 Plant.

RICHLAND - Seven RI work plans have been completed and approved by EPA. Two RI work plans (200-BP-1 and 1100-EM-1) have been approved by the regulators for investigations, and RIs began at both sites.

ROCKY FLATS - A draft Interagency Agreement was completed. Construction was initiated on the interim remedial action at 881 Hillside.

SAN FRANCISCO - The RI was completed, and pilot treatment plant operation for groundwater contamination at Lawrence Livermore National Laboratory (LLNL) began. RIs for two landfills and the burn pit facility and an RI/Feasibility Study of the Pit 7 complex at LLNL Site 300 were submitted to regulatory agencies.

SAVANNAH RIVER - Approval of the RCRA closure plan for the F/H Area Seepage Basin and for the sitewide RFI program plant at Savannah River Site was received.

3.3 CHANGES IN PLANNING FOR ENVIRONMENTAL RESTORATION SINCE THE FY 1991-1995 PLAN

Major changes to Environmental Restoration planning as set forth in the FY 1991-1995 Five-Year Plan are attributed to (1) new agreements, permits, and orders; (2) placement of certain sites on the National Priorities List (NPL); and (3) results of "Tiger Team" reviews.

<u>New Agreements, Permits, and Orders</u>: The principal requirements that prescribe the scope, nature, extent, and schedule for Environmental Restoration assessment and cleanup activities are those set forth in provisions of either (1) a Resource Conservation and Recovery Act (RCRA) permit issued either by the Environmental Protection Agency (EPA) or a State; (2) a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Interagency Agreement (IAG) or tri-party IAG between DOE and the EPA to which a State may be a third party; or (3) RCRA, CERCLA, or State orders or decrees. Such agreements, permits, or orders are legally binding on DOE, and all planning will reflect their provisions. Figure 3.3 lists 19 agreements that may have affected Environmental Restoration planning since publication of the FY 1991-1995 Five-Year Plan. (A complete listing of all currently in-force agreements, permits, and orders is included in Appendix D.)

<u>National Priorities List</u>: Placement of a site on the NPL has important implications with respect to planning connected with Environmental Restoration because such placement requires certain activities to proceed on a schedule prescribed by statute: CERCLA Section 120(e)(1) provides that not later than six months after the inclusion of a site on the NPL, DOE must commence to undertake a Remedial Investigation and Feasibility Study (RI/FS) pertaining to the site. Furthermore, Section 120(e)(2) requires, not later than 180 days from the conclusion of the RI/FS, that DOE and EPA enter into an IAG for completion of all necessary cleanup of the site and that "substantial continuous physical onsite remedial action" shall commence no later than 15 months after completion of the RI/FS.

With respect to tri-party IAGs, to avoid lengthy negotiations EPA policy requires EPA regions establish, in consultation with the involved State, a deadline for concluding negotiations. The negotiation period is generally set so as not to exceed 90 days. Such period may be extended to 120 days or, in certain circumstances, for a longer period.

At the time of publication of the FY 1991-1995 Five-Year Plan, DOE had five nuclear sites included on the NPL. Figure 3.3 lists ten additional sites that have been placed on the list and that have affected Environmental Restoration planning since publication of the FY 1991-1995 Five-Year Plan. Because of the schedule requirements imposed on NPL sites, such planning places increased emphasis on assessment activities. This emphasis is reflected in the increased funding estimates set forth for assessment during the FY 1992-1996 planning period. (A complete listing of all DOE NPL sites is included in Appendix E.)

Results of Tiger Team Reviews: Just before publication of the FY 1991-1995 Five-Year Plan, the Secretary of Energy established the "Tiger Team" Assessment Program. Conducted independently of line management by the Office of the Assistant Secretary for Environment, Safety, and Health, its purpose is to evaluate the environment, safety, and health programs being carried out at DOE's nuclear installations and to advise the Secretary of their effectiveness in connection with compliance with Federal, State, and local regulations; internal DOE requirements; and opportunities for achieving operational excellence. The results of such reviews are intended to provide the basis for taking management action to correct identified deficiencies. Included in such action may be revision in planning connected with Environmental Restoration.

As of May 1, Tiger Teams have completed reviews at 13 installations. A list of these installations is shown in Figure 3.3. Although the results of completed reviews vary, a number of general deficiencies have been noted with respect to Environmental Restoration, particularly in connection with planning, oversight, and quality assurance. Planning for Environmental Restoration set forth in this update reflects elements of action plans being developed by the Operations Offices to respond to these deficiencies.

NEW AGREEMENTS/ORDERS/PERMITS

IN-PLACE	PENDING *	IN-NEGOTIATION **
• PORTSMOUTH GASEOUS DIFFUSION PLANT (DOE/OH)	• ROCKY FLATS PLANT (DOE/EPA/CO)	• MOUND PLANT (DOE/OH)
• PINELLAS PLANT (DOE/EPA)	• MOUND PLANT (DOE/EPA)	• BROOKHAVEN NATIONAL LAB (DOE/EPA/NY)
• FEED MATERIALS PRODUCTION CENTER (DOE/EPA)	• PANTEX PLANT (DOE/EPA)	• IDAHO NATIONAL ENGINEERING LAB (DOE/EPA/ID)
• LOS ALAMOS NATIONAL LAB (DOE/EPA)	• OAK RIDGE RESERVATION (DOE/EPA/TN)	• WEST VALLEY SITE (DOE/EPA/NY)
	• MAYWOOD FUSRAP SITE (DOE/EPA)	• WELDON SPRING SITE (DOE/EPA)
	• WAYNE FUSRAP SITE (DOE/EPA)	• LAWRENCE LIVERMORE NATIONAL LAB SITE 300 (DOE/EPA/CA)
	• ST. LOUIS AIRPORT SITE (DOE/EPA)	• SOUTH VALLEY (DOE/DOD)
		• SAVANNAH RIVER SITE (DOE/EPA/SC)

NEW NATIONAL PRIORITIES LISTINGS	TIGER TEAM REVIEWS
• BROOKHAVEN NATIONAL LAB (NY)	• ROCKY FLATS PLANT (CO)
• FEED MATERIALS PRODUCTION CENTER (OH)	• FEED MATERIALS PRODUCTION CENTER (OH)
• IDAHO NATIONAL ENGINEERING LAB (ID)	• PORTSMOUTH GASEOUS DIFFUSION PLANT (OH)
• MONTICELLO URANIUM MILL SITE (UT)	• Y-12 PLANT (TN)
• MOUND PLANT (OH)	• PANTEX PLANT (TX)
• OAK RIDGE RESERVATION (TN)	• PINELLAS PLANT (FL)
• SAVANNAH RIVER SITE (SC)	• WEST VALLEY SITE (NY)
• HANFORD RESERVATION (FOUR SITES) (WA)	• KANSAS CITY PLANT (MO)
• ROCKY FLATS PLANT (CO)	• MOUND PLANT (OH)
• ST. LOUIS AIRPORT SITE (MO)	• NEVADA TEST SITE (NV)
	• SAVANNAH RIVER SITE (SC)
	• LAWRENCE LIVERMORE NATIONAL LAB (CA)
	• BROOKHAVEN NATIONAL LAB (NY)

* NEGOTIATIONS COMPLETE; EITHER DRAFT AGREEMENT AT AGENCY HEADQUARTERS FOR REVIEW OR DRAFT AGREEMENT UNDERGOING PUBLIC REVIEW BEFORE FINALIZATION

** NEGOTIATIONS NOT YET COMPLETE

Figure 3.3. New agreements, new additions to the National Priorities List, and results of Tiger Team reviews have contributed to changes in Environmental Restoration planning. (DOE = Department of Energy, EPA = Environmental Protection Agency, DOD = Department of Defense)

3.4.1 ALBUQUERQUE OPERATIONS OFFICE OVERVIEW

DOE Albuquerque Operations Office (AL) is fully committed to the assessment and cleanup of problems resulting from its inactive waste management units and facilities. AL demonstrated this commitment in 1984 with the establishment of a program to address inactive release sites.

AL established the Comprehensive Environmental Assessment and Response Program in 1984 to identify, assess, and correct actual/potential releases at AL installations. By 1988, the Comprehensive Environmental Assessment and Response Program was incorporated into the Environmental Restoration Program. Currently, Environmental Restoration activities at AL consist of the Environmental Restoration Remedial Action Program, the Decontamination and Decommissioning (D&D) Program, and the Uranium Mill Tailings Remedial Action Project (UMTRA).

The primary objective of the AL Environmental Restoration Remedial Action Program is to identify and restore inactive release sites at its installations. The AL Environmental Restoration Program is being implemented at the Kansas City Plant, Los Alamos National Laboratory, Mound Plant, Pantex Plant, Pinellas Plant, Sandia-Albuquerque, Sandia-Livermore, South Valley, and Inhalation Toxicology Research Institute (Energy Research Facility). The two primary acts governing assessment and cleanup of inactive release sites are the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

The fundamental responsibility of the DOE D&D Program is to protect the public and the environment from potentially harmful radioactive contamination at surplus DOE facilities. To that end, AL conducts surveillance, maintenance, and decontamination or decommissioning of those facilities within the AL complex. The D&D of inactive facilities complies with the intent of Executive Order 12088, "Federal Compliance with Pollution Control Standards"; DOE Order 5480.1B, "Environmental Safety and Health Program for Department of Energy Operations"; DOE Order 5820.2A, "Radioactive Waste Management"; and CERCLA.

The Uranium Mill Tailings Radiation Control Act of 1978, Public Law 95-604, authorizes DOE to undertake remedial actions at 24 designated inactive uranium processing sites and approximately 5,000 vicinity properties. The purpose of this remedial action is to stabilize and control uranium mill tailings and other residual radioactive materials in a safe and environmentally sound manner to minimize radiation hazards to the public.

Past operations in support of Defense Programs production missions at AL facilities left a legacy of radioactive and hazardous waste problems that must be rectified. Most of the problems being addressed in the Environmental Restoration category are the result of past waste management practices that, although considered acceptable at the time, no longer meet today's more stringent standards for protection of human health and the environment.

During the six years of AL's program, more than 1,000 potential release sites across the AL complex have been identified as needing further assessment and/or cleanup. In addition, approximately 22 surplus facilities are included in the D&D Program for surveillance and maintenance or final decommissioning.

The types and extent of contamination vary from one place to another. Attachment B describes in more detail the problems, status of Environmental Restoration activities, and risks for each installation in the AL complex. In general, the types of wastes found include radionuclides, solvents, gasoline, organics, metals, high-explosive residues, and uranium tailings. These wastes are primarily present in soils, groundwater, surface waters, buildings, structures, and equipment. In many cases, hazardous and radioactive contaminants are found together as "mixed" wastes.

Active surveillance and maintenance programs help ensure that many contaminated sites and facilities do not become significant, immediate health risks to employees or to the public. On the other hand, a number of sites containing unstabilized mill tailings constitute a recognized source of environmental harm and risk to human health and safety as a result of radon gas emissions. Groundwater at certain sites has been contaminated by radiological and nonradiological hazardous constituents that have been carried into the soil by percolating rainwater. This contamination constitutes a potential source of exposure to possible toxic and cancer-causing agents.

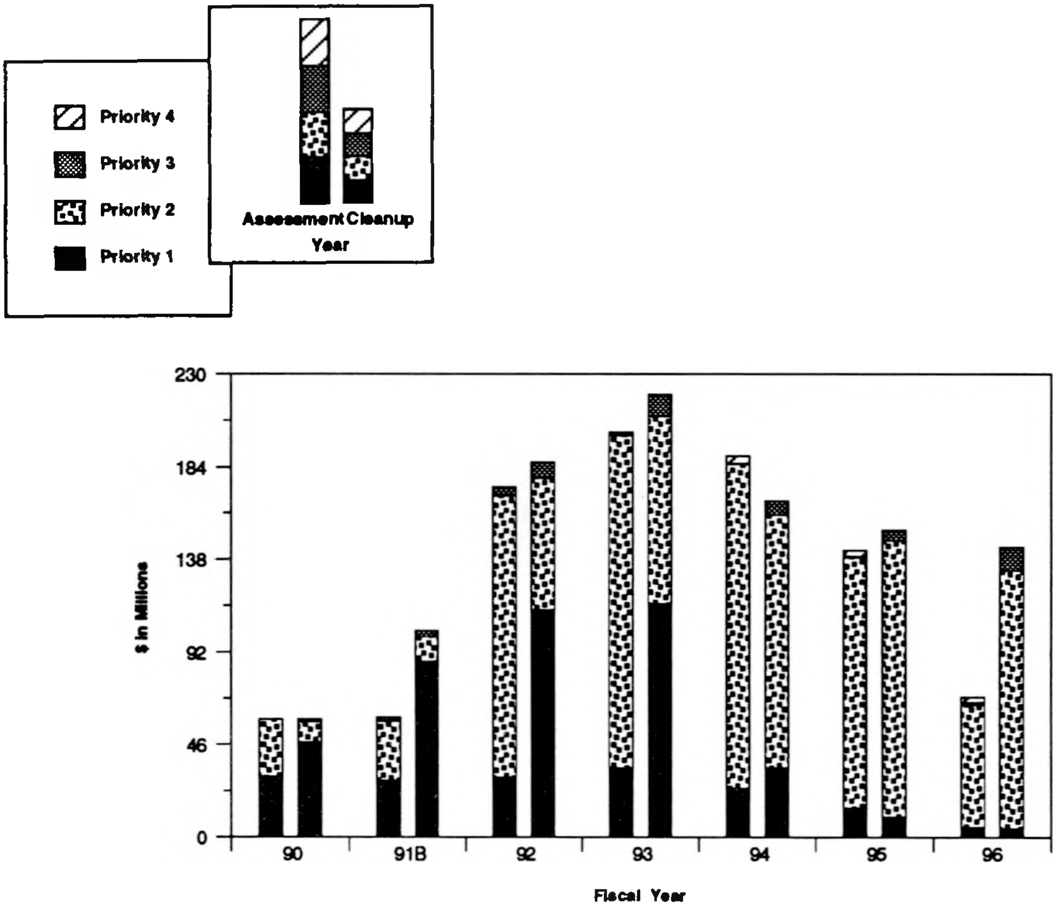
Between FY 1991 and FY 1996, the AL Environmental Restoration Remedial Action Program will complete the CERCLA remedial investigation/feasibility study and/or the RCRA Facility Investigation/Corrective Measures Study activities for the higher-priority sites. All of the installations will have signed RCRA or CERCLA multiparty agreements for remediation or will be regulated under the corrective action provisions of the RCRA Part B Permit. All installations will have implemented cleanup, including RCRA closures and/or CERCLA Remedial Actions at sites that require more immediate attention.

Key UMTRA activities planned for FY 1991-1996 include completion of nine sites by the end of FY 1991, three more by the end of FY 1992, four more by the end of FY 1993, and the remaining eight sites by the end of FY 1994. Certification and licensing of the last eight sites will extend into FY 1995.

Figure 3.4.1 provides anticipated funding needs, broken out by fiscal year, priority, and activity phase.

Further information on the Albuquerque installations is provided in Attachment B.

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 Estimates of Costs By Priority Level (Thousands of Dollars)

	Priority 1		Priority 2		Priority 3		Priority 4		Total	
Year	A*	C**	A*	C**	A*	C**	A*	C**	A*	C**
FY90	30,255	47,256	20,587	9,805	368	1,482	67	0	51,277	58,543
FY91B	28,121	87,440	29,362	12,082	751	3,065	1,076	0	59,310	102,587
FY92	29,935	112,969	139,768	65,347	4,037	7,999	503	0	174,243	186,315
FY93	34,612	116,203	165,220	92,981	867	10,682	705	0	201,404	219,866
FY94	24,322	34,490	160,980	125,714	417	6,849	3,669	0	189,388	167,053
FY95	14,558	10,335	124,364	136,976	767	5,216	2,645	0	142,334	152,527
FY96	5,093	4,511	60,824	127,965	1,237	11,530	2,530	0	69,684	144,006
FY92-96 TOTAL	108,520	278,508	651,156	548,983	7,325	42,276	10,052	0	777,053	869,767

A* Assessment C** Cleanup

Grand Total 1,646,820

Figure 3.4.1. Funding needs for the Albuquerque Operations Office are projected by phase, fiscal year, and priority.

3.4.2 CHICAGO OPERATIONS OFFICE OVERVIEW

The Chicago Operations Office (CH) policy is to maintain a strong program of environmental compliance with current and anticipated regulations.

The primary mission of the facilities under CH is research and development. The Environmental Restoration activities reflect the nature of this work. CH's facilities are aging, and many sites are former waste disposal sites that need to be assessed to determine the extent, if any, of the environmental contamination.

Environmental Restoration activities may be grouped into three areas:
(1) assessment of sites to determine the extent and nature of contamination;
(2) remediation of sites based on the assessments to ensure that sites are effectively cleaned up; and (3) proper surveillance, maintenance, and ultimate decontamination and decommissioning (D&D) of facilities that have exceeded their useful operational lives.

Of special concern in the area of remediation are the activities needed to prevent or remedy groundwater contamination that may pose a health threat either onsite or offsite. There are many other remedial actions of inactive storage and disposal sites for which the laboratories reporting to CH are responsible, including

- replacement of underground storage tanks (USTs) to comply with the Resource Conservation and Recovery Act (RCRA) UST regulations promulgated by the Environmental Protection Agency (EPA);
- removal of mixed waste from landfills or storage/disposal sites and transfer of these wastes to facilities and sites that meet current environmental regulations and standards; and
- cleanup of minor spills of oils, solvents, and other chemicals, including polychlorinated biphenyl (PCB) leaks from transformers.

Health risks associated with these activities include possible exposure to organic and inorganic chemicals, radiation, and other contaminants that may have migrated into surface waters and groundwaters near the installations. Based on available information, there are no known instances of confirmed exposure offsite at any of the facilities. The risks are being lessened by assessment and remediation work being completed under RCRA; the Comprehensive Environmental Response, Compensation, and Liability Act; the Clean Water Act; and appropriate State and local regulations, including enforceable agreements with EPA and the States.

All laboratory operators are required to have an effective D&D program that promotes cost-effective surveillance, maintenance, and D&D of DOE facilities. These activities include the shutdown of nuclear reactors, hot cells, cyclotrons, laboratories, and support facilities.

Several key accomplishments have occurred in the past year at laboratories reporting to CH.

- At Brookhaven National Laboratory (BNL), the Federal Facility Agreement (FFA) among the State of New York, EPA, and DOE should be finalized this year, thus allowing remediation to proceed in a timely fashion and alleviating possible contamination of the underlying sole-source aquifer.
- At Battelle Columbus Laboratories (BCL), D&D has begun at the King and West Jefferson Street sites.
- At Argonne National Laboratory-East (ANL-E), D&D of the experimental Boiling Water Reactor (EBWR) and CP-5 Reactor is under way.
- At Fermilab, the remediation of soils is nearing completion.
- At the Princeton Plasma Physics Laboratory, the remediation of USTs was initiated and continues.
- At Argonne National Laboratory-West (ANL-W), the IAG should be completed this year among the State of Idaho, EPA, and DOE.

In FY 1992 it is expected that the following activities will be completed:

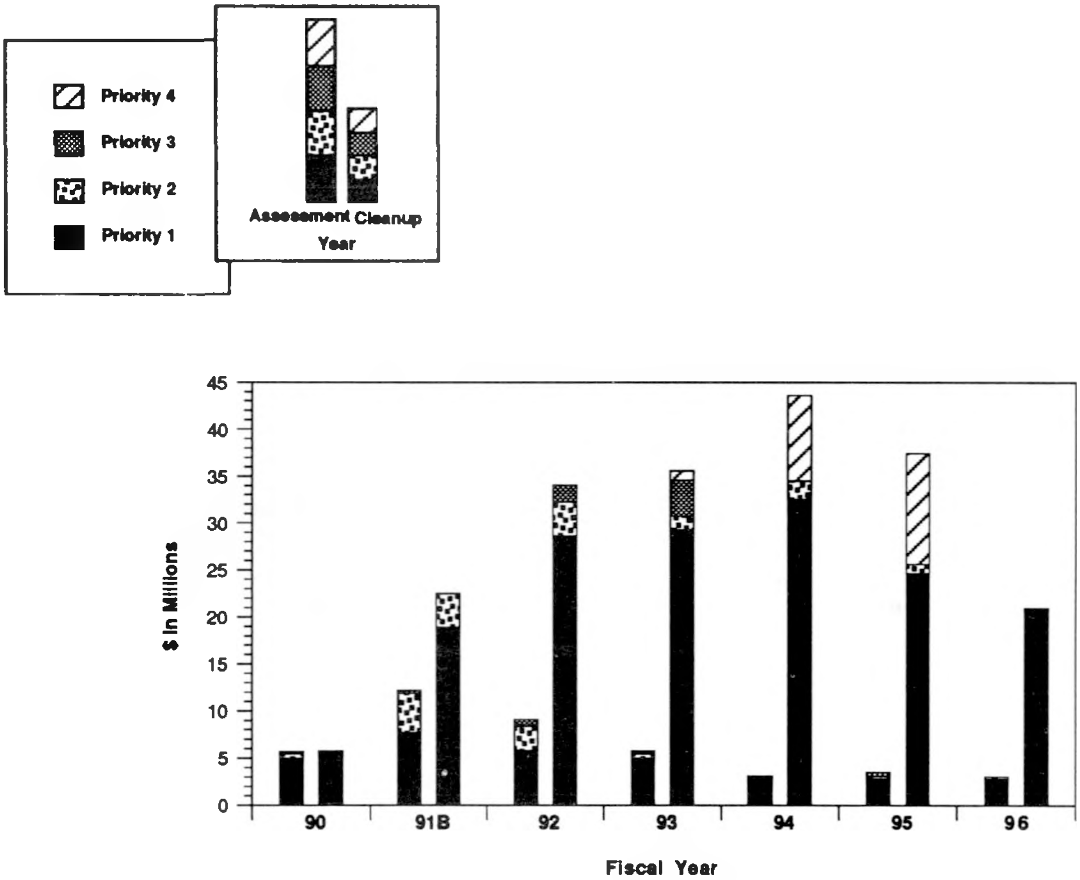
- At Fermilab, the PCB spill cleanup will be completed.
- At ANL-W, D&D of the Central Liquid Waste Processing Area will be completed.
- At ANL-E, the EBWR reactor vessel will be removed.
- At New Brunswick Laboratory-New Jersey, pitchblende-contaminated soils will be removed.
- At BCL, D&D of Building 6 at the King Street site will be completed.
- At BNL, the construction of impermeable caps on the landfill will be completed.

By the end of FY 1995, it is expected that most of the required remediation of the sites will be completed except for BCL. The BCL D&D will have several major portions completed by the end of FY 1995, but activities are expected to continue for several years beyond 1995.

Figure 3.4.2 provides anticipated funding needs, broken out by fiscal year, priority, and activity phase.

Additional information on CH installations is presented in Attachment B.

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 Estimates of Costs By Priority Level (Thousands of Dollars)

	Priority 1		Priority 2		Priority 3		Priority 4		Total	
Year	A*	C**	A*	C**	A*	C**	A*	C**	A*	C**
FY90	4,978	5,747	493	0	233	0	0	0	5,704	5,747
FY91B	7,703	18,894	4,155	3,570	323	16	0	0	12,181	22,480
FY92	5,833	28,661	2,507	3,570	750	1,852	0	0	9,090	34,083
FY93	4,962	29,288	510	1,500	250	3,800	0	1,000	5,722	35,588
FY94	2,907	32,536	200	2,000	0	0	0	9,050	3,107	43,586
FY95	2,859	24,641	209	1,000	452	0	0	11,800	3,520	37,441
FY96	2,844	20,939	218	0	0	0	0	0	3,062	20,939
FY92-96 TOTAL	19,405	136,065	3,644	8,070	1,452	5,652	0	21,850	24,501	171,637

A* Assessment C** Cleanup Grand Total 196,138

Figure 3.4.2. Funding needs for the Chicago Operations Office are projected by phase, fiscal year, and priority.

3.4.3 IDAHO OPERATIONS OFFICE OVERVIEW

Remedial actions being conducted at the two primary program areas of the Idaho Operations Office (ID) are being performed in accordance with compliance agreements with the responsible Environmental Protection Agency (EPA) regional offices.

ID is performing Environmental Restoration activities at Idaho National Engineering Laboratory (INEL) under a formal Consent Order and Compliance Agreement (COCA) between EPA Region X and ID. The U.S. Geological Survey is also a signatory to the COCA in an advisory role. INEL has been placed on the National Priorities List (NPL), and negotiations are under way to establish an Interagency Agreement (IAG), as required by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Under the COCA, about 350 solid waste management units (SWMUs) have been identified. Of these 350 SWMUs, only three have been confirmed to involve the release of hazardous constituents. SWMUs have been assigned to Waste Area Groups (WAGs) for management. Decontamination and decommissioning (D&D) of inactive facilities is an integral part of the Environmental Restoration program. Surveillance and maintenance of these D&D sites will minimize the potential health and safety risks to the site workers and to the public.

The primary concern of the remedial action program is the cleanup of the three release sites responsible for placement of INEL on the National Priorities List. These sites exhibit volatile organic and chromium contamination and have the potential to contaminate the Snake River aquifer. Other contaminants, such as petroleum products, acids, bases, solvents, heavy metals, polychlorinated biphenyls, and asbestos are being investigated. At the Test Area North (TAN) Site, there was a slight potential health risk to INEL employees due to migration of volatile organics into drinking water. This problem was mitigated in 1989, and cleanup is ongoing.

The regulatory drivers currently include the COCA, the Resource Conservation and Recovery Act (RCRA), CERCLA, and other applicable State and Federal regulations. INEL is currently negotiating an IAG under CERCLA that should be finalized in the fall of 1990. It is anticipated that the IAG will integrate CERCLA and RCRA requirements and will supersede the COCA.

INEL has made all submittals required by the COCA and has submitted closure plans for 30 land disposal units (LDUs). Two of these plans have been started, and characterization of most LDUs has begun. Characterization of all LDUs should be completed within the next two years. Summary assessments for over 30 sites have been approved by EPA for deletion from the list of facilities in the COCA.

By FY 1992, major Environmental Restoration assessments will be under way and remedial actions begun at all INEL WAGs. Completion of the BORAX-V Turbine Building and the SPERT-IV D&D projects is expected by the end of FY 1990. Completion of the Buried Waste Program Remedial Investigation/ Feasibility Study (RI/FS) reports is expected by FY 1994, and complete cleanup of TAN, Central Facilities Area, EBR-1/BORAX, and the miscellaneous WAGs is expected by the end of FY 1996.

At the Grand Junction and Monticello Vicinity Properties projects, the primary concerns include elimination of radiation, inhalation of radon gas, and potential long-term health risks posed by groundwater contamination.

Uranium mill tailings were used for construction and landscaping on approximately 5,000 vicinity properties before the potential health hazards from radon gas and gamma radiation were recognized. Asbestos and hazardous and mixed wastes are commonly identified at the vicinity properties and at abandoned uranium mill sites. Groundwater contamination beneath the Grand Junction Projects Office (GJPO) facility and the Monticello Millsite has occurred.

The Grand Junction Vicinity Properties Project is part of the Uranium Mill Tailings Remedial Action (UMTRA) project and is mandated by PL-95-604. To date, 3,690 properties have been included and over 2,290 remediated. The project is over 60 percent complete. Tailings removal will be completed in FY 1992, with closeout anticipated in FY 1993.

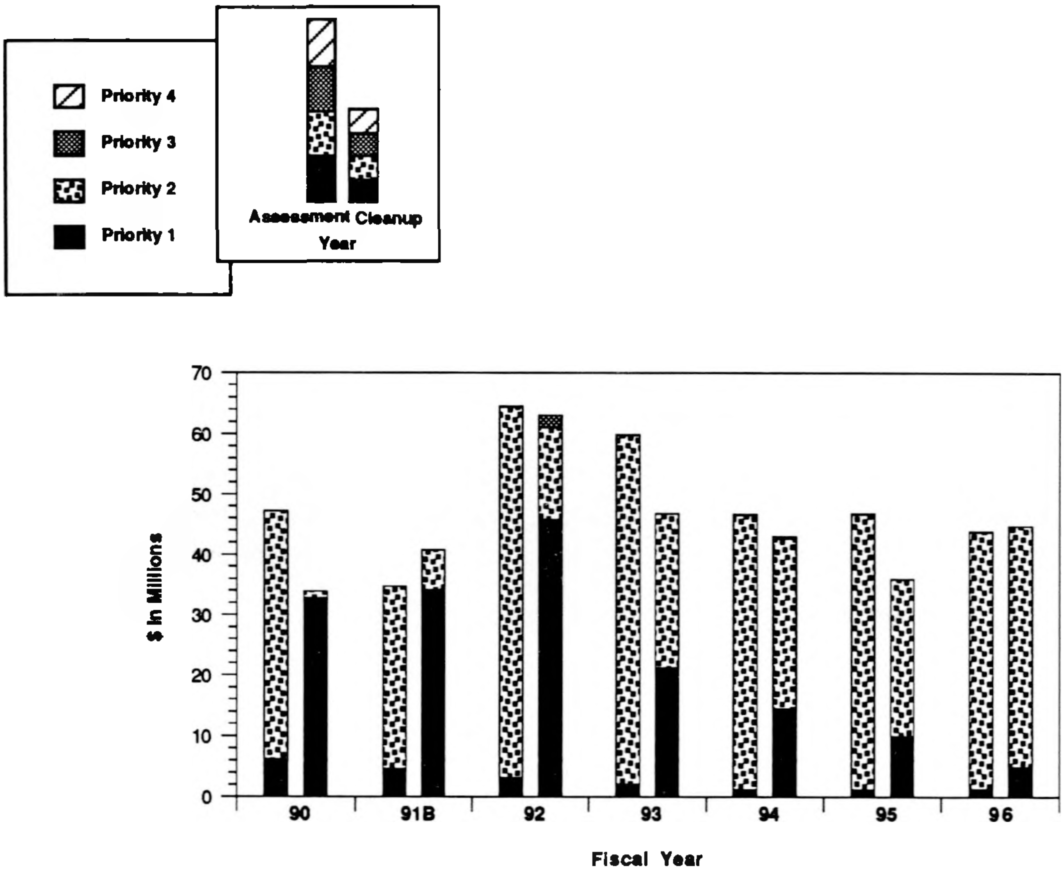
Monticello Millsite and Vicinity Properties have a Federal Facility Agreement (FFA) in place with EPA Region VIII and the State of Utah. A Superfund Record of Decision (ROD) was issued on the Monticello Vicinity Properties in December 1989. The ROD for the Millsite is scheduled for June 1990. Detailed engineering design will be completed in FY 1992, and tailings removal will be complete in FY 1996. The GJPO Remedial Action Project has written agreements with EPA Region VIII and the State of Colorado. Assessment activities are complete, and the RI/FS was issued for public review in June 1989. The GJPO Remedial Action Project includes the D&D of four retired process buildings and removal of tailings buried throughout various locations. Preliminary activities have been initiated for the retired process buildings and the tailings removal projects. Remediation activities will be initiated after ROD issuance in the third quarter of FY 1990 and will continue until completion in FY 1992.

The Long-Term Surveillance and Maintenance Program involves the routine surveillance and maintenance of approximately 30 disposal facilities that will be established in accordance with the completed mission objectives of the Formerly Utilized Site Remedial Action Project, Surplus Facilities Management Program, and UMTRA projects and low-level waste programs. The first disposal sites are expected to be transferred to the program in FY 1993. The Long-Term Surveillance and Maintenance Program does not have a scheduled completion date. Long-term care will be required until the radioactively contaminated wastes reach an acceptable decay level, and unrestricted release can be permitted.

Figure 3.4.3 provides anticipated funding needs, broken out by fiscal year, priority, and activity phase.

Additional information on INEL and the GJPO is presented in Attachment B.

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 Estimates of Costs By Priority Level
(Thousands of Dollars)

Year	Priority 1		Priority 2		Priority 3		Priority 4		Total	
	A*	C**	A*	C**	A*	C**	A*	C**	A*	C**
FY90	6,264	32,799	40,914	1,055	0	0	0	0	47,178	33,854
FY91B	4,583	34,214	30,167	6,537	0	50	0	0	34,750	40,801
FY92	3,207	45,824	61,125	15,209	150	2,000	0	0	64,482	63,033
FY93	2,138	21,217	57,590	25,560	250	0	0	0	59,978	46,777
FY94	1,260	14,510	45,210	28,120	150	300	0	0	46,620	42,930
FY95	1,300	10,020	45,300	25,880	150	0	0	0	46,750	35,900
FY96	1,410	5,010	42,300	39,740	150	0	0	0	43,860	44,750
FY92-96 TOTAL	9,315	96,581	251,525	134,509	850	2,300	0	0	261,690	233,390

A* Assessment C** Cleanup Grand Total 495,080

Figure 3.4.3. Funding needs for the Idaho Operations Office are projected by phase, fiscal year, and priority.

3.4.4 NEVADA OPERATIONS OFFICE OVERVIEW

Because of the unique types of activities conducted at the Nevada Test Site (NTS), the nature of Environmental Restoration activities may vary significantly from that at other DOE facilities.

The DOE Nevada Operations Office (NV) operates the NTS (including historical test areas on the Tonopah Test Range and Nellis Air Force Range Area 13) and eight offsite areas. Each of these sites was used primarily for the testing of nuclear explosive devices; since 1973, all testing has been limited to NTS. NTS has been used for almost 700 nuclear tests consisting of both aboveground (until 1963) and belowground tests. Each test, by the nature of the nuclear explosions (either fission or fusion), produces a large amount of radioactivity. In addition, the operation and decontamination of equipment and test facilities at the NTS generate hazardous, radioactive, and mixed wastes. There are 777 individual release sites that will be addressed as part of the NV Environmental Restoration Program. The contaminants of concern include radionuclide species, metals, and, in the case of ancillary support facilities, organic compounds, metals, and petroleum.

The eight offsite test areas include the Central Nevada Test Site, Nevada; Amchitka Island, Alaska; the Shoal Test Area, Nevada; the Rio Blanco Gas Stimulation and Rulison Gas Stimulation test sites, Colorado; the Gasbuggy Stimulation and Gnome-Coach test sites, New Mexico; and the Tatum Dome Test Site, Mississippi. In addition to localized subsurface contamination with radionuclides, some of the sites have surficial contamination with hazardous and mixed wastes related to drilling mud disposal pits.

The primary pathways for the migration of contamination at the NTS are through the disturbance of contaminated soils and the flow of contaminated groundwater. No offsite risks to public health or the environment are believed to be present as a result of the activities being conducted at NTS. The remoteness of the site and the rigidly controlled access prevent inadvertent public exposure. NV has taken special precautions to reduce risks to worker populations, and the potential for offsite migration of contamination, although considered negligible, will be thoroughly evaluated as part of the Environmental Restoration program.

The principal regulatory drivers for the NV Environmental Restoration program are the provisions and implementing regulations of the Comprehensive Environmental Response, Compensation and Liability Act; the Resource Conservation and Recovery Act (RCRA); the Safe Drinking Water Act; the National Contingency Plan; and the State environmental laws and regulations governing each site. The regulatory authorities include the Environmental Protection Agency regional offices for each site and the corresponding State environmental divisions or departments.

To achieve compliance with the environmental regulations, NV has instituted an Environmental Restoration program with early emphasis placed on determining the significance of the damage to the environment. The scope of the Environmental Restoration activities covers the development and implementation of closure plans for numerous sites where hazardous and/or mixed wastes were disposed of, the installation of groundwater characterization wells, the conduct of remedial investigations and feasibility studies of waste area groups, the cleanup of large surface areas contaminated with small amounts of radioactive materials, the remediation of industrial sites as required, and the evaluation and restoration of offsite locations. Eight facilities at NTS are scheduled for decontamination and decommissioning.

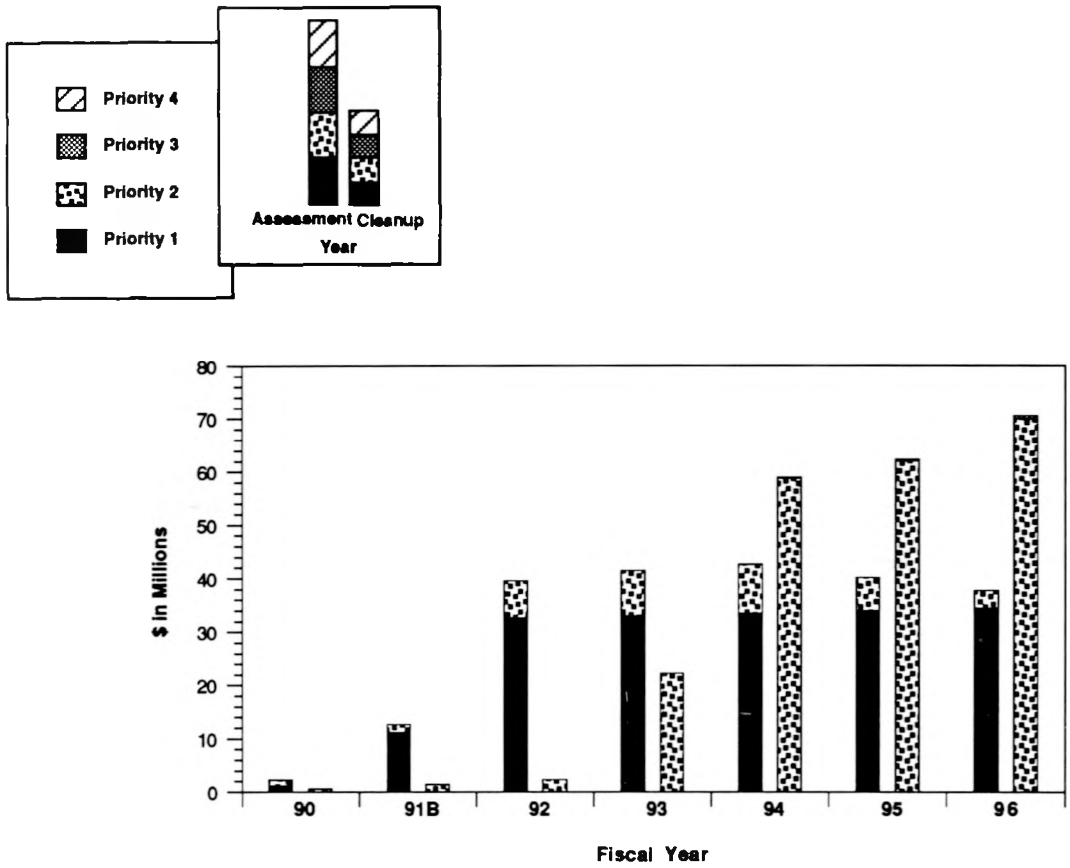
Most of the planned activities have an appropriate and established technical basis. The cleanup of large surface areas (3,000 acres) contaminated with low levels of radioactivity, however, requires that new technologies be developed. Another area of concern is the constraints on the characterization of the subsurface conditions resulting from each underground test. There are no established protocols for determining the data required or the techniques necessary to safely acquire these data. Special provisions may be necessary to characterize these areas to ensure that the Environmental Restoration program that is implemented resolves, rather than results in, releases to the environment. In FY 1992, NV will be continuing remedial investigations at the following: Yucca Flat and Rainier Mesa underground testing areas; the areas at NTS, Tonopah Test Range, and Nellis Air Force Range Area 13 where soils were contaminated as a result of safety experiments; and the sumps and injection wells that historically were used for the disposal of wastes. Remedial investigations will be initiated at the Contaminated Waste Sites during FY 1992. Implementation of closure plans for some of the RCRA sites has been accelerated.

By the end of FY 1996, the aggressive Environmental Restoration program planned by NV will have addressed all of the areas of major concern at NTS and offsite locations. With the exception of the muckpiles and tunnel ponds, the remedial investigations and feasibility studies will be completed for all of the waste area groups. Actual remediation will have begun for the contaminated soils at NTS, Tonapah Test Range, and Nellis Air Force Range Area 13 as well as for the inactive storage tanks and leachfields. The monitoring programs for the underground testing areas will also be under way.

Figure 3.4.4 provides anticipated funding needs, broken out by fiscal year, priority, and activity phase.

Additional information on NTS and offsite test locations is presented in Attachment B.

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 Estimates of Costs By Priority Level (Thousands of Dollars)

Year	Priority 1		Priority 2		Priority 3		Priority 4		Total	
	A*	C**	A*	C**	A*	C**	A*	C**	A*	C**
FY90	1,220	0	1,060	569	0	0	0	0	2,280	569
FY91B	11,150	0	1,507	1,450	0	0	0	0	12,657	1,450
FY92	32,710	0	6,875	2,300	0	0	0	0	39,585	2,300
FY93	33,010	0	8,468	22,300	0	0	0	0	41,478	22,300
FY94	33,500	0	9,160	58,800	0	198	0	0	42,660	58,998
FY95	34,000	0	6,125	62,075	0	234	0	0	40,125	62,309
FY96	34,500	0	3,250	70,050	0	500	0	0	37,750	70,550
FY92-96 TOTAL	167,720	0	33,878	215,525	0	932	0	0	201,598	216,457

A* Assessment C** Cleanup

Grand Total 418,055

Figure 3.4.4. Funding needs for the Nevada Operations Office are projected by phase, fiscal year, and priority.

3.4.5 OAK RIDGE OPERATIONS OFFICE OVERVIEW

DOE established remedial actions and decontamination and decommissioning (D&D) activities for each installation managed by Oak Ridge Operations Office (OR).

The goal of the remedial actions activities at the eight installations managed by OR is to protect the workers, the public, and the environment by cleaning up the inactive waste sites and surplus facilities contaminated with radioactive, hazardous, or mixed wastes.

The Oak Ridge Environmental Restoration Program is being implemented at the Feed Materials Production Center (FMPC), Formerly Utilized Sites Remedial Action Program (FUSRAP), Oak Ridge Gaseous Diffusion Plant, Oak Ridge National Laboratory, Oak Ridge Y-12 Plant, Paducah Gaseous Diffusion Plant, Portsmouth Gaseous Diffusion Plant (PORTS), and the Weldon Spring Site.

The installations managed by OR have large amounts of accumulated hazardous and radioactive wastes and contaminated facilities. The tables in Attachment B describe the extent and types of contamination at OR sites. All OR installations will require extensive remediation, and activities have started at each installation.

Existing regulatory requirements and pending agreements with regulatory authorities ensure that aggressive schedules are established and maintained for Environmental Restoration at the OR installations. The remedial actions activities and schedules are driven by the requirements of the Resource Conservation and Recovery Act (RCRA); the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); interagency agreements (IAGs), Federal Facility Compliance Agreements (FFCAs); Federal Facility Agreements (FFAs); or a RCRA 3004(u) Permit. An FFCA between DOE and the Environmental Protection Agency (EPA) Region V was signed in July 1986 for FMPC. Timetables for meeting CERCLA milestones at FMPC were included in the remedial investigation/feasibility study (RI/FS) work plan approved in May 1988. The FFCA was amended in July 1988 to include enforceability language and document review periods for the EPA Region V. An IAG under Section 120 of CERCLA has been signed for Fernald. A FFCA with EPA Region V was executed in September 1986 for PORTS. DOE signed a Consent Order with EPA in October 1989 agreeing on site remedial action plans in lieu of litigation to establish DOE remedial actions obligations. For Weldon Spring, an FFA between EPA Region VII and DOE was executed in August 1986. DOE is currently concluding FFAs with EPA Region II concerning the remediation of two FUSRAP sites on the National Priorities List in New Jersey and with EPA Region VII for all FUSRAP sites in Missouri. OR is concluding an FFA among DOE, EPA, and the Tennessee Department of Health and Environment that will cover all RCRA/CERCLA cleanup activities at all Oak Ridge facilities.

All OR installations included D&D within their Environmental Restoration activities.

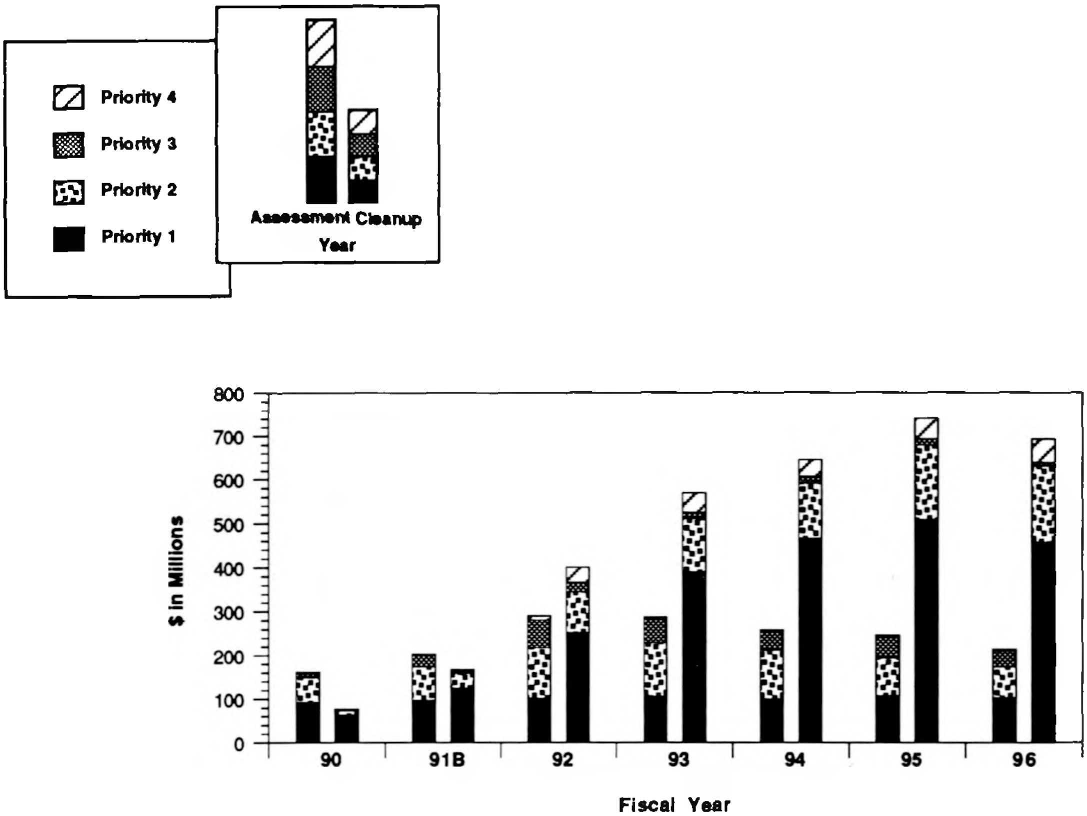
The near-term regulatory drivers for D&D are the Toxic Substances Control Act and RCRA, as related to the removal of friable asbestos and the disposal of polychlorinated biphenyls and hazardous materials that are considered waste. After removal of these materials, most D&D work will likely be delayed until other restoration activities required by regulations are near completion. Most of the D&D work is Priority 4. Surveillance and maintenance activities, which are Priority 1, are performed to ensure adequate protection of employees, the public, and the environment until D&D is implemented.

The Environmental Restoration activities for the installations under OR management have been prioritized for this Plan. Ongoing cleanup activities and those activities required to ensure that immediate risks to workers, the public, and the environment are reduced to prescribed levels and to prevent the further spread of contamination are given highest priority. Currently, the majority of individual resources is being consumed in conducting RI/FS and RCRA Facility Investigations to maintain compliance with regulations mandated by CERCLA and RCRA 3004(u). Actual cleanup at most sites will begin after the RI/FS or RCRA Facility Investigation has been completed and the Record of Decision issued.

Figure 3.4.5 provides anticipated funding needs, broken out by fiscal year, priority, and activity phase.

Additional information for each OR installation is presented in Attachment B.

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 Estimates of Costs By Priority Level (Thousands of Dollars)

Year	Priority 1		Priority 2		Priority 3		Priority 4		Total	
	A*	C**	A*	C**	A*	C**	A*	C**	A*	C**
FY90	93,684	63,476	55,646	9,955	8,895	3,120	4,031	415	162,256	76,966
FY91B	97,185	125,157	77,960	34,747	27,665	7,380	0	0	202,810	167,284
FY92	101,947	252,966	116,335	92,310	62,942	20,944	8,825	34,600	290,049	400,820
FY93	105,830	390,781	123,473	120,508	53,662	13,435	4,825	44,304	287,790	569,028
FY94	100,967	465,577	111,269	126,579	43,516	14,576	3,545	38,377	259,297	645,109
FY95	107,368	508,483	87,981	170,744	47,939	14,474	3,545	48,162	246,833	741,863
FY96	102,406	458,102	71,282	172,112	36,936	9,021	3,545	53,662	214,169	692,897
FY92-96 TOTAL	518,518	2,075,909	510,340	682,253	244,995	72,450	24,285	219,105	1,298,138	3,049,717

A* Assessment C** Cleanup Grand Total 4,347,855

Figure 3.4.5. Funding needs for the Oak Ridge Operations Office are projected by phase, fiscal year, and priority.

3.4.6 RICHLAND OPERATIONS OFFICE OVERVIEW

DOE established an Environmental Restoration program at the Hanford Site that is being implemented on a prioritized basis consistent with the Tri-Party Agreement (May 15, 1989) among DOE, the Environmental Protection Agency (EPA), and the State of Washington Department of Ecology.

The goal of the Environmental Restoration activities at the Hanford Site is to protect the workers, the public, and the environment by cleaning up inactive waste sites and surplus facilities contaminated with radioactive hazardous or mixed wastes.

The Hanford Site, located in Southeastern Washington State, covers 560 square miles (358,400 acres). There have been various activities at this site since 1943. Some of the Nation's earliest nuclear reactors and nuclear fuels reprocessing facilities are located at this site. The Hanford Site's missions include plutonium separations, waste management, environmental restoration, advanced reactor design and testing, basic scientific research, and renewable energy technologies development. The Site is in an arid location, with the largest fraction of the waste sites in the central plateau area well away from the Columbia River. About 340,000 people reside within a 50-mile radius of the center of the Site (1980 U.S. Census).

At the Hanford Site, the Federal Government generated wastes that are regulated both as radioactive materials and as hazardous chemicals. Approximately 1,100 waste sites have been identified as potentially requiring some degree of remediation. Most of these sites resulted from onsite storage or soil column disposal of low-level radioactive and chemical waste resulting primarily from the production and chemical processing of plutonium. Stored wastes in 149 underground single-shell tanks that are no longer being used are part of this inventory. These tanks contain mostly residual sludges and salt cake resulting from the transfer or evaporation of the liquids.

These approximately 1,100 individual waste sites, varying in size from very small to 1,800 acres in size, have been grouped into 78 operable units that have characteristics amenable to combined characterization and/or remediation. These 78 operable units have been further organized into four large aggregate areas based primarily on their geographic location on the Hanford Site. It is these four aggregate areas, the "100" Area (reactors), the "200" Area (chemical reprocessing and waste management facilities), the "300" Area (fuel fabrication and research and development facilities), and the "1100" Area (vehicle maintenance facilities), that have been included by the EPA on the National Priorities List (NPL). Of the 78 operable units, four have been created to characterize and remediate the groundwater under the waste sites.

Currently, more than 100 surplus facilities at the Hanford Site are radioactively contaminated. These include the major reactor and chemical process buildings and structures, as well as many ancillary structures. The ancillary structures include exhaust stacks, the reactor gas drying/recirculation building, the chemical storage and handling building, storage tanks, effluent piping and tunnels, effluent retention structures, and river outfall structures.

Due to the number and extent of contaminated facilities as well as the types and large volumes of waste at Hanford, characterization and assessment are under way to determine current and future public health risks. The characterization and assessment will identify remedial activities that could be taken to offset risk factors. The 100 and 300 aggregate areas are located next to the Columbia River, and the 1100 aggregate area is close to a Richland, Washington, drinking water well field. Ongoing surveillance and maintenance activities are essential in the interim for identifying actions to maintain confinement and mitigate any increase in health risk.

The Hanford Federal Facility Agreement (FFA) and Consent Order, referred to as the Tri-Party Agreement, is an agreement among DOE, EPA, and the State of Washington Department of Ecology. This agreement establishes jurisdictions, authorities, and other legal responsibilities for the parties, including activity schedules and milestones. The primary objective of the Tri-Party Agreement is to ensure that the Hanford Site is cleaned up in a timely manner. The other objectives of the agreement are to achieve compliance with Resource Conservation and Recovery Act (RCRA) and Comprehensive Environmental Response, Compensation, and Liability Act requirements; ensure adequate public involvement in decisions dealing with the cleanup; and ensure that the work is properly prioritized. The action plan for carrying out the agreement defines how the parties will work together, describes the processes and procedures to be followed, defines the waste units to be addressed, and provides the enforceable milestones for the work schedule. Thirty-two milestones have been completed as of January 1990.

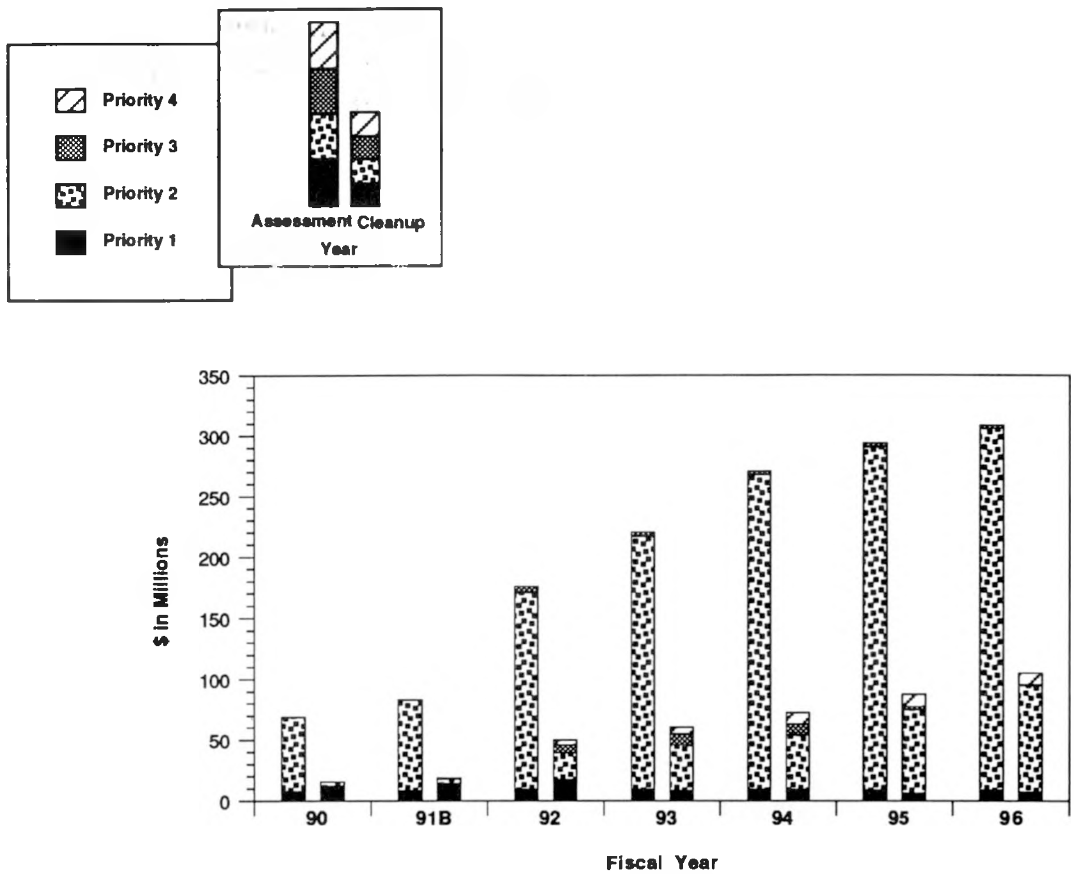
Environmental Restoration activities at the Hanford Site are prioritized, planned, and scheduled to meet cleanup objectives. In accordance with the Hanford FFA and Consent Order, 43 remedial investigations (RIs) are required to start through the FY 1996 time period. To date, 13 work plans have been initiated, with nine having been submitted to the regulators for review and approval. Of the 13 work plans started, two have been submitted, two have been approved, and one is in progress. In addition, the characterization program for single-shell tanks has been initiated, with 15 samples having been taken from two single-shell tanks. Surveillance and maintenance of more than 100 radioactively contaminated surplus facilities is ongoing, with no identified emergency corrective actions. Three major D&D projects are in progress, including the D&D and closure of the 183-H Solar Evaporation Basin, asbestos removal from the 105-C and 105-H reactors, and D&D of the Semiworks Facility. Future D&D activities are also planned for the 100 Area reactors, ancillary and effluent facilities, and the Plutonium Concentration Facility located in the 200 Area.

Although much is known about the past activities and contamination at the site, significant uncertainties remain at the current preliminary phase of the remedial process. Until the total extent of the contamination is known, the planning, schedules, and costs of the cleanup will contain this inherent uncertainty. In 1992, 17 RI/feasibility studies (FSs) or RCRA Facility Investigation/RCRA Corrective Measures Study (RFI/CMS) Work Plans will have been submitted to the regulators for review and approval, and field characterization and assessment will be in process on 13 operable units. By the end of FY 1996, 41 RI/FS or RFI/CMS work plans will have been submitted to the regulators for review and approval, 25 operable units will be undergoing characterization and assessment, and seven operable units will be undergoing remediation.

Figure 3.4.6 provides anticipated funding needs, broken out by fiscal year, priority, and activity phase.

Additional information on each of the Hanford aggregate areas is presented in Attachment B.

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 Estimates of Costs By Priority Level (Thousands of Dollars)

Year	Priority 1		Priority 2		Priority 3		Priority 4		Total	
	A*	C**	A*	C**	A*	C**	A*	C**	A*	C**
FY90	7,996	12,299	60,915	3,150	0	0	0	0	68,911	15,449
FY91B	8,518	14,264	74,634	3,365	0	1,075	0	0	83,152	18,704
FY92	9,450	17,315	161,286	22,210	5,084	6,027	0	4,225	175,820	49,777
FY93	9,475	8,452	207,150	37,524	3,559	9,324	0	5,125	220,184	60,425
FY94	9,530	9,432	258,040	44,827	2,959	8,641	0	9,525	270,529	72,425
FY95	9,275	6,250	281,444	68,965	2,859	2,345	0	10,025	293,578	87,585
FY96	9,100	7,350	296,783	87,940	2,359	723	0	9,525	308,242	105,538
FY92-96 TOTAL	46,830	48,799	1,204,703	261,466	16,820	27,060	0	38,425	1,268,353	375,750
									Grand Total	1,644,103

A* Assessment C** Cleanup

Figure 3.4.6. Funding needs for the Richland Operations Office are projected by phase, fiscal year, and priority.

3.4.7 ROCKY FLATS OFFICE OVERVIEW

A five-phase Environmental Restoration program is being carried out for assessment and cleanup of the Rocky Flats Plant.

The Rocky Flats Plant is a nuclear weapons manufacturing facility currently operated by EG&G for DOE. The Plant is located in Jefferson County, Colorado, at the foot of the Rocky Mountains. It covers a total of approximately 11 square miles, of which 350 acres is used for actual operations. The Plant is located 16 miles northwest of downtown Denver and 12 miles from the surrounding communities of Boulder and Golden. The closest community, Arvada, recently annexed land that borders the DOE property.

The Plant operation involves operating facilities for the recovery of plutonium; managing waste treatment, storage, and shipment for final disposal; operating a chemical laboratory; performing research and development; and providing special support operations for other DOE facilities. In performing these operations, many materials are generated that may be radioactive, mixed, or hazardous waste.

Multiple compliance agreements have been involved in the Environmental Restoration of the Plant, including:

- Compliance Agreement of July 31, 1986, among DOE, EPA, and the State of Colorado seeks to resolve issues related to, and to establish requirements for, hazardous waste, including radioactive mixed waste, compliance at the Rocky Flats Plant, and the establishment of requirements and procedures for investigations, feasibility studies, and remedial/ corrective actions consistent with the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).
- The Agreement in Principle of June 16, 1989, between DOE and the State of Colorado specifies numerous DOE actions and provides for additional technical and financial support for State activities in environmental oversight, monitoring, remediation, emergency response, and health-related initiatives associated with the Rocky Flats Plant.
- The Federal Facility Agreement and Consent Order, also known as the Interagency Agreement (IAG), draft of December 7, 1989, among DOE, EPA, and the State of Colorado, seeks to integrate EPA and State requirements for cleanup under RCRA and CERCLA. The Department expects that this IAG will be finalized in June 1990. The IAG outlines tasks, schedules, milestones, and priorities for investigations, feasibility studies, risk assessments, and interim remedial actions for all inactive waste sites at Rocky Flats. An IAG is required for all federal facilities listed on the CERCLA National Priorities List (NPL). The Rocky Flats Plant was placed on the NPL in 1989.

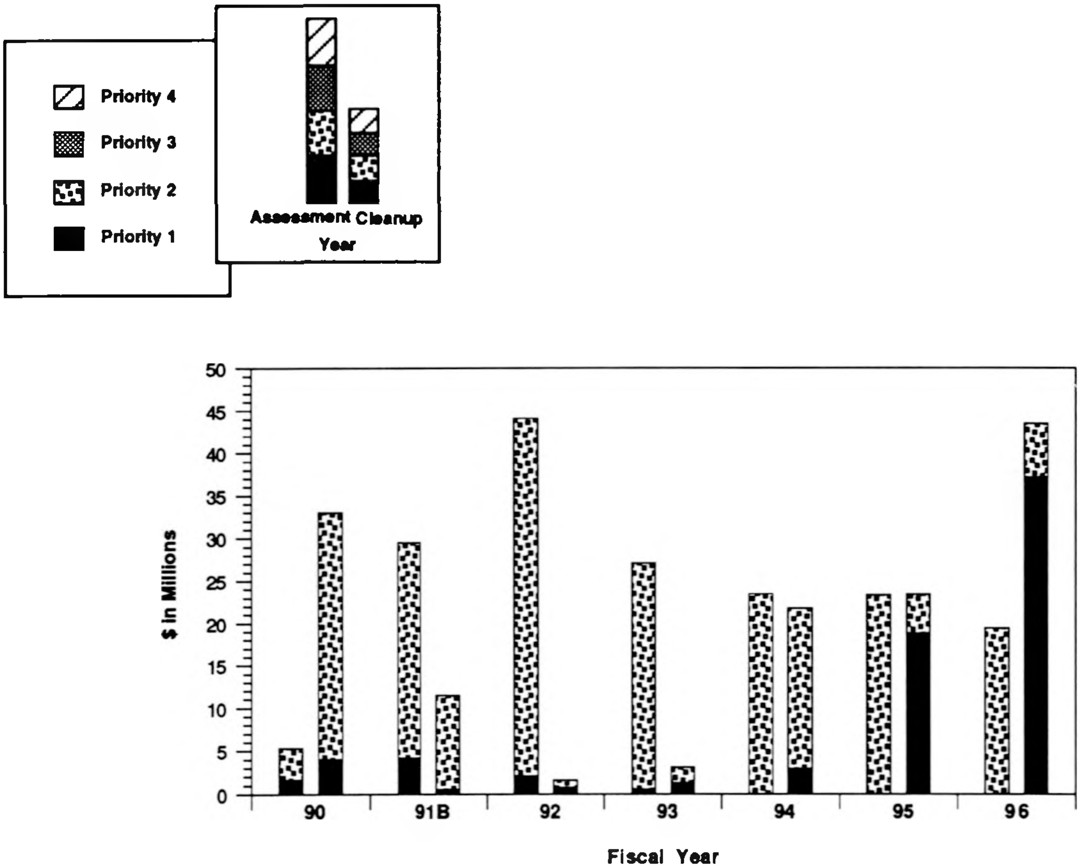
Both radioactive and nonradioactive wastes are generated at the Rocky Flats Plant in the nuclear weapons production process. Current waste-handling practices involve onsite and offsite recycling of waste materials, onsite storage of hazardous and radioactive mixed wastes, and offsite disposal of solid radioactive materials at another DOE facility. Both storage and disposal of hazardous, radioactive, and mixed wastes occurred onsite in the past. Preliminary assessments under the Environmental Restoration Program identified some of the past onsite waste storage and disposal locations as potential sources of environmental contamination. One hundred and seventy-eight sites have been identified at Rocky Flats, including three offsite reservoirs and one land area located off DOE property. The offsite areas may have received contaminated effluent and sediments originating from the Plant. All 178 sites have been grouped into 10 Operable Units.

The Environmental Restoration Program is being implemented in five phases. Phase 1 (Installation Assessment) includes preliminary assessments and site inspections to assess potential environmental concerns. Phase 2 (Remedial Investigations) includes planning and implementation of sampling programs to delineate the magnitude and extent of contamination at specific sites and to evaluate potential contaminant migration pathways. Phase 3 (Feasibility Studies) evaluates remedial alternatives and develops remedial action plans to mitigate environmental problems identified in Phase 2 as needing correction. Phase 4 (Remedial Design/Remedial Action) includes design and implementation of site-specific remedial actions selected on the basis of Phase 3 feasibility studies. Phase 5 (Performance Assessment and Verification) implements monitoring and performance assessments of remedial actions and verifies and documents the adequacy of remedial actions carried out under Phase 4. Phase 1 has already been completed at Rocky Flats, and each operable unit is in a stage of Phases 2, 3, and 4.

Figure 3.4.7 provides anticipated funding needs, broken out by fiscal year, priority, and activity phase.

Additional information on Rocky Flats Plant is presented in Attachment B.

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 Estimates of Costs By Priority Level
(Thousands of Dollars)

Year	Priority 1		Priority 2		Priority 3		Priority 4		Total	
	A*	C**	A*	C**	A*	C**	A*	C**	A*	C**
FY90	1,627	4,052	23,171	28,964	0	0	0	0	24,789	33,016
FY91B	3,716	562	25,309	10,913	0	0	0	0	29,025	11,475
FY92	2,127	731	41,957	877	0	0	0	0	44,084	1,608
FY93	544	1,293	26,552	1,782	0	0	0	0	27,096	3,075
FY94	3	2,973	23,444	18,784	0	0	0	0	23,447	21,757
FY95	0	18,857	23,343	4,564	0	0	0	0	23,343	23,421
FY96	0	37,152	19,405	6,260	0	0	0	0	19,405	43,412
FY92-96 TOTAL	2,674	61,006	134,701	32,267	0	0	0	0	137,375	93,273

A* Assessment   C** Cleanup   Grand Total 230,648

Figure 3.4.7. Funding needs for the Rocky Flats Operations Office are projected by phase, fiscal year, and priority.

3.4.8 SAN FRANCISCO OPERATIONS OFFICE OVERVIEW

The five installations within the jurisdiction of the San Francisco Operations Office (SAN) are faced with a number of diverse Environmental Restoration challenges in the form of inactive waste management units and facilities.

The variety of Environmental Restoration issues being addressed by the five installations under the jurisdiction of SAN is consistent with the diversity of the installations respective missions. Lawrence Livermore National Laboratory (LLNL), by far the largest of SAN's installations, provides scientific support to DOE's Defense Programs. The Energy Technology Engineering Center (ETEC) supports the Nuclear Energy Program. Lawrence Berkeley Laboratory (LBL) and the Stanford Linear Accelerator Center (SLAC) conduct research for DOE's Office of Energy Research. The Laboratory for Energy-Related Health Research (LEHR) at the University of California, Davis, was funded by the Office of Energy Research, but the LEHR research activities ended in 1988. After DOE completes the cleanup of the facility, it will be returned to the University of California, Davis.

The contamination that resulted from operations at these sites includes a wide array of constituents, including a variety of radionuclides, polychlorinated biphenyls, and volatile organic compounds. At LLNL, contaminated groundwater has spread to offsite locations; however, LLNL is taking action to clean up these contaminants. No members of the public are currently being exposed to groundwater contaminants from the facility. No immediate or short-term onsite or offsite health risks have been identified in connection with Environmental Restoration activities at LBL, SLAC, ETEC, or LEHR. One area of commonality for all of the installations is the large number of regulatory bodies with which each must interact. In addition to the Environmental Protection Agency's (EPA's) Regional Office in San Francisco, a number of State, regional, district, and local agencies have jurisdiction over SAN environmental activities. Although the degree of regulatory interaction varies greatly among installations, all work is being performed in a cooperative manner.

The most "formal" regulatory relationship exists at LLNL. In October 1988, a Federal Facility Agreement (FFA) was signed by DOE, EPA, the California Regional Water Quality Control Board, and the California Department of Health Services. In negotiating the agreement, the agencies relied heavily on the FFA model language, which had been negotiated between DOE and EPA Headquarters. The scope of the FFA, which was entered into under Section 120 of the Comprehensive Environmental Response, Compensation, and Liability Act, includes all the remedial assessment and cleanup activities at LLNL. Mandatory schedules for the performance of specific activities are also delineated in the agreement.

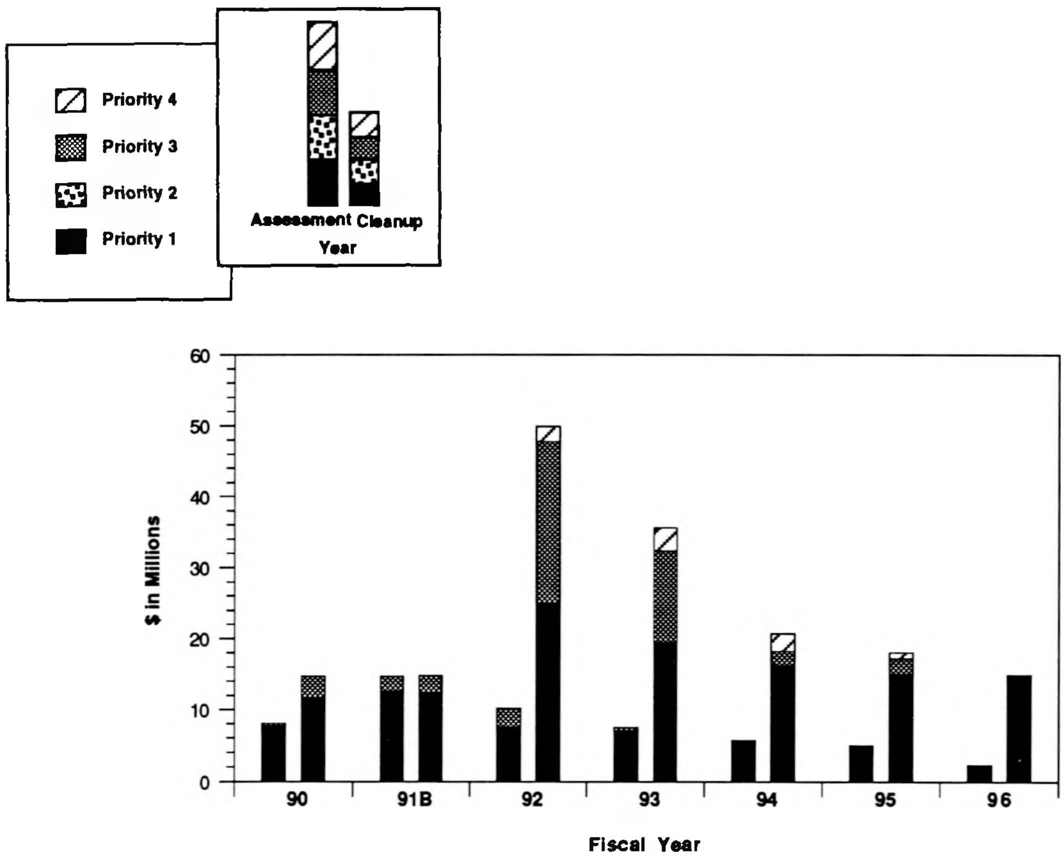
Environmental Restoration activities are currently taking place at all SAN installations. Although much of the work is still in the assessment phase, cleanup activities are taking place at installations such as LLNL. In addition, decontamination and decommissioning of surplus DOE facilities is currently under way at every SAN installation except SLAC.

The Plan calls for much progress to be made over the next five years in the area of Environmental Restoration. By 1996, virtually all assessments are expected to be completed. In addition, many cleanup projects will be either moving toward, or will have reached, completion.

Figure 3.4.8 presents anticipated funding needs, broken out by fiscal year, priority, and activity phase.

Additional information on the SAN installations is presented in Attachment B.

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 Estimates of Costs By Priority Level (Thousands of Dollars)

	Priority 1		Priority 2		Priority 3		Priority 4		Total	
Year	A*	C**	A*	C**	A*	C**	A*	C**	A*	C**
FY90	7,675	11,644	0	0	386	3,062	0	0	8,061	14,706
FY91B	12,635	12,415	0	0	2,042	2,356	0	0	14,677	14,771
FY92	7,618	24,994	0	0	2,480	22,816	82	2,059	10,180	49,869
FY93	7,027	19,500	0	0	480	12,780	0	3,359	7,507	35,639
FY94	5,523	16,250	0	0	180	1,967	0	2,471	5,703	20,688
FY95	4,831	15,000	0	0	180	2,200	0	882	5,011	18,082
FY96	2,141	14,700	0	0	180	150	0	0	2,321	14,850
FY92-96 TOTAL	27,140	90,444	0	0	3,500	39,913	82	8,771	30,722	139,128

A* Assessment C** Cleanup

Grand Total 169,850

Figure 3.4.8. Funding needs for the San Francisco Operations Office are projected by phase, fiscal year, and priority.

3.4.9 SAVANNAH RIVER OPERATIONS OFFICE OVERVIEW

The primary objective of the Savannah River Site (SRS) Environmental Restoration Program, as established by Savannah River Operations Office (SR), is to identify and remediate all inactive waste sites. The Program is designed to comply with all applicable regulations to minimize or mitigate effects on the environment.

SRS is located on 192,000 acres along the Savannah River near Aiken, South Carolina. The primary mission of SRS is to support national security as a major source of reactor-produced materials. The number of Environmental Restoration-related issues at SRS is commensurate with the size of the installation. SRS has an active Environmental Restoration Program that addresses issues in the following areas:

- identification of waste sites,
- investigation to confirm and quantify contamination,
- technology development and demonstration to conduct cleanup,
- installation of postclosure environmental monitoring,
- remedial design and cleanup to restore natural resources, and
- decontamination and decommissioning (D&D) of surplus facilities.

In 1984-1986, $10 million was spent at SRS for the Groundwater Protection Environmental Impact Statement (EIS) to evaluate, by technical analysis and environmental risk analysis method, the magnitude and potential risk associated with most waste sites. This included radioactive, hazardous, and mixed waste sites at SRS and also included remediation needs. Those few sites not covered by this EIS will be tied to it through an Environmental Assessment (EA).

A total of 262 waste management units are currently in the Environmental Restoration Program at SRS. The type of waste units identified at SRS range from nonhazardous waste units to waste units containing both hazardous and radioactive waste. The waste units have been categorized into five groundwater units, three burial grounds, six reactor cooling/purge basins, 12 sanitary sludge sites, three process sewer lines, one storage tank, one sanitary landfill, nine erosion control sites, 27 spill sites, 15 ash piles, 58 seepage/settling basins, 17 surface water units, and 105 disposal piles/pits. Some waste units have included the contamination of surrounding subsurface soils and groundwater. The contaminants identified at various waste units include volatile organic compounds, heavy metals, pesticides, and radionuclides.

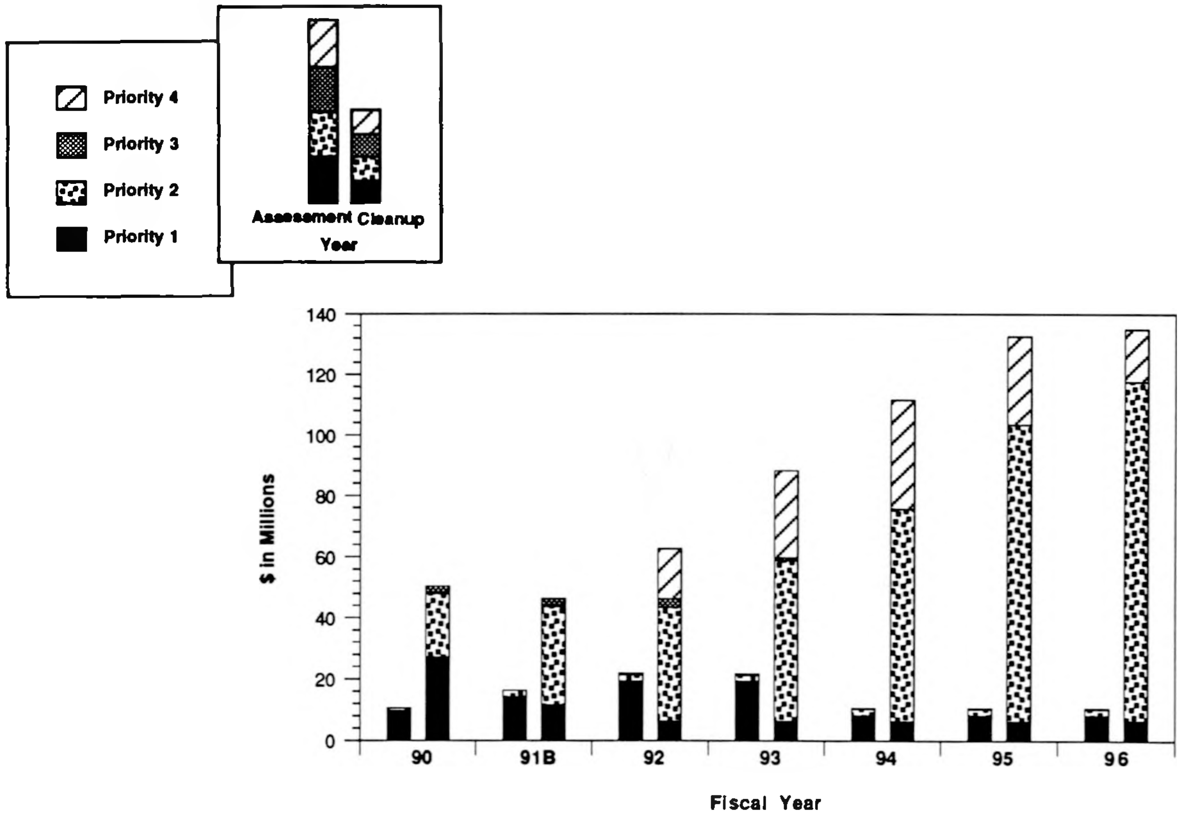
The first priority for FY 1990 at SRS is to complete the Resource Conservation and Recovery Act (RCRA) closure of the M-Area Settling Basin/Lost Lake. Closure certification of this basin is scheduled to be complete in FY 1990. The second priority is the A/M-Area groundwater remediation project. This area poses a potential threat to human health and the environment if left untreated. The other waste area groupings are broken down by RCRA waste site closure, consent order on settlement of the Natural Resource Defense Council lawsuit, investigations, and potential Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) activities. Fifteen RCRA sites, including those sites under the Natural Resource Defense Council consent order, are priority sites for closure.

RCRA has been the primary regulatory driver at SRS. A large number of waste sites will either undergo RCRA closures or are in the RCRA Facility Investigation Program. However, the SRS is currently in the process of negotiating a Federal Facility Agreement with the State and EPA Region IV. It is expected that the agreement will be finalized by the end of FY 1990. As a result of this agreement, all of the waste units will be evaluated to determine if they are regulated under CERCLA. Major facilities that are scheduled to undergo D&D activities during the FY 1990-1995 period include the Heavy Water Component Test Reactor, the old HB Line, the 232F Tritium Facility, and the Reactor Support Facilities. Many of these activities will extend beyond FY 1995. In addition, surveillance and maintenance activities will continue at a number of other facilities.

Figure 3.4.9 provides anticipated funding needs, broken out by fiscal year, priority, and activity phase.

Further information on SRS is provided in Attachment B.

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 Estimates of Costs By Priority Level (Thousands of Dollars)

	Priority 1		Priority 2		Priority 3		Priority 4		Total	
Year	**A***	**C****	**A***	**C****	**A***	**C****	**A***	**C****	**A***	**C****
FY90	9,659	27,025	750	20,912	200	2,316	0	0	10,609	50,253
FY91B	14,244	11,583	2,000	32,100	0	2,500	0	0	16,244	46,183
FY92	19,370	6,344	2,000	37,080	400	2,850	0	16,313	21,770	62,587
FY93	19,277	6,344	2,000	52,550	400	700	0	28,553	21,677	88,147
FY94	8,235	6,450	2,000	69,125	400	240	0	35,813	10,635	111,628
FY95	8,201	6,355	2,000	96,950	400	240	0	29,106	10,601	132,651
FY96	8,249	6,561	2,000	110,950	400	240	0	17,189	10,649	134,940
FY92-96 TOTAL	63,332	32,054	10,000	366,655	2,000	4,270	0	126,974	75,332	529,953

A* Assessment C** Cleanup Grand Total 605,285

Figure 3.4.9. Funding needs for the Savannah River Operations Office are projected by phase, fiscal year, and priority.

4.0

Waste Operations

The treatment, storage, and disposal of wastes
generated as a result of ongoing operations at active facilities;
landlord functions at the Idaho National Engineering Laboratory,
the Hanford Reservation in Richland, Washington, and
the Oak Ridge Gaseous Diffusion Plant in Oak Ridge, Tennessee;
and projects related to the modernization of facilities under the
Office of Environmental Restoration and Waste Management.

4.1.1 OVERVIEW OF DOE WASTE OPERATIONS AND ACCOUNTABILITY

Waste operations embrace ongoing activities throughout DOE's operating complex. DOE's primary purpose is to manage and to account for and dispose of radioactive, hazardous, mixed, and sanitary wastes in a safe and environmentally sound manner.

The Office of Environmental Restoration and Waste Management (EM) has been designated as the focal point for the management and accountability of DOE's overall waste operations. Most waste operations activities have been consolidated under this office, where the philosophy, policy, leadership, and approach to responsible waste management are set for DOE. EM's Office of Waste Operations Division operates the majority of DOE's waste facilities and manages activities as shown in Figure 4.1.1. However, as the figure shows, other DOE organizations generate and handle waste. Each base program is responsible for compliance with waste management orders and regulatory standards and for development of budgets to support their activities. Eventually the waste generated, after being characterized, packaged, and labelled by the producers, is transferred to EM for final treatment, storage, and disposal. All DOE waste producers are required to follow EM established policies and practices in their daily operations. EM must do likewise for internal operations and is responsible for conducting oversight reviews of base program waste management activities.

Accountability means that the Plan provides a vehicle for keeping track of DOE's efforts to safely treat, store, and dispose of the wastes generated and managed throughout the complex. The Plan reports progress on these efforts and on the work needed to achieve environmental regulatory compliance.

Some base program activities are conducted in facilities shared with EM. These are included in the Plan and reported along with all EM progress. By reporting annual status in the Plan, the Department can demonstrate stewardship of public funds and progress toward improved waste management activities.

One of the major DOE waste operations objectives is to effectively manage its processes and facilities in a safe and environmentally responsible manner, encompassing the program missions highlighted in Figure 4.1.1. These missions are essentially the same as described last year and include treatment, storage, disposal, and minimization activities for all types of wastes produced by the DOE complex. Radioactive (high-level, low-level, transuranic, greater-than-class-C, remote handled transuranic, noncertifiable), mixed, hazardous, and sanitary wastes are typical. Reduction of inventories and waste repackaging continue as part of the efforts. It is the responsibility of waste management to ensure that all of these wastes and activities are defined and managed in accordance with applicable regulations promulgated by the Environmental Protection Agency (EPA), the States, DOE, local governments, and municipalities.

Corrective Activities (described in Section 2 of this plan) continue to be the major effort needed to bring DOE facilities into immediate compliance with environmental regulations and laws. Once compliance is attained, continued activities needed to maintain this condition are the responsibility of the operating program, whether it be EM or any of the other base programs.

Currently, waste management practices are enhanced through active reviews and audits designed to establish a clear understanding of the program direction, status of operations, and compliance efforts relative to regulations and other requirements. DOE line organizations, operating contractors, internal audit and Tiger Teams, and outside independent reviewers provide the oversight and "checks and balances" needed to ensure that credible actions are taken and a new culture is truly established.

As described in the FY 1991-1995 Plan, some radioactive wastes remain outside the jurisdiction of EM. The Office of Civilian Radioactive Waste Management continues to be responsible for the disposal of high-level radioactive waste in the Federal repository. However, as before, DOE's contribution to the Nuclear Waste Fund remains part of the plan.

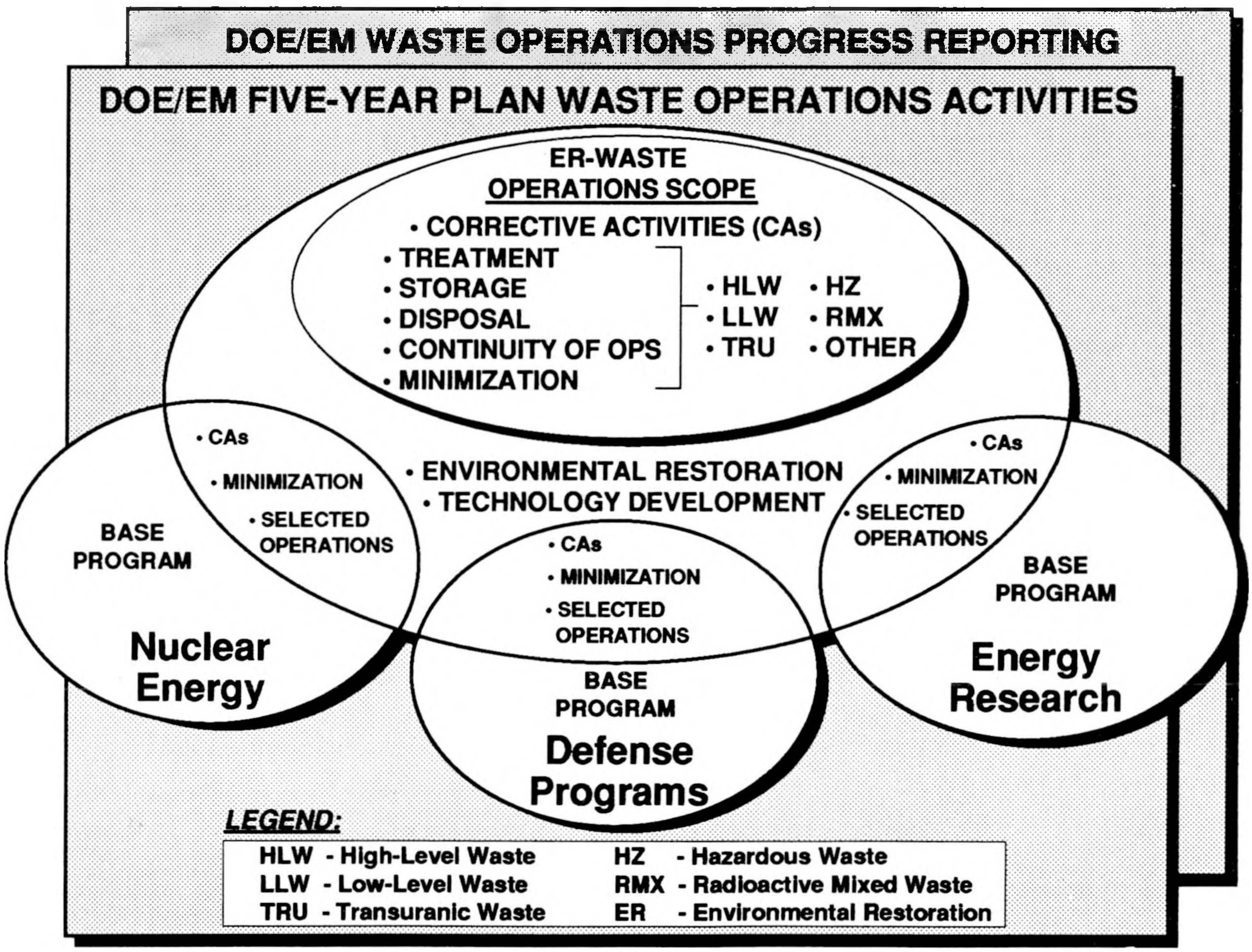


Figure 4.1.1. The Five-Year Plan describes and reports progress for the Office of Environmental Restoration and Waste Management (EM) waste operations and portions of other Department of Energy (DOE) organizations included in the Plan.

4.1.2 DOE APPROACH TO MANAGING WASTE OPERATIONS ACTIVITIES

DOE's approach to managing the Office of Environmental Restoration and Waste Management's (EM's) waste operations activities involves independent management of four major functional elements combined under the Associate Director for Waste Operations.

To manage the EM Waste Operations mission introduced in Section 4.1.1, EM established an Office of Waste Operations (WO) to report directly to the EM Office Director. WO is composed of four divisions focused on (1) Site Operations, (2) Waste Management Projects, (3) Program Support, and (4) Technical Support. Figure 4.1.2 shows the makeup of the Office. Areas of responsibility for each division are described.

1. The Site Operations Division is supported by three functional elements responsible for regional management: (a) an Eastern Operations Branch overseeing Chicago, Oak Ridge, and Savannah River; (b) a Central Operations Branch covering Albuquerque, Rocky Flats, and Idaho; and (c) a Western Operations Branch overseeing Nevada, Richland, and San Francisco.
   - The Division is responsible for aggressively focusing EM resources on safe, environmentally responsible daily operations and maintenance of all WO facilities.
   - The Division must achieve and maintain compliance with applicable Federal, State, Tribal, local, municipal, and DOE regulations governing environmental and waste management activities.
   - The Division is responsible for managing all EM Corrective Activities and providing oversight of all non-EM Corrective Activities managed by Defense Programs, Nuclear Energy, or Energy Research (Section 2.0).

2. The Waste Management Projects Division oversees the majority of the construction projects associated with waste operations.
   - The Division ensures that projects progress efficiently through the design and construction stages and then, through an organized transfer process, ensures "turn over" to the site Operations Division for routine usage.
   - Currently, a number of projects are in progress or nearing completion such as the Defense Waste Processing Facility, the Hanford Waste Vitrification Plant, and the Idaho National Engineering Laboratory Waste Experimental Reduction Facility. Exceptions do occur, for example, the Savannah River Cooling Tower Project is being managed by Defense Programs because it is classified as a Corrective Activity and is a part of the normal production base program.

3. The Technical Support Division
   - The Technical Support Branch may provide routine assistance to both Site Operations and Waste Management Projects where technical "specialties" are needed. This may include activities such as seismic analysis, safety analysis, and technical reviews.
   - This branch also develops operations standards for transport, storage, and disposal of specific waste types and provides an integrating function to ensure that wastes are managed consistently across the operations complex.

- The Waste Minimization Branch leads the minimization effort for Site Operations and participates in the development of Waste Minimization programs and policy in conjunction with the Office of Technology Development (see Section 5.3.1) and the Office of Environment, Safety and Health.

4. The Program Support Division provides resource management guidance from both a budget and regulatory viewpoint. While the Five-Year Plan does represent the Department's "Plan" for Environmental Restoration and Waste Management, upon completion it must be integrated with the total DOE budget, and eventually the President's budget.
   - The Division's Resource Management Branch provides this integration and acts as the WO liaison Branch with EM-10, the Office of Planning and Resource Management.
   - The Regulatory Compliance Branch provides support in the form of assessments and impact analyses of environmental and/or waste management compliance regulations and legislation on the WO budget and resources.
   - The Regulatory Compliance Branch also reviews and audits field activities for environmental compliance, safety, and quality assurance.

Functionally, the WO charter includes active technical and engineering management of daily on-line maintenance and operations; discussions with State representatives and regulators; preparation of permit applications; compliance with statutes, regulations, and DOE Orders; and acceptance of overall responsibility for worker and public safety and environmental stewardship.

Waste Operations staff, by virtue of their knowledge of the program mission, the results of operational audits, and program reviews, plan and classify the work to be done, both near term and long range, in the four priority classes discussed in Section 1.4. Working with the Office of Management and Budget and the Congress, WO develops budget plans needed to support the identified activities and takes action to notify the Congress of additional resource needs when increased scope or unforeseen conditions dictate.

The Associate Director and Deputy provide direction and management to the Operations Division and ensure that effective integration is occurring with other Department organizations and EM offices.

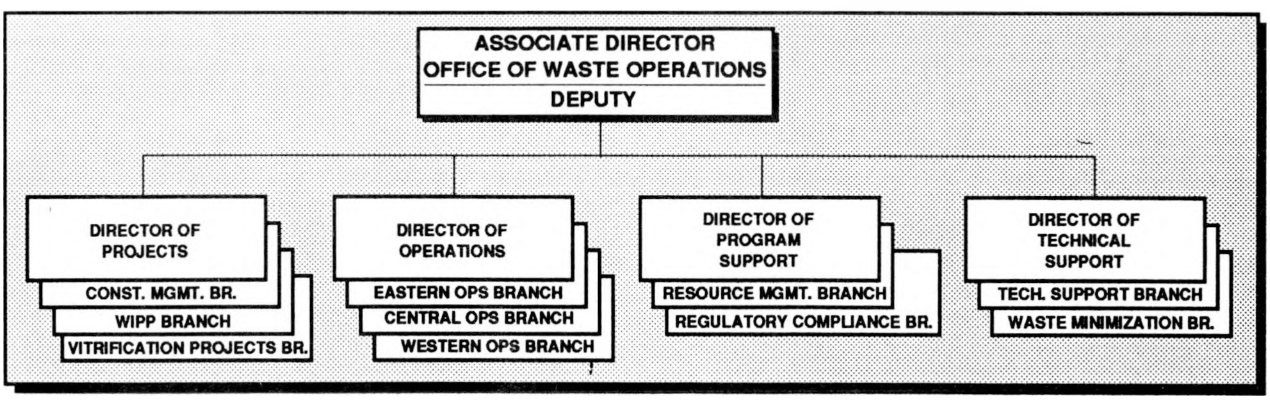


Figure 4.1.2. The Office of Environmental Restoration and Waste Management's Office of Waste Operations is designed to provide four functional areas of management.

4.1.3 DOE ORGANIZATION OF WASTE OPERATIONS ACTIVITIES INTO PROGRAMS

The Office of Environmental Restoration and Waste Management's (EM's) Office of Waste Operations (WO) accounts for Waste Operations activities in five categories: treatment, storage, disposal, minimization, and continuity of operations. This year's Plan describes how common work activities are grouped together to form "programs."

The FY 1991-1995 Plan described waste management activities in each of six major accounting categories: treatment, storage, disposal, applied research and development (R&D), minimization, and continuity of operations. This year R&D has been transferred to the Office of Technology Development. These categories are used by the Office of Management and Budget (OMB) and the Congress to keep track of funds spent by DOE. Coincidentally, these categories are also applied to the Environmental Protection Agency, the Department of Defense (DOD), and others and allow the Congress to track the total amount of funds being spent on environmental programs.

DOE organizes waste operations activities into groups called "Programs." Each of the programs contains work that is "costed" under one or more of the accounting categories mentioned above. By organizing the actual work in this fashion, DOE can bring together teams of experts for each of the programs, all of whom can then focus on the unique characteristics associated with the class of waste being managed. The objective, of course, is to deal effectively with these wastes through the various stages of recovery, receipt, handling, processing, stabilization, performance characterization, storage, and eventual disposal. Disposal, as one would expect, represents one of the ultimate goals of the Department, but embodied in this goal are a host of subtier objectives such as reduction of waste toxicity, improved stabilization, reduced mobility, predictable long-term disposal performance, and responsible operational management along the way.

The primary technical programs presented in this Plan are the high-level, transuranic, low-level, hazardous, and radioactive mixed waste activities. These are discussed further in subsequent sections. As illustrated in Figure 4.1.3, WO establishes the Waste Operations Program missions and the individual Operations Offices manage the programs' components.

Two essential "programs," both of which support all of the primary activities in the Waste Operations mission, are continuity of operations and waste minimization. Continuity of operations represents the daily management, maintenance, and operation of WO installations and facilities. It includes staffing, supplies, and minor waste programs such as sanitary landfill operations.

The second essential "program" is waste minimization. The ideal case would be to generate zero waste, but since that is unattainable, the next best choice is to invest in programs designed to reduce the waste generated to the smallest amount reasonably possible. An integrated minimization program coupled with technology development has become a universal effort on the part of all waste operations activities (Section 5.3.1). EM and the base programs share responsibility for planning and implementation of the minimization program. The base programs, however, bear most of the investment burden since they must budget for and build the facilities that will actually reduce the volume of waste generated.

Another function, though not considered a program, essential to WO operations is something called the "landlord" activity. Landlord activities include things necessary to keep a site or facility open for program operations. These include utilities, security services, bus transportation, the fire department, and all such housekeeping and basic services needed to support the technical programs. Landlord responsibilities are assigned to the dominant DOE Program for the operating site under consideration; for example, Defense Programs is the "landlord" for Savannah River, a production site. As reflected in this FY 1992-1996 Plan, EM has been assigned landlord responsibility for Idaho National Engineering Laboratory (INEL), Richland, and the Oak Ridge Gaseous Diffusion Plant; others may be added in the future.

Figure 4.1.3 shows that all DOE field offices have responsibilities in four of the five primary waste programs. Idaho (including West Valley), Richland, and Savannah River carry additional responsibilities for the management of high-level wastes accumulated at their sites. Finally, all of these Programs are supported by the Office of Technology Development and hope to realize reduced operating costs and better waste form performance as a result of advanced treatment, storage, and disposal techniques.

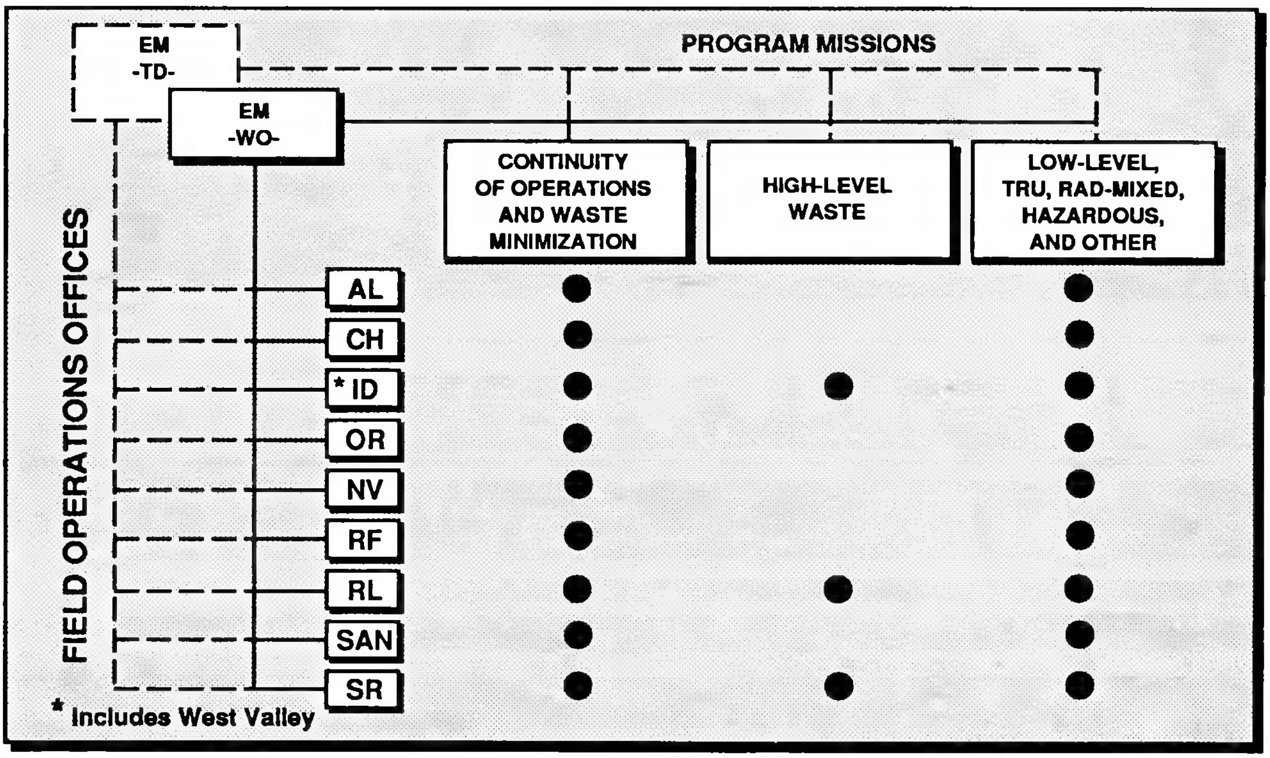


Figure 4.1.3. Department of Energy Waste Operation Program Missions are assigned to field offices by the Office of Environmental Restoration and Waste Management's Office of Waste Operations (EM-WO). EM Technology Development (TD) provides research and development (R&D) support. (TRU = transuranic, RAD = radioactive, WV = West Valley, AL = Albuquerque Operations Office, CH = Chicago Operations Office, ID = Idaho Operations Office, OR = Oak Ridge Operations Office, NV = Nevada Operations Office, RF = Rocky Flats Operations Office, RL = Richland Operations Office, SAN = San Francisco Operations Office, SR = Savannah River Operations Office)

4.1.4 SCOPE, GOALS, AND FUNDING SUMMARY

The principal goal of the Office of Environmental Restoration and Waste Management's Office of Waste Operations (WO) is to demonstrate and practice safe and environmentally acceptable methods of waste treatment, storage, and disposal (T/S/D). Funding estimates have been proposed to support this goal, continuity of operations, and extended efforts to minimize the amount of new waste generated.

The scope of the WO is to accept waste produced by the Department's processing, manufacturing, and research activities and to manage this waste using appropriate T/S/D technologies. Two major Waste Operations goals are (1) to ensure that workers, the general public, and the environment are adequately protected from the hazards associated with the waste materials and (2) to ensure that all operations are conducted in compliance with applicable Federal, State, DOE, and local regulations, including waste implementation of the terms and conditions of environmental compliance described in agreements signed with Federal and State agencies, the National Environmental Policy Act, DOE Safety Orders, and the highest levels of Nuclear Quality Assurance standards.

Aside from managing waste materials on a daily basis, another fundamental goal of WO is to achieve real reductions in the volume and toxicity of hazardous, mixed, radioactive, and sanitary waste generated by DOE's activities. Waste minimization programs are promoted at all DOE sites to assist the generators with detailed planning and implementation. Initiatives such as employee training and incentives, substitution of nonhazardous solvents, and better housekeeping practices are part of the WO promotion and will eventually result in a minimization policy for application throughout DOE. In addition, WO actively supports the Technology Development Programs designed to develop longer-term waste reduction, such as modifying existing manufacturing lines or process flow sheets (Section 5.3.1.). Because WO is not the prime generator of waste, but rather acts on wastes received, the direct WO minimization budgets will always be modest compared to the base program investments needed to change processes or equipment or to build new facilities.

Another major goal of WO is to provide T/S/D capacity to accommodate both the waste currently stored and waste expected from future operations. Factors that increase the complexity and urgency of planning for adequate T/S/D needs are many and include (1) the requirement to treat the hazardous component and radioactive mixed waste under the Resource Conservation and Recovery Act Land Disposal Restrictions, (2) the uncertainty surrounding the nature and volume of wastes generated by Environmental Restoration activities, (3) the influence of the currently planned Programmatic Environmental Impact Statement on all Five-Year Plan activities, and (4) the ever-growing list of new regulatory requirements both external and internal to DOE.

WO has many specific near-term program objectives scheduled to occur during the period covered by this Plan. These can be used to measure our progress in attaining the basic program goals discussed above.

WO's active pursuit of current plans for managing high-level radioactive waste is a goal about to become reality. High-level radioactive waste vitrification facilities in South Carolina, New York, and Washington are at various stages of design, construction, and startup. In West Valley, New York, thousands of gallons of radioactive waste have already been treated in preparation for final solidification. In FY 1992 in South Carolina, WO plans to begin processing high-level radioactive waste into a glass waste form that will meet all applicable specifications for deep geologic disposal.

WO goals for transuranic waste operations encompass treatment and handling facilities at Savannah River, Idaho, Oak Ridge, Richland, and Rocky Flats and storage at the Waste Isolation Pilot Plant (Section 4.3.1).

Radioactive mixed waste goals include treatment by incineration at Idaho and Oak Ridge. Incineration will also be applied to hazardous wastes at Oak Ridge and Savannah River.

Figure 4.1.4a presents graphically many of the near-term program objectives for WO. They involve advances in T/S/D at many DOE sites. Although planned to occur on the schedules shown, some may slip for various reasons. The program must face and deal with uncertainties in the regulatory area (e.g., evolving requirements and standards), the environmental area (e.g., NEPA review schedule and comments), the fiscal area (e.g., availability of appropriated funds), and the institutional area (e.g., WIPP land withdrawal legislation). Additional milestones are listed in Attachment C for each Operations Office or major facility.

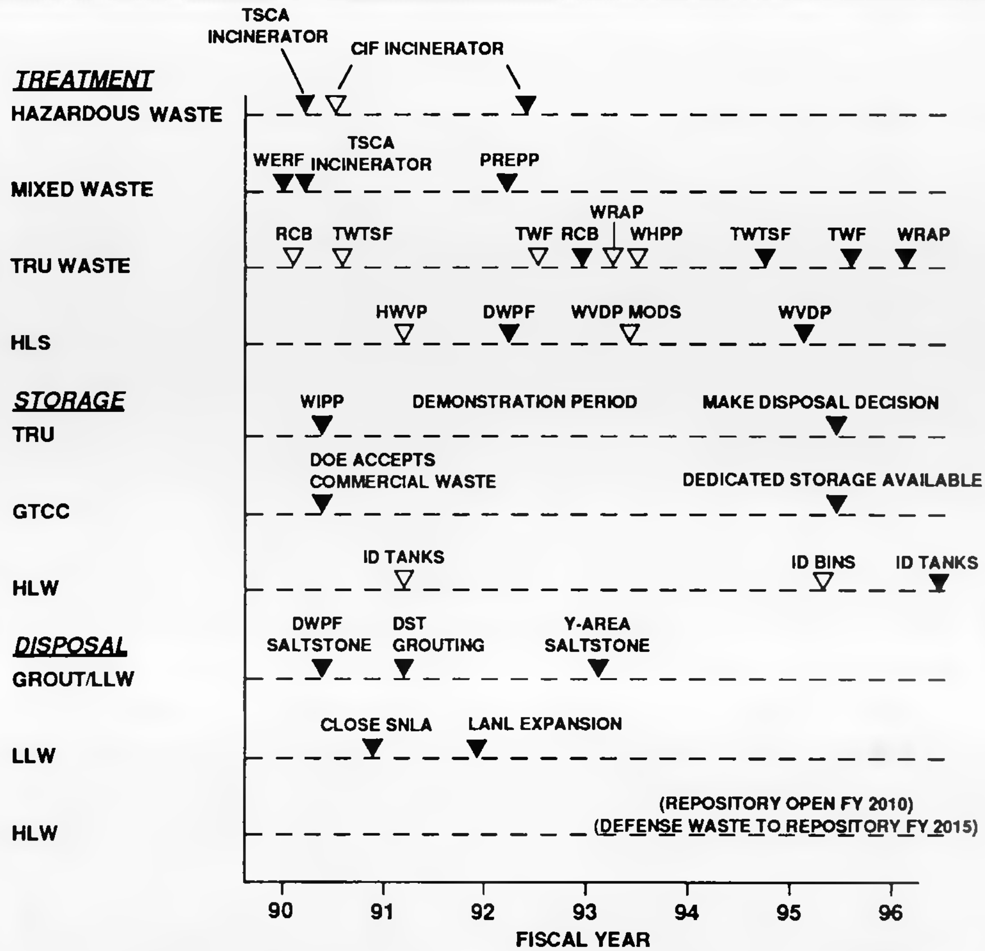
Future WO goals include assuming a leadership role in the international waste management community and becoming actively involved in site public participation programs. WO personnel will continue to participate in international meetings, technical symposia, and public hearings. Further exchanges are planned with members of local communities and the local school systems to provide educational opportunities to the public on waste management practices at the DOE operating sites.

Estimates of funding for WO activities are profiled in Figures 4.1.4b and 4.1.4c. Significant growth in funding requirements has been identified and will be a difficult challenge for DOE, the regulators, and the industry to manage effectively to achieve mutual goals. Such estimates include both validated and unvalidated amounts (Section 1.2).

As is evident from these cost estimates, the totals more than double during the period of this Plan. If the funds made available by the Congress for this program are significantly less than the estimates, some prioritized cutbacks will have to be made. Depending on the size of the shortfall, some delays may have to be accepted to the current schedules for bringing new facilities into operation. In accordance with our prioritization system, protection of the public and worker health and safety and the environment will be ensured first, avoiding situations in which DOE or its employees would be subject to criminal or civil penalties next.

It is hoped that sufficient appropriations will be available to comply with all established agreements between DOE and the Federal and/or State regulatory organizations. If the maintenance of out-year milestones in these agreements is not possible, DOE would alert the affected parties and invoke the established conflict resolution or negotiation process.

One of the questions that came up during the Stakeholder Forum, discussed in the Foreword and in Section 1.15, concerned how much of the WO program was devoted to supporting continued weapon production. Sections 4.2, 4.3, 4.4.1, and 4.6 discuss the volume of high-level, transuranic, low-level, and low-level radioactive mixed waste currently in inventory and the amount generated annually. Even if all of the newly generated waste were attributed to weapons production (which is not true), it would only amount to three percent of the existing inventory. The planned T/S/D capacity and facilities would still be needed to deal with the existing legacy. An attempt to more directly address this issue will be considered in the FY 1993-1997 Five-Year Plan.

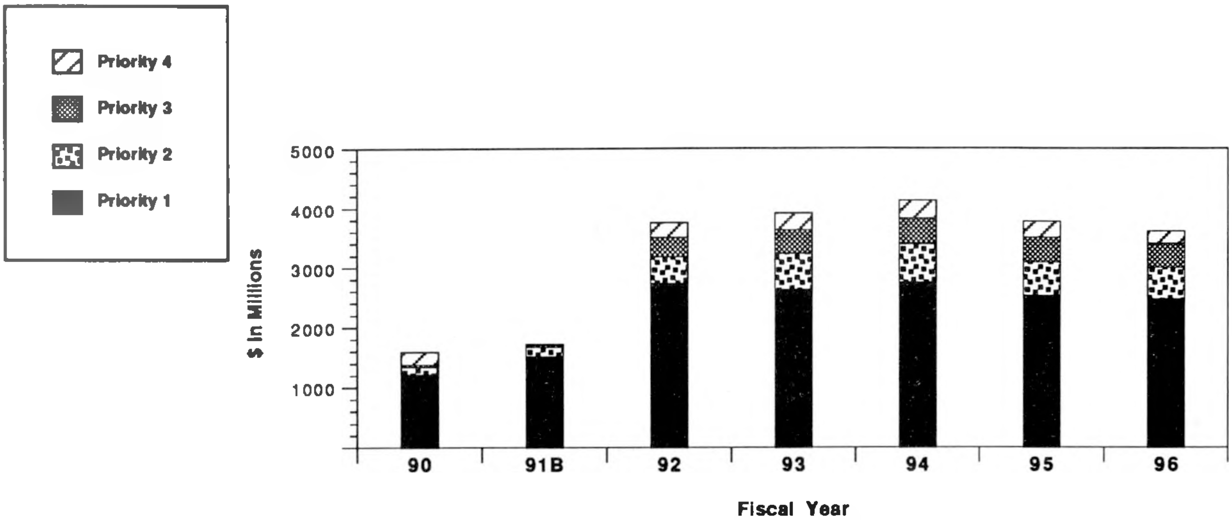


CIF	Consolidated Incinerator Facility (SR)	BG	Burial Ground
DWPF	Defense Waste Processing Facility (SR)	DST	Double Shell Tank Waste (RI)
HWVP	Hanford Waste Vitrification Plant (RL)	GTCC	Greater-than-Class-C Waste
PREPP	Processing Experimental Pilot Plant (ID)	HLW	High-Level Waste
RCB	Retrieval Containment Building (ID)	LANL	Los Alamos National Laboratory (AL)
TSCA	Toxic Substance Control Act	LLW	Low-Level Waste
TWF	Transuranic Waste Facility (SR)	TRU	Transuranic Waste
WERF	Waste Experimental Reduction Facility (ID)	TWTSF	Tru Waste Treatment and Storage Facility (ID)
WHPP	Waste Handling and Packaging Plant (OR)	SNLA	Sandia National Laboratories (AL)
WRAP	Waste Receiving and Processing Plant (RI)	WIPP	Waste Isolation Pilot Plan-Albuquerque (AL)
WVDP	West Valley Demonstration Project (ID)	KEY: ▽	Construction Start
		▼	Operations

*Uncertain pending final Secretarial Decision Plan.

Figure 4.1.4.a Waste Management Operations near-term objectives are making major advances in treatment and is progressing from storage to disposal while emphasizing waste minimization.

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.)**



Totals							
Fiscal Year	90	91B	92	93	94	95	96
$ in Millions	1,317.2	1,734,953	3,751.3	3,898.0	4,200.5	3,760.9	3,591.3

Figure 4.1.4b. Waste Management funding and estimated costs are allocated to needs according to four categories of priority.

	Fiscal Year (Thousands of Dollars)						
OFFICE	1990	1991B	1992	1993	1994	1995	1996
Albuquerque	121,924	171,796	409,288	359,582	373,259	343,741	370,340
Chicago	10,916	17,178	19,291	17,627	25,635	25,471	37,568
Headquarters	29,329	81,872	319,600	470,850	468,370	338,280	336,887
Idaho	211,443	278,925	583,564	545,632	506,198	433,822	492,517
Nevada	6,488	8,609	22,824	23,409	25,434	18,774	15,754
Oak Ridge	142,805	137,663	456,793	482,445	653,436	608,577	547,465
Richland	324,709	499,667	1,047,740	1,085,559	1,155,479	1,063,099	895,655
Rocky Flats	76,267	47,292	118,293	156,524	147,964	142,365	129,042
San Francisco	18,925	15,716	53,774	88,929	78,753	58,130	48,024
Savannah River.	374,396	476,235	720,172	667,404	766,002	728,684	718,070
TOTAL	1,317,202	1,734,953	3,751,339	3,897,961	4,200,530	3,760,943	3,591,322

Figure 4.1.4c. Waste Management funding and estimated costs are allocated among nine Operations Offices and Department of Energy Headquarters.

4.2 OVERVIEW OF HIGH-LEVEL WASTE PROGRAM ACTIVITIES

The Office of Environmental Restoration and Waste Management's (EM's) Office of Waste Operations (WO) focuses high-level waste (HLW) program activities on the conversion of HLW to a stable form suitable for disposal in a Federal repository.

WO is managing the HLW program with the goal of converting all HLW currently stored or being generated into a waste form suitable for disposal in a deep geologic repository. HLW is currently stored at four locations: Savannah River, Idaho, Hanford, and West Valley. Three sites (Savannah River, Hanford, and Idaho) will generate additional wastes in the future. West Valley no longer has the ability to reprocess nuclear fuel and thus generate HLW.

The sites generating HLW treat the raw waste for interim storage. At Savannah River and Hanford, interim treatment involves neutralization of the acidic waste, resulting in a sludge phase composed of insoluble oxides, hydroxides, and a concentrated liquid phase containing soluble radionuclides. At Hanford, some HLW has been further processed by evaporation and ion exchange of the liquid phase to reduce the volume and the potential for leaks to the environment. At Idaho, the acid waste is calcined to produce a granular solid, which is stored in shielded stainless steel bins.

At the present time about 385,000 cubic meters of HLW containing approximately 1.2 billion curies is stored at the four locations (Figure 4.2a). Approximately 250 cubic meters of HLW is added to this inventory annually. Interim storage of sludges, precipitated salts, and concentrated salt solutions at Savannah River and Hanford is done primarily in double-shell tanks. At the Idaho Site, design and construction of new HLW storage tanks meeting Resource Conservation and Recovery Act requirements will begin in FY 1991 and will achieve operational status in FY 1997. Construction of additional calcine storage bins for Idaho will be funded in FY 1995.

At Hanford, a facility previously used to process N-Reactor fuel to recover nuclear materials for weapon production and other purposes, is proposed to be transferred to the EM program. This is the Plutonium Uranium Extraction (PUREX) and Uranium Oxide (UO_3) complex. This complex of facilities is planned to be transferred following completion of the final campaign to recover weapon-grade materials. It will then be available for use in managing the remaining nonweapon-grade fuel at Hanford.

The long-term HLW treatment and storage program consists of waste retrieval from tanks and bins, pretreatment for volume reduction, conversion to a durable form (glass or ceramic) suitable for disposal in the Federal repository, and technology development support for these activities and for waste form qualification. Interim storage after conversion will be required until the repository is opened, which has now been delayed seven years from 2003 to 2010.

Final treatment facilities are being constructed at Savannah River and West Valley to produce borosilicate glass, a waste form expected to meet waste acceptance specifications for the HLW repository. These facilities will use a high-temperature, liquid-fed ceramic melter that converts the radioactive waste into a glass matrix. The Defense Waste Processing Facility at Savannah River has begun nonradioactive testing, and radioactive operations are scheduled to start in 1992. The West Valley facility is scheduled to start vitrifying wastes in 1995 and will process all HLW at the site in 18 months. West Valley is currently pretreating the liquid phase by removing the radionuclides through an ion exchange process. Approximately 60 percent of the cesium (four million curies), which is about 427,100 gallons, has been treated to date. The treated liquid, with the radionuclides removed, is transferred to the low-level waste process for disposal in cementation grout, thus saving millions of dollars in storage and disposal costs.

The Hanford Vitrification Facility is in the detailed design stage. Construction will begin in FY 1991, with startup scheduled for in 1999. Figure 4.2b summarizes the planned operating time frames for the three vitrification facilities. Near the turn of the century, Idaho will begin the design of the fourth DOE HLW treatment facility. The Idaho National Engineering Laboratory waste form may not be borosilicate glass, but an advanced glass/ceramic. The chemical nature of the Idaho calcine tends to reduce the "load capacity" of borosilicate glass and thus requires an "advanced" form to accommodate the current and future Idaho inventory. Plans are to select a final waste form for Idaho in FY 1994 and begin design of the final treatment facility in FY 2002.

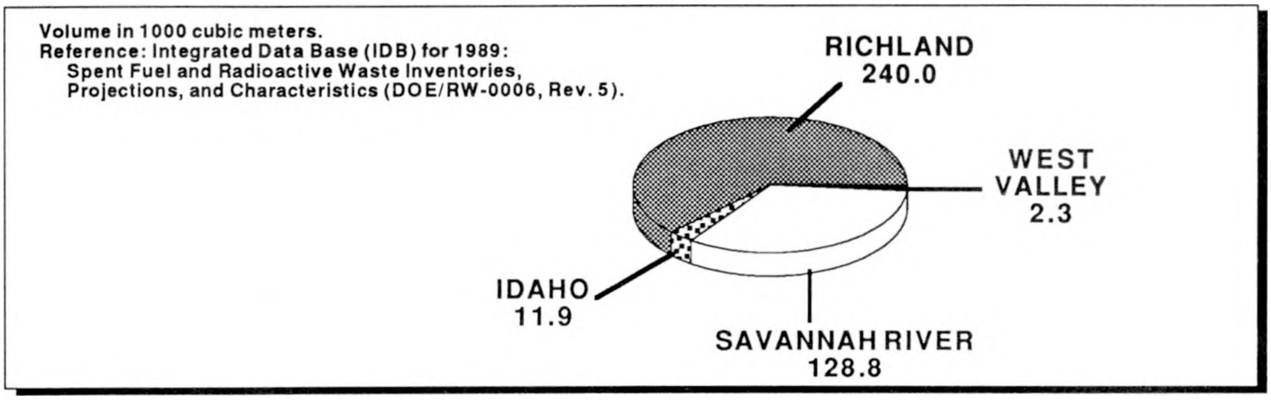


Figure 4.2a. Total volume of high-level waste by Operations Office or location through 1988.

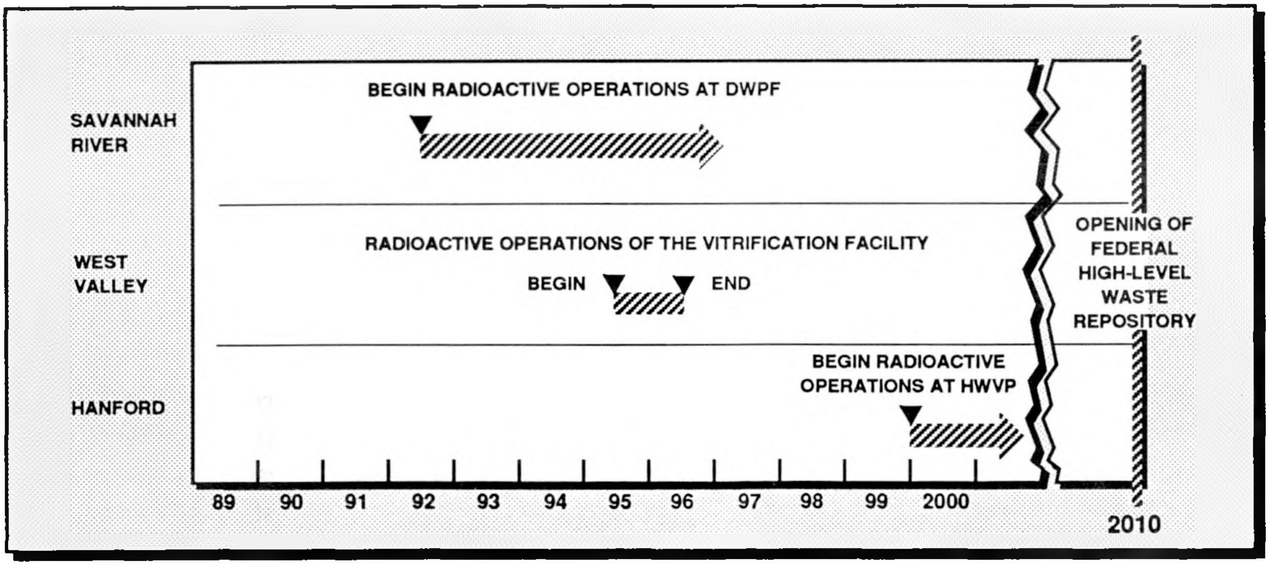


Figure 4.2b. Time frames are shown for operation of the Savannah River, West Valley, and Hanford vitrification facilities. (DWPF = Defense Waste Processing Facility, HWVP = Hanford Waste Vitrification Plant)

4.3 OVERVIEW OF TRANSURANIC WASTE PROGRAM ACTIVITIES

Significant events in the past year have caused delays in implementing DOE's disposal strategy for transuranic (TRU) waste management. DOE is also reassessing requirements for mixed TRU waste storage.

TRU waste is waste that contains more than 100 nanocuries per gram of alpha-emitting transuranium radionuclides (e.g., plutonium) with half-lives greater than 20 years. Presently, DOE has about 59,680 cubic meters of TRU waste in storage and is adding about 2,500 cubic meters each year.

For nearly 20 years DOE's principal strategy for managing TRU wastes has been based on the development of a geologic repository, and for over 10 years the focus of this effort has been the Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico. Faced with mounting issues affecting the withdrawal of land around the WIPP site and concerns over environmental, safety, and regulatory documentation, the Secretary of Energy decided to reevaluate requirements for the opening of WIPP. The Secretary's reevaluation of the WIPP schedule led to the Draft Decision Plan (Section 4.3.1), which identifies the prerequisites for initiating the WIPP test phase.

Responding to delays in the WIPP site opening, the Governor of Idaho announced that he would no longer allow TRU wastes from other DOE sites to continue to be received for storage at the Idaho National Engineering Laboratory (INEL). (See Section 4.3.2.) With over 35,000 cubic meters of TRU waste in storage, INEL operates DOE's largest TRU waste management program and has served as the storage location for DOE's largest TRU waste generator, the Rocky Flats Plant (Figure 4.3).

With the Governor's ban on shipment of TRU wastes, closure of INEL for interim storage and a significant delay in opening WIPP, TRU waste operations at all sites have been impacted. Finding alternative storage locations for Rocky Flats TRU wastes, as well as activities to support the WIPP Draft Decision Plan, has been the focus of DOE task forces and the subject of several meetings between DOE and State governments.

Another impact to DOE's TRU waste management system has been the dual regulatory requirements that are applicable to mixed TRU wastes, which are TRU wastes also containing hazardous waste constituents as defined by the Environmental Protection Agency's (EPA's) Resource Conservation and Recovery Act (RCRA) regulations. This difference in approach is apparent in the contradictions between EPA's proposed regulations for TRU and high-level wastes (40 CFR 191) and RCRA. A key element of the RCRA regulations is the Land Disposal Restrictions, which prohibit the disposal of certain untreated hazardous materials either in or on the land unless it can be demonstrated to a reasonable degree of certainty that there will be no migration of hazardous constituents for as long as the waste remains hazardous. In contrast, the approach used in 40 CFR 191 assumes that over 10,000 years some fraction of the wastes will migrate but restricts the amount that can be released. EPA has not yet provided guidance to resolve differences in regulations and waste management approaches. To comply with existing regulatory requirements, DOE has prepared a RCRA "No Migration Variance Petition" for WIPP. Although DOE believes EPA will grant this variance, the uncertainty is reflected in increased costs for TRU waste management.

Several DOE sites have proposed new incinerators to treat the RCRA components of TRU mixed waste. Estimated construction costs for these new facilities will exceed $300 million, with total operating and construction costs likely to exceed $1 billion. While DOE has not yet approved construction of all of these new facilities, the facilities have been identified in this Plan, and some of the funds have been requested in FY 1992 and outyears.

All DOE TRU waste storage site facilities were designed for long-term storage, but most were developed before RCRA was enacted. While these facilities meet the intent of the RCRA regulations for controlled storage, many do not provide the aisle-spacing requirements for the passage of equipment and inspections. While not all of DOE's TRU wastes are mixed, the cost for retrieving, analyzing, and segregating the wastes and for constructing new storage facilities will likely exceed $200 million.

Another aspect of the TRU waste management system is finding an appropriate disposal method for the small volume of classified wastes (less than one percent of the total). While classified information is controlled on a "need to know" basis, DOE also recognizes that it must provide assurances that classified waste management operations are being conducted in accordance with applicable Federal and State environmental laws and regulations. To address this issue, DOE has requested that several States obtain DOE security clearances for some of their regulatory personnel, thereby ensuring compliance with both environmental regulations and national security requirements.

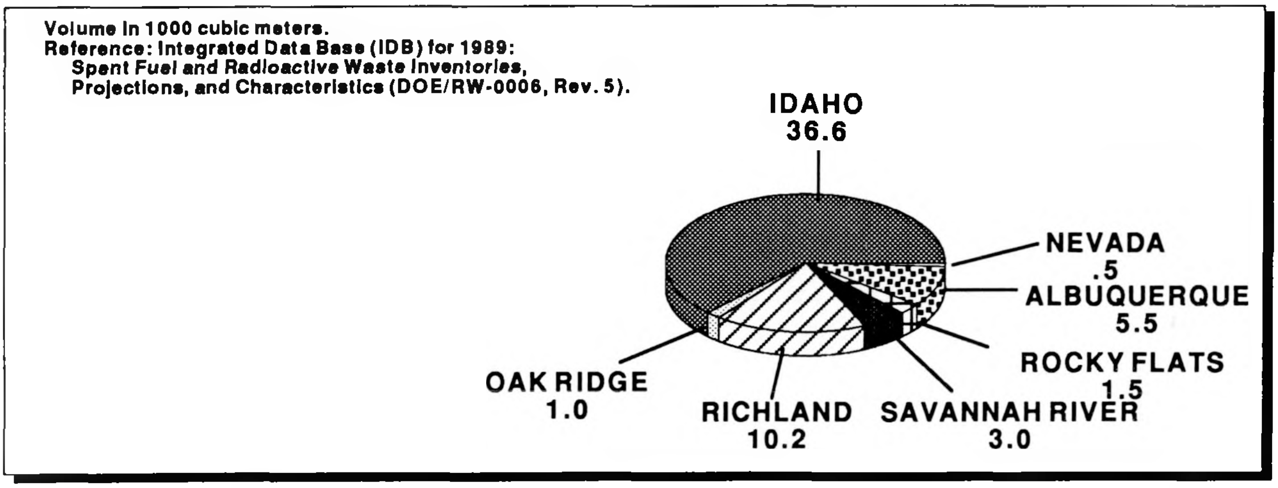


Figure 4.3. The majority of the Department's retrievably located transuranic wastes are located at the Idaho National Engineering Laboratory. Neither the Chicago nor the San Francisco Operations Offices currently has long-term storage capability.

4.3.1 DRAFT DECISION PLAN FOR THE WASTE ISOLATION PILOT PLANT

DOE has developed a Draft Decision Plan for the Waste Isolation Pilot Plant (WIPP) that identifies the prerequisites for beginning the Test Phase.

In October 1989, the Secretary of Energy issued a Draft Decision Plan for WIPP that identified those activities that need to be completed before WIPP can begin receiving waste for the Test Phase. In addition, the Plan identifies the process for conducting these activities and a best estimate of the schedules for completing them. Given the number and nature of the external reviews and the participants contributing to WIPP, coupled with the uncertainties involved in the timing and outcome of several of the activities, the Secretary recognized the uncertainty in the schedule. Therefore, the Decision Plan was issued as a draft and will remain in draft form until the uncertainties have been reduced.

The Decision Plan is updated monthly and distributed to the appropriate congressional committees, governors, other Federal agencies, interested groups, and individuals. With each issuance, recipients are offered the opportunity to provide comments or suggestions that are reviewed and incorporated appropriately into the next revision.

Organizationally, the Plan is divided into three activity group schedules: technical/internal, technical/external, and institutional. Each group includes a number of activities and schedules that have a major role in the opening of WIPP for Test Phase waste receipt. One of the most valuable facets of the Plan is its ability to display the interfaces between the activities, identify the current critical path(s), and document progress to date.

Areas currently considered as high risks to the successful opening of WIPP include issuance of the No-Migration Variance by the Environmental Protection Agency (EPA), Land Withdrawal, Final Safety Analysis Report approval, and institutional issues such as State of New Mexico Regulatory Authority for Resource Conservation and Recovery Act waste. All of these areas have the potential of delaying WIPP and, consequently, are receiving focused management attention and resources.

One of the current major milestones is the mid-June 1990 Secretary's decision point, when the Secretary is expected to announce the date for the facility's readiness to accept waste for the Test Phase. This date would be when the appropriate prerequisites will be completed and the Secretary can make a decision on the facility's readiness. It is also worth noting that the waste receipt date referenced in the Plan is for the Test Phase. A decision as to whether disposal operations can commence at WIPP will not be made until the Department can successfully demonstrate compliance with the EPA TRU waste disposal standards and confirm compliance with other applicable requirements as 40 CFR 191 and 40 CFR 268. Currently, the Test Phase is expected to last about five years.

Some of the major accomplishments at WIPP in the last year include issuance of the Supplemental Environmental Impact Statement, receipt of the Nuclear Regulatory Commission Certificate of Compliance for the waste shipment package (TRUPACT II), issuance of the Final Plan for the Test Phase Performance Assessment, completion of the required submittals to EPA in support of the No-Migration Variance process, and the completion of a number of internal and external safety-related reviews.

In summary, the Draft Decision Plan represents a management tool that allows DOE to prioritize and focus its attention and resources on those areas and activities needed to qualify and facilitate the opening of WIPP.

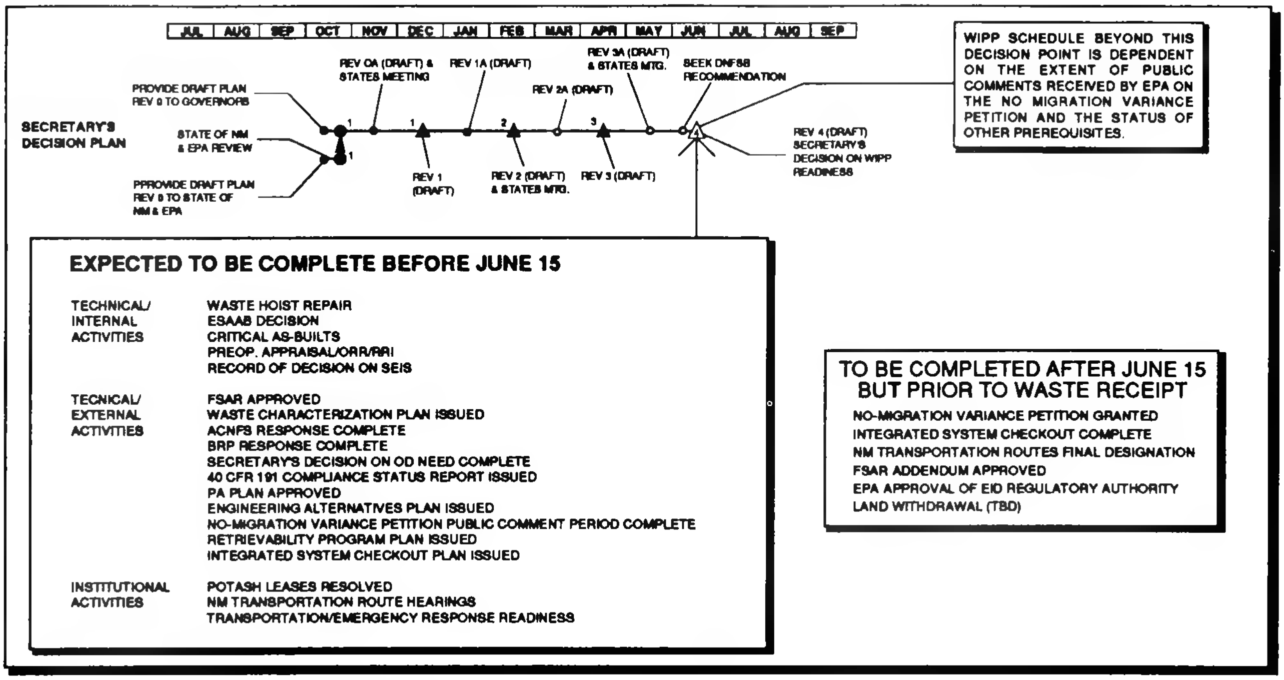


Figure 4.3.1. The Department of Energy has issued a Draft Decision Plan that defines what must be accomplished before waste may be shipped to the Waste Isolation Pilot Plant (WIPP). (TBD = to be determined, EPA = Environmental Protection Agency, FSAR = Final Safety Analysis Report, NMEID = New Mexico Environmental Improvement Division, PA = Preliminary Assessment, SEIS = Supplemental Environmental Impact Statement)

4.3.2 ROCKY FLATS PLANT MIXED TRANSURANIC WASTE ALTERNATIVE STORAGE

A new storage location for mixed transuranic (TRU) wastes generated at the Rocky Flats Plant (RFP) will be used if necessary until the Waste Isolation Pilot Plant (WIPP) is available for disposal.

RFP is part of the nuclear weapons research, development, and production complex that manufactures components for nuclear weapons. Plutonium is used in the process of component fabrication. A by-product of this process is the generation of TRU waste. Some of the TRU waste may also contain Resource Conservation and Recovery Act (RCRA) hazardous wastes, in which case it is called mixed TRU waste. WIPP is being built to allow disposal of TRU wastes, but it is not yet ready to receive waste. Consequently, TRU waste must continue to be stored.

Storage capacity at RFP for mixed TRU waste is limited to 1,601 cubic yards by DOE's permit with the State of Colorado, a limit RFP could reach during 1990. To maximize the use of authorized storage at RFP, several actions are under way. Aggressive efforts to minimize the amount of waste produced are making progress. Better waste characterization is minimizing the amount of waste characterized as mixed TRU, allowing segregation into TRU and low-level fractions that have less restrictive storage/disposal requirements. Finally, a supercompactor is being readied for operation later in 1990. The supercompactor will reduce the waste to about one-half its uncompacted volume. Figure 4.3.2 illustrates the "reserve" capacity achievable through use of the supercompactor. RFP TRU has historically been shipped to DOE's Idaho National Engineering Laboratory (INEL) for interim storage. The State of Idaho closed its borders to waste generated outside of the State. Consequently, until the WIPP is ready to receive TRU wastes, alternative storage locations must be found to keep RFP from exceeding its storage limit.

DOE established the Alternative Storage Task Force to provide a systematic review of the DOE mixed TRU waste management system and to recommend interim storage sites for RFP mixed TRU wastes. Three alternative storage approaches are being pursued:

- store RFP TRU waste at other DOE sites in addition to RFP and INEL,
- establish a commercially owned and operated storage site, or
- store RFP TRU waste at a Department of Defense (DOD) controlled site.

Storing RFP waste at other DOE sites is being pursued as a near-term option, with commercial storage or storage at DOD sites being longer-term options.

DOE briefed the governors of the seven States that host the eight DOE sites that currently handle or have plans to handle TRU waste (Washington, Idaho, Colorado, South Carolina, Tennessee, New Mexico, Nevada) in November 1989 and February 1990. As a near-term option, DOE may propose that each State to take a share of the waste for several years until longer-term storgae could be put in place.

In addition to interim storage at the existing DOE facilities, an option for a commercial storage option is being pursued as a procurement activity. A Commerce Business Daily announcement indicating DOE's intent to issue a request for proposals for a commercial storage site appeared on February 23, 1990. A contract award may occur in September 1990, leading to an operational storage facility in 1993 or 1994.

DOE also requested that DOD assess potential sites for temporary storage of waste from RFP. A joint DOE/DOD task force was formed to screen potential sites and to develop proposed strategies.

DOE is developing the necessary National Environmental Policy Act documentation and safety assessments for the near-term option of storing the waste at various DOE sites. This will be completed before any decisions are made on where to store the RFP waste.

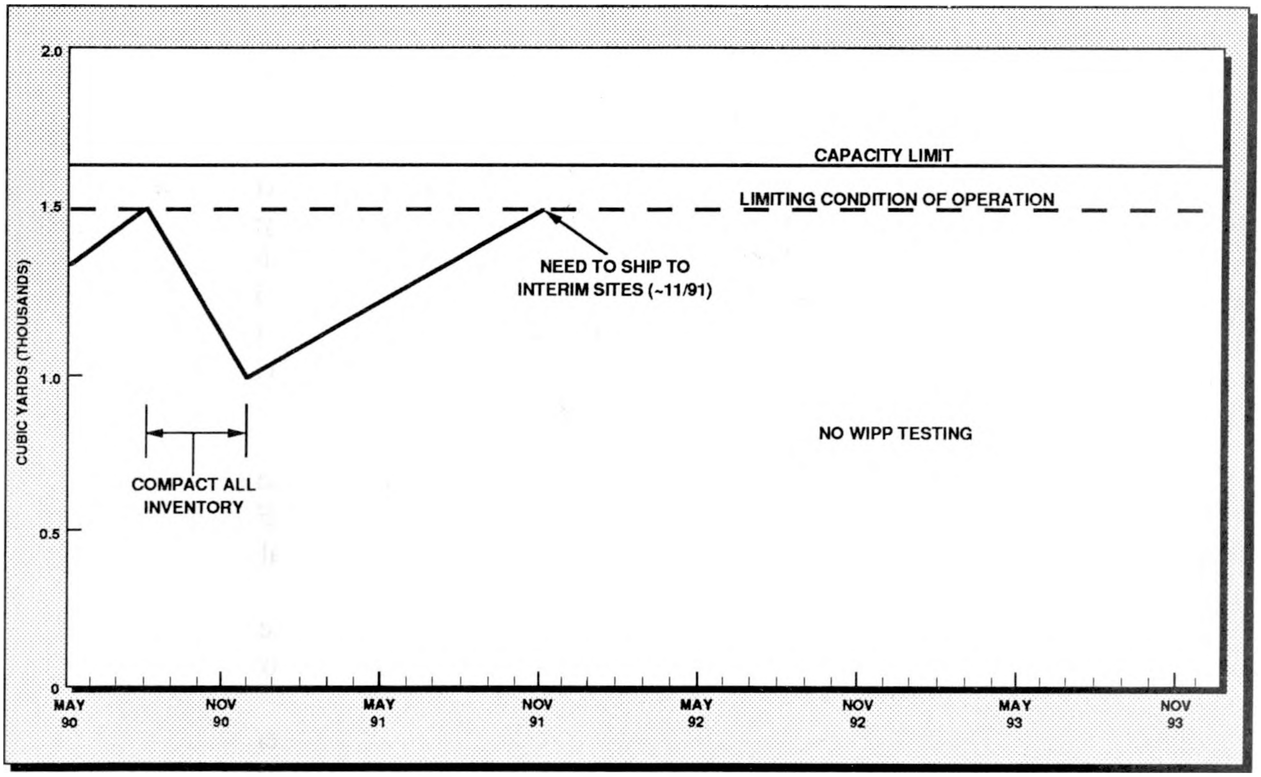


Figure 4.3.2. Rocky Flats Plant waste inventory estimates assume a volume of 70 cubic yards per month until the supercompactor is operational. (WIPP = Waste Isolation Pilot Plant)

4.4 OVERVIEW OF LOW-LEVEL WASTE PROGRAM ACTIVITIES

The management of low-level waste (LLW) is undergoing transition as DOE implements requirements for mixed wastes and assesses needs for future LLW treatment and disposal capacity.

LLW encompasses a broad variety of materials ranging from slightly contaminated soils, clothing, and equipment to highly radioactive spent reactor resins. In general, LLWs are categorized by both the type and concentration of radioactive materials present and the long-term care requirements necessary to effectively manage the wastes. In 1978 the Nuclear Regulatory Commission (NRC) published a report entitled <u>A Classification System for Radwaste Disposal--What Goes Where?</u> (NUREG-0456). The document proposed a systems approach to the management of LLW, which was later adopted by NRC in its 10 CFR 61 regulations and by DOE in its Order 5820.2 (now 5820.2A). However, with the requirements for dual regulation of mixed wastes, DOE generators (as well as NRC licensees) are faced with having to completely reevaluate their LLW management systems.

The differences in regulations between LLW and mixed waste are one reason for the substantial cost increases in LLW treatment, storage, and disposal operations. All currently operating DOE LLW disposal sites contain what are now recognized as mixed wastes. As a result, disposal facility operators are having to retroactively address Resource Conservation and Recovery Act (RCRA) closure plans and requirements for their closed trenches. With typical costs ranging between $100,000 and $1 million per disposal unit, meeting RCRA closure requirements is having a substantial impact on the operators. For new disposal units, operators must ensure that only "pure" LLW wastes are being disposed of. Consequently, waste generators must now analyze their wastes to certify that RCRA-listed wastes are not present. The costs for performing these analyses are conservatively estimated to exceed $25 million in FY 1990 and will increase in later years as more stringent criteria for LLW certifications are implemented.

Determining what is a mixed LLW is not always a matter of analyzing for RCRA constituents. Disposing of lead is one example in which the process of meeting the requirements of RCRA regulations is not always logical. Lead is commonly used for radiation shielding and is a RCRA-listed waste. A radioactively contaminated lead brick is considered a mixed waste, but lead containers used to shield radioactivity may be considered part of the waste package. Even though the quantity of lead involved may be the same, regulatory requirements and, consequently, the systems for managing the waste are very different.

One of the major challenges facing DOE over the next few years will be how to manage LLWs separate from mixed wastes. Due to dual regulation, the costs for managing mixed wastes are higher than for LLW, but, in some instances, the cost savings may not be sufficient to warrant a separation. This is particularly true of many LLW treatment facilities since the costs for construction, permitting, and operation of an LLW incinerator are not substantially different than one for mixed wastes.

Over the next two years, DOE will address "what goes where" issues for all of its generation and disposal sites. In the past, DOE has encouraged generating sites to manage LLW from "cradle to grave" at onsite facilities to the maximum extent possible. This no longer appears practical given both the increased cost for operating treatment and disposal sites as well as the long-term issues associated with closure and monitoring of sites. The preferred options may be for the development of a small number of regionalized waste treatment and disposal centers to facilitate management and quality control as well as to obtain the economic benefits from handling larger volumes of materials. However, regionalization also brings with it the issues of transportation and the obligation of one State to accept for treatment or disposal waste from another State.

Within the next three years, DOE will be preparing a Programmatic Environmental Impact Statement to address the "what goes where" issues and assess requirements for modernization of the Waste Operations complex.

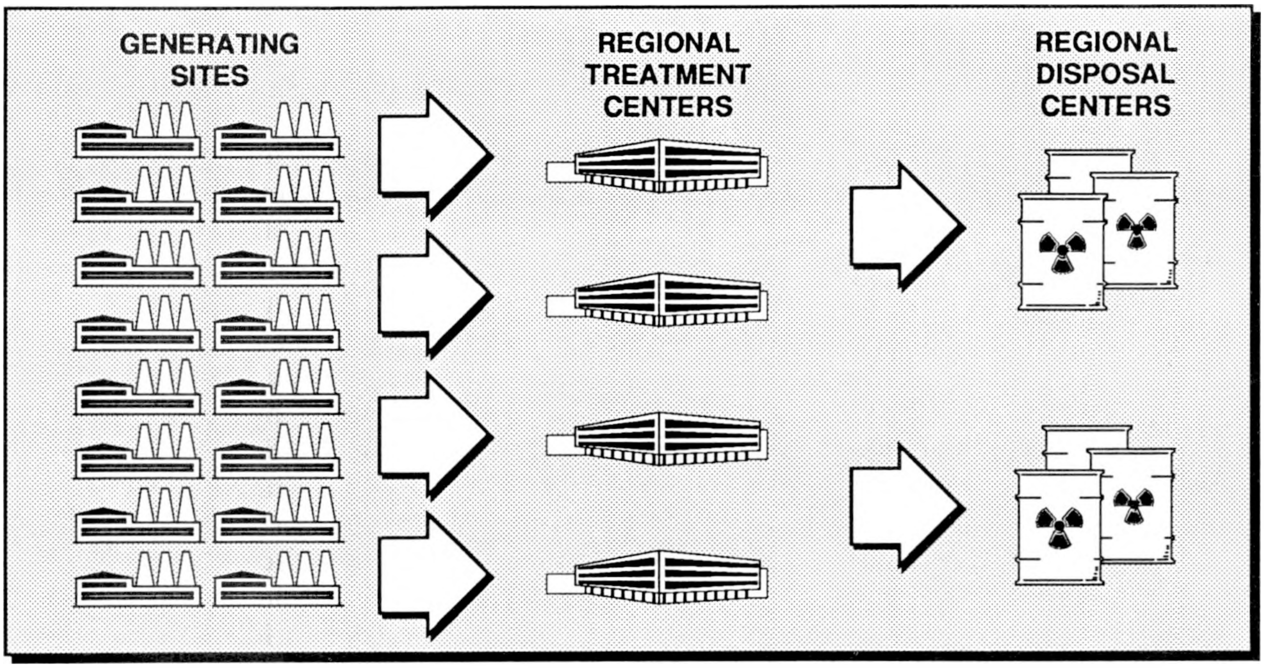


Figure 4.4. Regionalized waste treatment and disposal is one of several concepts that will be considered as the Department of Energy reevaluates long-term requirements.

4.4.1 SOLID LOW-LEVEL WASTE DISPOSAL AND FACILITY PERFORMANCE ASSESSMENTS

Solid low-level wastes (LLW) will continue to be disposed of using proved and improved techniques at selected DOE locations. The methods of disposal and the types of waste accepted are being defined through performance assessments.

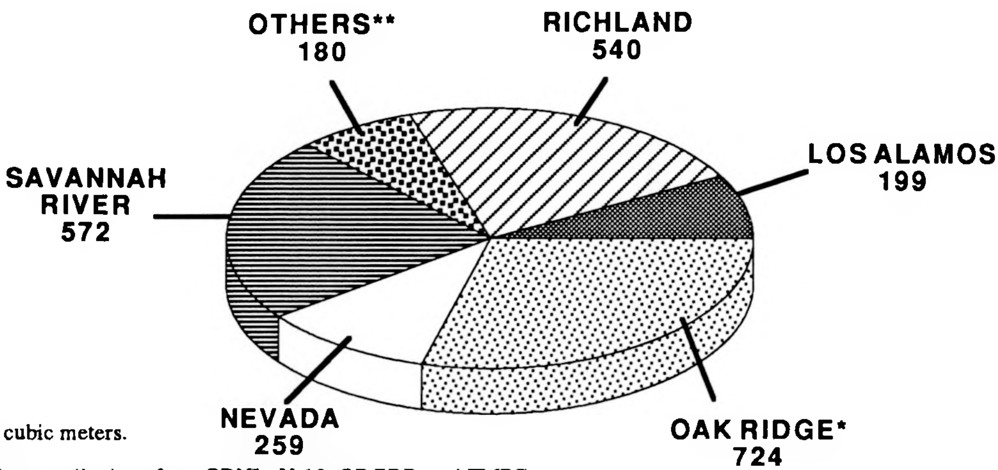
The majority of DOE solid LLW will continue to be disposed of using shallow land disposal. Presently, DOE has about 2,473,000 cubic meters of LLW buried and is adding about 150,000 cubic meters each year (Figure 4.4.1). While several other disposal concepts (such as aboveground vaults) are beginning to be used at some sites, the application of these techniques is not appropriate for all sites. Several comments received on the FY 1991-1995 Plan strongly encouraged DOE to discontinue the use of shallow land disposal in favor of aboveground concepts to facilitate monitoring; other comments discouraged the use of aboveground units because of the long-term costs for monitoring and maintenance.

Although both sets of comments present valid arguments, determining the appropriate method for disposal depends on environmental conditions at the site and on the type and form of waste to be disposed of. As discussed in Section 4.4, the concept of "what goes where" applies in developing a systematic management approach to waste disposal. DOE Order 5820.2A requires all DOE sites to use systematic performance assessments for managing the variety of wastes generated onsite as well as site-specific performance assessments for individual disposal units. For some sites, particularly humid sites with shallow groundwater tables, aboveground disposal units may be preferred. For arid regions, aboveground structures may not be preferred for achieving performance objectives and, in some instances, may actually reduce the long-term performance of the site.

While engineered approaches to waste disposal facility design and waste form are important, DOE recognizes that environmental conditions will dominate performance assessments. In other words, engineering and waste form will only marginally improve the performance of a good site, but marginal sites must be engineered and waste must be treated to achieve performance objectives. DOE is taking steps to reduce the number of operating disposal sites and will be closing any sites that are performing only marginally.

Waste type and form are also important in determining the type of disposal method. The majority of DOE's LLW is contaminated soils, metal equipment parts, paper and cloth products, and salts. Generally, these wastes contain very little radioactivity, and most do not require extensive treatment to meet disposal standards. Also, a small volume of DOE LLW waste contains a substantial amount of radioactivity. Several studies have shown that about 95 percent of the radioactivity is contained in less than five percent of the volume of LLW waste. With these radioactive wastes, special containers and forms, as well as disposal methods, are necessary. The volume of these higher specific-activity wastes are expected to increase as DOE brings new LLW treatment facilities online. For example, paper and cloth can be incinerated to achieve volume reductions of 30 to 1 or more. The resulting ash residues contain higher concentrations of radioactivity and consequently may no longer be acceptable for disposal by sites or by methods that would have accepted the original paper or cloth waste. These changes in the spectrum of wastes being produced represent another example of issues that must be addressed in DOE's re-evaluation of its LLW management system.

The key to DOE's strategy for managing wastes will be through the performance assessments currently under way at all DOE facilities. Disposal unit performance assessments define the limits and waste acceptance criteria for the site and disposal technique employed. The systems performance assessment then matches the type of waste being generated to a site or identifies treatment necessary to meet the site's acceptance criteria. Matching a waste to a treatment method and disposal site is the basis for "what goes where."



Volume in 1,000 cubic meters.

* Oak Ridge includes contributions from ORNL, Y-12, ORGDP, and FMPC.
** Includes contributions from Idaho, WVDP, PORTS, PAD, etc.
Reference: Integrated Data Base (IDB) for 1989: Spent Fuel and Radioactive Waste Inventories, Projections, and Characteristics (DOE/RW-0006, Rev. 5).

Figure 4.4.1. Total volume of low-level waste by Operations Office or location is shown.

4.4.2 COMMERCIAL GREATER-THAN-CLASS-C WASTES

The only solid low-level wastes (LLWs) requiring long-term storage are commercially generated greater-than-Class-C (GTCC) wastes as defined by the Nuclear Regulatory Commission (NRC). DOE is assessing storage requirements for these wastes until a permanent disposal location is approved.

In developing its LLW disposal guidelines for 10 CFR 61, NRC categorized LLWs by concentration. The majority of LLW falls into the lowest concentration category, Class A. Class B and C categories allow higher concentrations of radionuclides but require enhanced packaging and waste form. However, there are GTCC LLWs. Typical GTCC wastes included sealed sources of highly concentrated cesium or strontium used as food and medical irradiators. To effectively manage these wastes requires a special disposal facility that is capable of handling highly radioactive sources and that must also provide for longer-term care than is typically provided by a shallow land disposal site.

The Congress and the States recognized that it was unnecessary to develop and maintain a GTCC facility within each of the LLW Compact regions. In 1985 the Congress passed Public Law 99-240, the Low-Level Radioactive Waste Policy Amendments, which make the Federal government responsible for disposing of GTCC wastes. DOE is the responsible performing agency and has defined a three-part strategy to meet this goal. The first phase is to provide a facility to meet immediate needs for commercial generators who are no longer capable of interim storage. To address any immediate needs, existing DOE facilities would be used beginning in 1990. In December 1989, a survey was made of DOE sites capable of storing GTCC wastes. The ability to manage both contact- and remote-handled wastes for an interim period of three to five years was assumed.

The second phase of the strategy is to provide a centralized dedicated storage facility for all commercial GTCC wastes until an NRC-licensed disposal facility is available. In addition to DOE sites under consideration, privatization and the use of commercial storage locations will also be evaluated. Work is in progress to analyze requirements for packaging, transportation, fee specifications, and treatment requirements. DOE will issue a request for proposals to solicit private sector participation by FY 1991.

The third phase will involve either the transfer of the stored GTCC wastes to a high-level waste repository or development of a separate GTCC disposal facility. In either event, the final disposal of GTCC wastes is not expected until the year 2010. The issues associated with commercial GTCC storage and the survey findings will be prepared for a report for the Congress by the end of FY 1990.

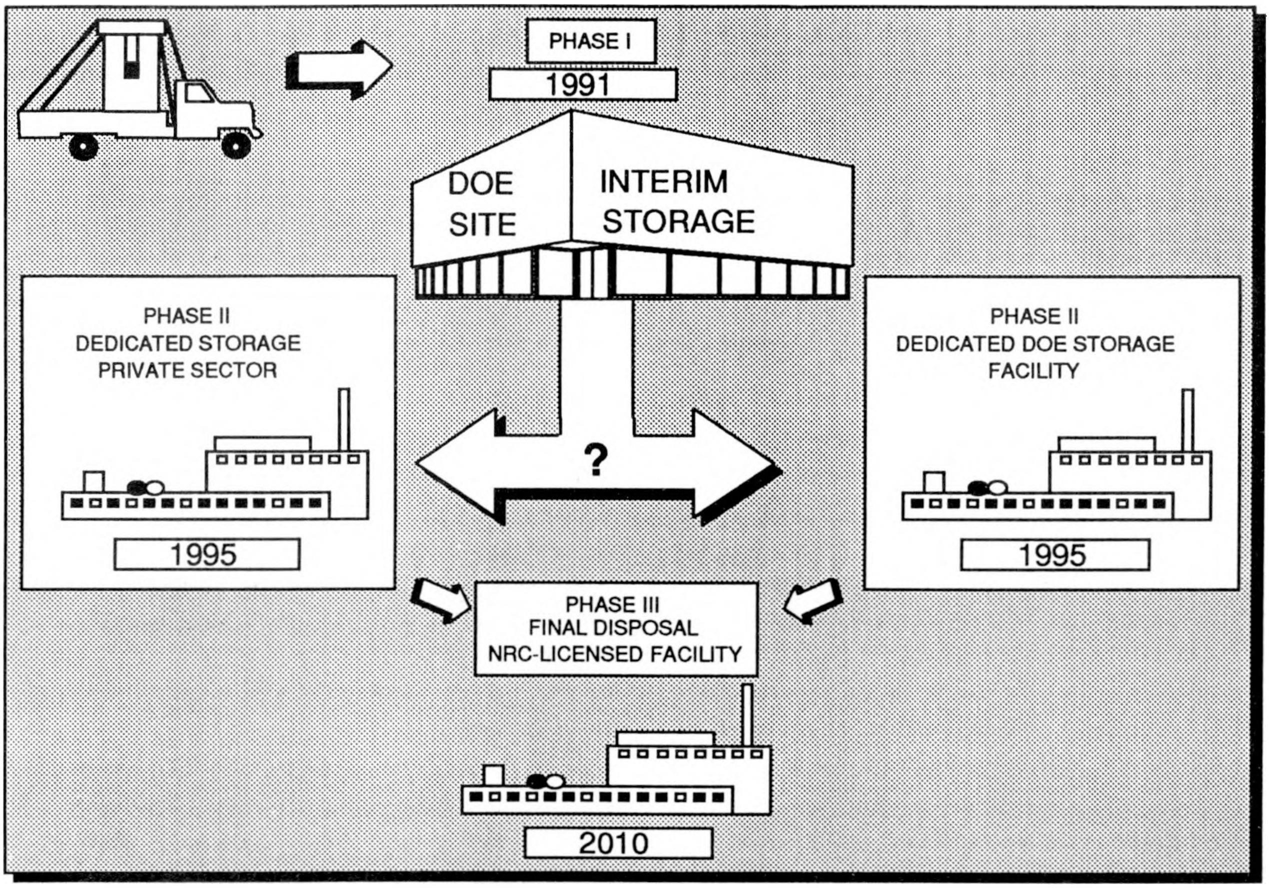


Figure 4.4.2. The Department of Energy strategy for commercial greater-than-class-C wastes is based on a three-phase approach. (NRC = Nuclear Regulatory Commission)

4.4.3 DOE'S GREATER-THAN-CLASS-C EQUIVALENT AND SPECIAL-CASE WASTES

DOE generates a small volume of high specific-activity wastes that are equivalent to the Nuclear Regulatory Commission's (NRC's) greater-than-Class-C (GTCC) classification as well as some special-case wastes that must be managed separately from routine low-level waste (LLW).

Although DOE does not use NRC's classification system, DOE Order 5820.2A requires that LLW equivalent to GTCC be handled as a special case by each site. The volume generated at DOE sites is a small fraction of the total LLW generated but contains a large percentage of the total radioactivity. Examples include sealed sources that have been used in food irradiators, sludge treatment systems, and thermoelectric generators. Another category of GTCC equivalent wastes is transuranic wastes not generated by Defense Program activities and, therefore, not currently scheduled for shipment to the Waste Isolation Pilot Plant.

Another category of special-case wastes is termed "performance limiting" or wastes that cannot be disposed of at a particular site without causing the site to exceed its performance limits. The definition of performance-limiting waste will vary by site and is determined by the site's performance assessment. Most DOE sites employ combinations of waste forms, packaging, and disposal techniques to most systematically manage their wastes. A performance-limiting waste is any waste that cannot be disposed of at that site in a safe and cost-effective manner using the available disposal systems. However, what is unacceptable at one site may be acceptable at another. An example is tritium, a radioactive isotope of hydrogen. Tritiated wastes are usually in the form of radioactive water solidified in concrete. In high concentrations, tritium has unusual physical properties that allow it to readily diffuse and migrate from the waste form and package. As a result, all DOE and commercial shallow land disposal facilities that have disposed of concentrated tritiated wastes have found tritium migration. Only limited amounts of tritium are acceptable for shallow land disposal or emplacement in aboveground vaults, but high-concentration tritium wastes can be effectively managed using greater confinement disposal methods now employed by a few DOE sites.

A category of special-case wastes unique to the Federal government are classified wastes. Classified LLWs are usually generated in the manufacture of weapons components and in research programs such as the Strategic Defense Initiative. DOE currently maintains classified disposal units at several sites to accept these small volumes of waste. While all DOE disposal sites require that classified wastes meet the same waste classification and certification requirements as all routine LLW, there are some obvious limitations in providing information to regulatory and oversight organizations. While classified information is controlled on a "need to know" basis, DOE also recognizes that it must provide assurances that classified waste management operations are being conducted in accordance with applicable Federal and State environmental laws and regulations. To address this issue, DOE has requested that several states obtain DOE security clearances for some of their regulatory personnel, thereby ensuring compliance with both environmental regulations and national security requirements.

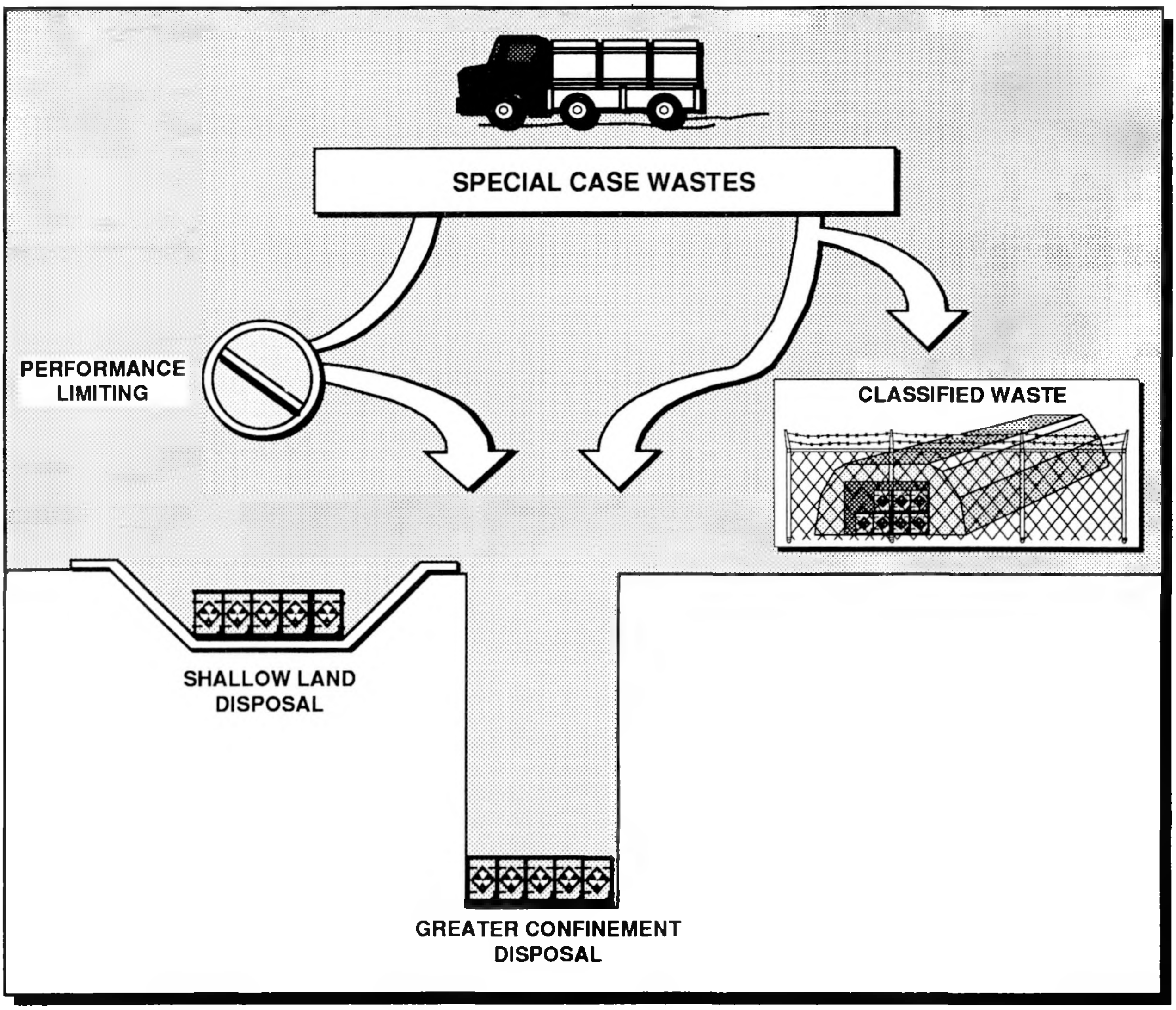


Figure 4.4.3. Performance-limiting and classified wastes are examples of special-case wastes that must be managed separately from routine low-level wastes.

4.5 OVERVIEW OF HAZARDOUS WASTE PROGRAM ACTIVITIES

DOE hazardous waste program activities will result in the minimization, treatment, and disposal of hazardous waste.

Hazardous waste management addresses materials identified as hazardous or requiring regulatory control as stipulated by the Resource Conservation and Recovery Act (RCRA), the Toxic Substances Control Act, and the Clean Water Act. For example, materials such as trichloroethane, polychlorinated biphenyls (PCBs), mercury, and cadmium are classified as hazardous waste. These regulations are interpreted by the States or EPA regions and are applied to local DOE operations. As time goes on, the regulatory agencies steadily increase the number of waste types banned from land disposal without previous treatment. Similarly, disposal facilities must meet increasingly stringent waste acceptance criteria. The DOE hazardous waste program is designed to comply with these regulatory requirements, reduce risk to human health and the environment, and minimize waste generation.

The Office of Environmental Restoration and Waste Management (EM) has a five-point strategy for handling hazardous waste:

1. <u>Avoid hazardous waste generation.</u> The best approach is to minimize and/or eliminate hazardous waste generation. EM currently has programs in place with the objectives of minimizing and eliminating the use of chlorinated solvents in its facilities, for example, nonplutonium operations eliminating the use of carbon tetrachloride at Rocky Flats; recycling mercury waste at Savannah River; and recycling antifreeze at Richland.
2. <u>Treat hazardous waste.</u> DOE's near-term objective is to treat hazardous waste as it is generated, and, thus, avoid additional storage capacity. Two examples are the hazardous waste incinerator at Oak Ridge and the planned incineration facility at Savannah River. Wet oxidation technology is being investigated by Technology Development for specific hazardous waste treatment.
3. <u>Dispose of hazardous waste.</u> DOE disposes of hazardous waste in permitted DOE facilities after minimization and treatment.
4. <u>Use applicable commercial technology.</u> DOE uses the best available technology for hazardous waste treatment, including commercial technology, and intends upgrade as new methods are developed.
5. <u>Control liability.</u> DOE will control liability by using RCRA-permitted DOE treatment, storage, or disposal facilities instead of commercial hazardous waste disposal sites. The number of sites is limited, and only Government waste is accepted.

Figure 4.5 illustrates this strategy. As treatment and minimization efforts increase, the volume of waste disposed of should steadily diminish. Storage, however, will continue to rise to a peak, then diminish steadily as advanced programs get in place for minimization and treatment. Figure 4.5 is only illustrative; actual timing will differ.

When DOE uses licensed commercial facilities for the disposal of its hazardous wastes, priority in selecting a vendor is given to recycling first, treatment second, and final containment and storage last.

The Land Disposal Restriction (LDR) regulations (40 CFR 268) under RCRA require treatment of the hazardous constituent of wastes to specific concentration levels before disposal. Some progress has been made in developing and implementing methods to reduce or eliminate the hazardous component of the waste. For example, Argonne National Laboratory-East (ANL-E) is building a plant to remove chlorides from the waste stream. Lawrence Berkeley Laboratory installed an acid neutralization system for Building 70/70A. Los Alamos is designing a waste treatment facility to recycle lead and waste oil and neutralize plating waste.

In many cases, neither DOE nor industry can meet current and proposed LDR regulations. As a result, available storage will have to increase until technology demonstrates effective methods for reducing the toxicity of the hazardous waste to below established limits. However, LDR regulations prohibit storage of banned waste except to accumulate sufficient quantities to facilitate proper recovery, treatment, or disposal. The Office of Technology Development is funding research for waste minimization and for associated waste treatment to meet these challenges.

Several States having RCRA authority are proposing and establishing more stringent regulations for wastewater discharge. As a result, several DOE sites must upgrade their stormwater discharge areas and industrial waste treatment facilities to meet the new requirements for renewing their National Pollutant Discharge Elimination System permits. The Kansas City Plant will design and construct several stormwater retention areas that will allow stormwater collection, testing, and treatment to remove contaminants before discharge. Mound Laboratory is upgrading all site drainage and will install a stormwater treatment system. The Pantex Plant will upgrade and/or construct new wastewater treatment plants for runoff and site drainage.

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

- continued upgrading and removal of underground storage tanks (USTs) to meet the requirements of 40 CFR 280, (e.g., Idaho has replaced or closed USTs, ANL-E plans to replace nine USTs and to remove and permanently close six others), and
- continued removal of PCB transformers (e.g., ANL-E has replaced all but 18 PCB transformers, which will be removed this year, Richland plans to replace 17 PCB transformers this year).

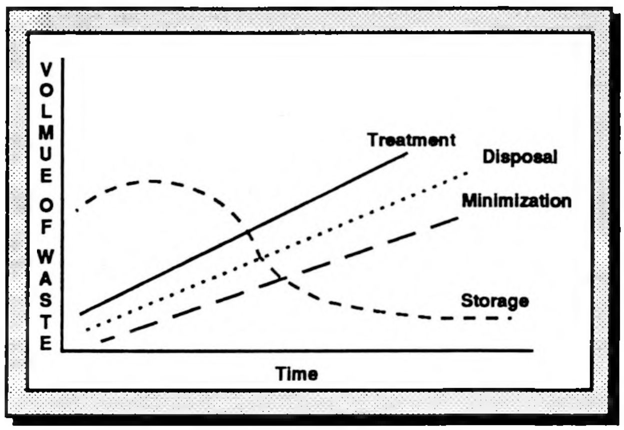


Figure 4.5. The Department of Energy's strategy for hazardous waste management includes avoiding waste generation and increasing waste treatment to reduce storage and disposal of hazardous waste.

4.6 OVERVIEW OF RADIOACTIVE MIXED WASTE PROGRAM ACTIVITIES

Radioactive mixed waste (RMW) program activities will minimize the generation of mixed waste and meet the regulations for treatment, storage, and disposal (T/S/D) for wastes that are generated.

RMW is radioactive waste that is also hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). The presence of both RCRA hazardous waste and radioactive waste means that radioactive mixed waste is subject to the requirements of RCRA as implemented through State and Environmental Protection Agency (EPA) regulations, as well as regulations governing radioactive wastes. As part of the continuing development of RCRA regulations, EPA is promulgating land disposal restrictions (LDRs) (40 CFR 268) on many waste constituents, which must be treated to specific concentration levels or by specified technologies before disposal. In addition, regulations restrict the time that untreated RMW may be stored. Implementing these LDRs for RMW poses difficult problems because of the lack of treatment facilities to handle the radioactive component. EPA has issued a national capacity variance that delays the applicability of the LDR restrictions on certain mixed wastes until May 8, 1992. RMW containing solvent/dioxin and California-list wastes are currently subject to RCRA and LDR requirements.

RMWs are generated at many DOE sites and include all the high-level and a significant portion of the transuranic (TRU) waste as well as most low-level wastes. The RMW program focuses on <u>low-level, non-TRU radioactive mixed wastes</u> and has as its objectives minimizing the generation of RMW and, for the RMW that is generated, the use of T/S/D facilities that comply with State and EPA regulations and DOE Orders.

Most DOE-generated RMW is stored pending treatment. Most RMW storage complies with current regulatory requirements, and all sites have submitted, or are in the process of submitting, RCRA Part B Permit applications.

Figure 4.6 shows current RMW inventories and generation rates. These wastes are composed of materials that are both low-level radioactively contaminated and chemically hazardous. Typically, RMW includes a broad spectrum of contaminated materials, such as air purifiers, cleaning solutions, engine oils, soils, and water treatment chemicals.

Facilities to treat some of the RMW are currently available or planned at some DOE sites. The Hanford Grout Processing Facility has been constructed to treat and dispose of low-level liquid RMW presently stored in underground tanks. This facility will mix the liquid waste with cement-forming materials to form a grout that will be pumped to engineered concrete disposal vaults and allowed to solidify. Processing of RMW is scheduled to begin in FY 1991.

The Waste Experimental Reduction Facility (WERF) incinerator in Idaho is currently operable under an interim status authorization. Its usefulness will be expanded by the addition of off-gas treatment capabilities for incineration of RMW-containing halogens. The upgrades are scheduled for completion in FY 1990, with a trial burn in FY 1991.

The RMW incinerator at Oak Ridge experienced failure of an induction fan during a RCRA trial burn in FY 1989, which has delayed operations. The fan has been replaced, with operation scheduled to begin in FY 1990, pending receipt of the final RCRA permit. The incinerator will process mixed wastes from Paducah, Portsmouth, Fernald, the Oak Ridge Gaseous Diffusion Plant, the Y-12 Plant, and the Oak Ridge National Laboratory.

Los Alamos National Laboratory (LANL) has an incinerator facility--and has another proposed--slated to burn RMW. The facility is not currently in operation, pending completion of technical upgrades and resolution of issues involving regulatory control of radioactive emissions.

The Nevada Test Site (NTS) RMW disposal facility is operating under interim status and is authorized to dispose of RMW generated by the NTS, Rocky Flats Plant, and Sandia National Laboratories-Albuquerque. The facility is also authorized to dispose of classified RMW generated by any DOE site. NTS plans to construct a facility for disposal of RMW other than the low-level, liquid RMW. LANL is also proposing to construct an RMW disposal facility.

FY 1989 Accomplishments:

- A million-gallon test campaign of the Hanford grout facility was conducted.
- A Federal Facility Compliance Agreement was negotiated with EPA and the State of Colorado to address storage of RMW at Rocky Flats Plant.
- Best Demonstrated Available Technology information was submitted to EPA for treatment of four types of RMW:
  - vitrification of high-level waste;
  - solidification of zirconium fines;
  - stabilization/grouting of low-level RMW, specifically the Hanford grout and the Savannah River saltstone; and
  - stabilization of incinerator ash.
- A Toxic Substances Control Act (TSCA) Permit was issued to the Oak Ridge RMW incinerator.
- "DOE Land Disposal Restrictions Strategy Report for Radioactive Mixed Waste" was generated addressing options and recommending a course of action for LDR compliance.

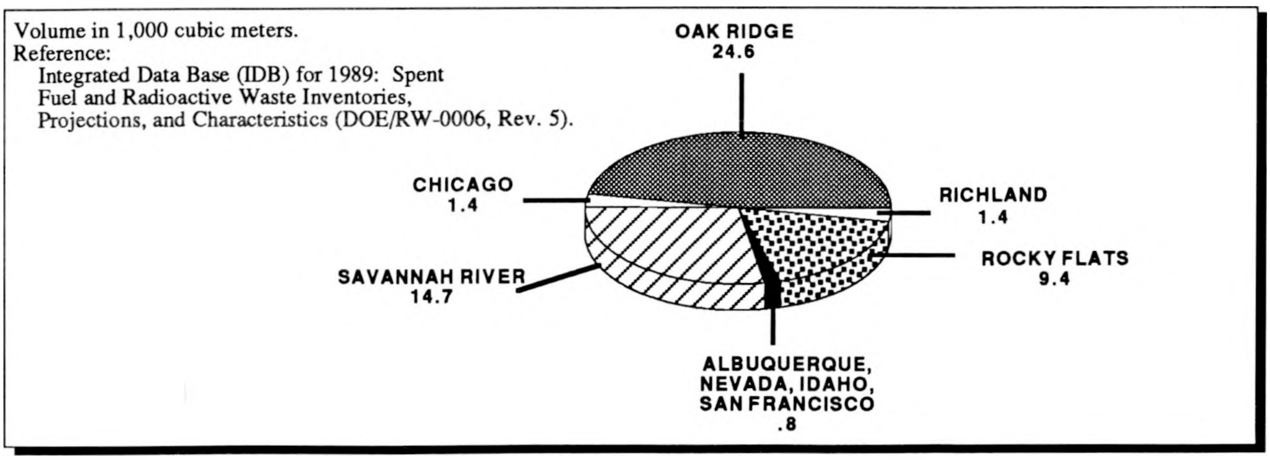


Figure 4.6. Cumulative volume of low-level radioactive mixed waste was 59,140 cubic meters through 1988 at the DOE sites. The annual volume generation rate for 1988 was 12,356 cubic meters.

4.7 TREND SUMMARIES FOR TREATMENT, STORAGE, DISPOSAL, MINIMIZATION, AND OPERATIONS ACTIVITIES

The overall cost estimates for Waste Operations continue to increase primarily because of more restrictive regulatory requirements, expanding knowledge of work scope, and technological complexity of implementing requirements.

The activities consolidated under the new Office of Environmental Restoration and Waste Management's (EM's) office of Waste Operations have experienced many major changes. In part, these changes are due to the transfer of activities from other DOE programs and the need to reprioritize and allocate funds. But the greatest impacts result from DOE's implementation of hazardous waste regulations to radioactive mixed waste treatment, storage, and disposal operations. The overall costs for Waste Operations continue to increase, primarily because of more restrictive regulatory requirements and uncertainties in how to apply these regulations to all phases of operations. In some instances, advanced technologies discussed in Section 5 of this Plan are expected to reduce the long-term costs for Waste Operations. However, for planning purposes, the availability of these technologies is not assumed in the outyear budget estimates.

In preparing Activity Data Sheets for inclusion in the Plan, the tendency has been to include contingency to accommodate changes in regulatory requirements. As an example, DOE waste generators have identified funding requirements for mixed waste sampling, testing, and inspection beyond those that would be normally required for routine hazardous wastes. The more times a mixed waste material is handled, the greater the potential for excessive radiation exposure. Therefore, additional facilities, equipment, and personnel are necessary to ensure exposures are as low as reasonably achievable. While this is only one example of new requirements facing DOE, it represents the differences in approach to managing radioactive and Resource Conservation and Recovery Act (RCRA) wastes.

The figures that accompany this section present estimate breakouts by treatment, storage, disposal, waste minimization, and continuity of operations. Treatment growth trends reflect the bringing into operation of several waste treatment facilities for high-level and mixed waste, as well as plans for new treatment centers [particularly if DOE is required to treat transuranic (TRU) wastes for disposal at the Waste Isolation Pilot Plant (WIPP)]. Depending on the treatment strategy DOE ultimately selects, not all of these proposed treatment facilities would be required, but they have been included to reflect compliance requirements.

Storage is another area where increases are largely due to impacts from the delays in opening WIPP and compliance with RCRA storage facility requirements for mixed TRU wastes. In addition, DOE has only one site operating under interim status for mixed waste disposal; consequently, the majority of DOE sites must store their mixed wastes pending the availability of additional mixed disposal waste sites.

The largest increases in disposal cost are due to mixed waste compliance and the development of new disposal sites at existing DOE facilities. As discussed previously, the costs for sampling and analyzing for mixed waste constituents to categorize a waste as either low level or mixed are continually increasing. Also DOE low-level waste sites are having to retroactively address RCRA closure requirements for older disposal units. New disposal facilities are required for facilities nearing capacity, and the use of more costly aboveground disposal concepts is favored by many regulatory and interest groups.

DOE's commitment to waste minimization is not adequately reflected by the funding growth figure provided. The funds identified are primarily for waste minimization planning and program support. The majority of minimization costs are in implementation, and these activities are the responsibility of the generating programs. DOE is in the process of revising its management system for tracking waste minimization activities. Waste minimization programs are due to be in place by May 1990, and plans describing these programs will be received for review during the summer of 1990. DOE recognizes that minimization activities are still maturing and that the investment being supported today represents only the start of a major effort to significantly reduce the amounts of waste generated over the next five years.

Two-page summaries of Waste Operations activities at all DOE field offices and some individual installations are provided in Appendix C. These summaries give interested readers a quick look at the major activities under way in their area. The summaries provide additional details not discussed in the main text of the Five-Year Plan; however, they do not provide information on all local site activities. More details can be obtained from the Site-Specific Plans prepared by for each DOE Operations Office.

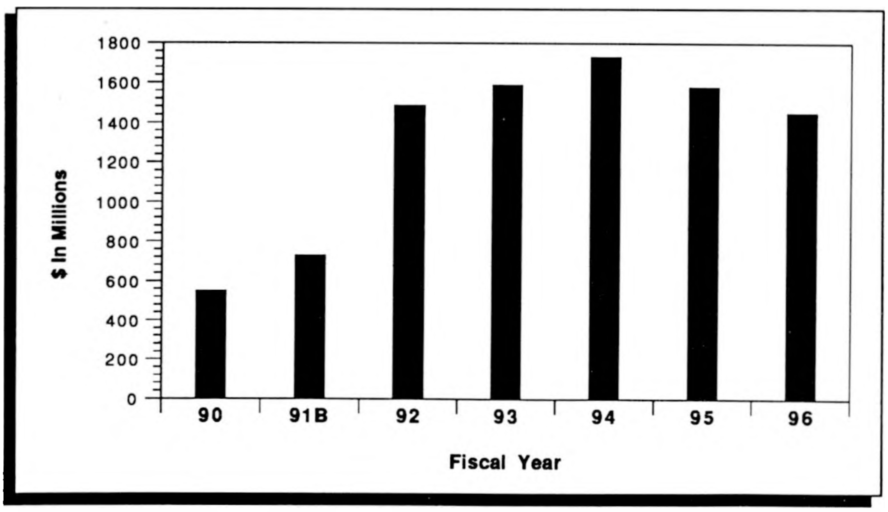


Figure 4.7a.

Treatment cost projections are conservative in view of the variety of strategy options currently under review.

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.)

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.)

Figure 4.7b.

Storage costs will not decline until interested parties reach technical and regulatory agreement on disposal methods and sites.

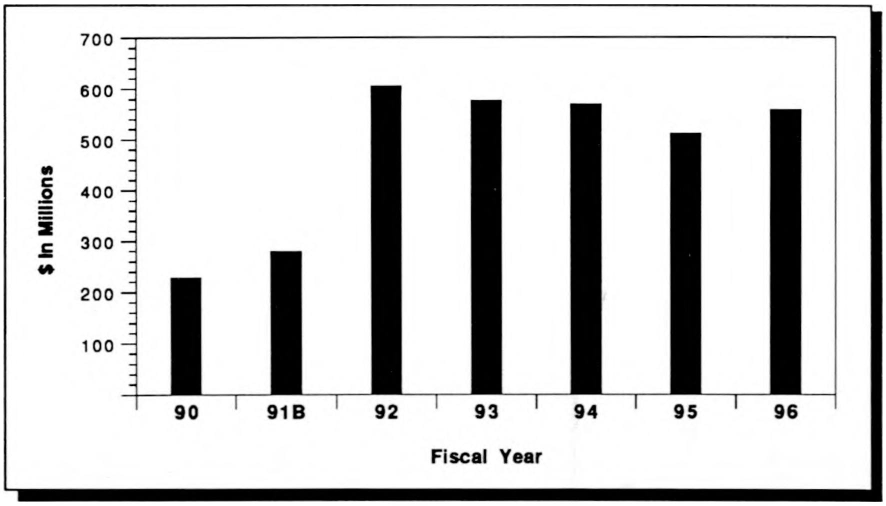


Figure 4.7c.

Disposal costs are growing, principally for new facilities to comply with low-level and mixed waste regulations.

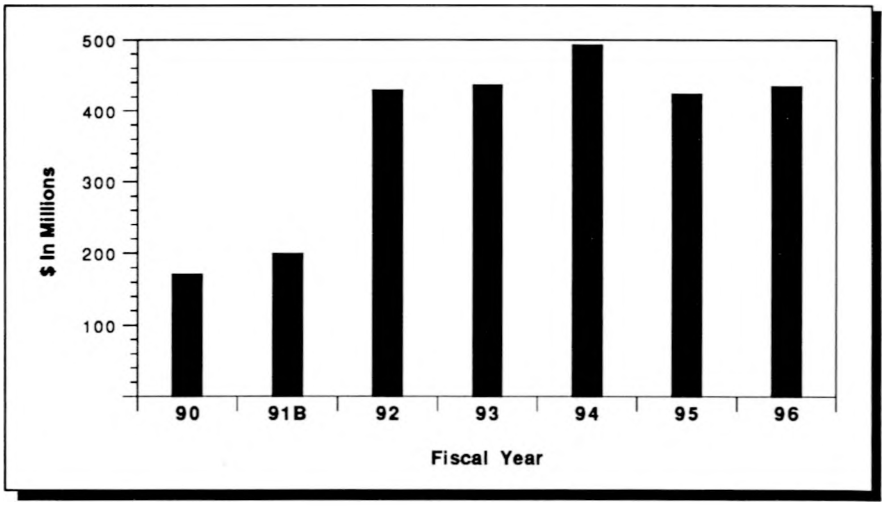
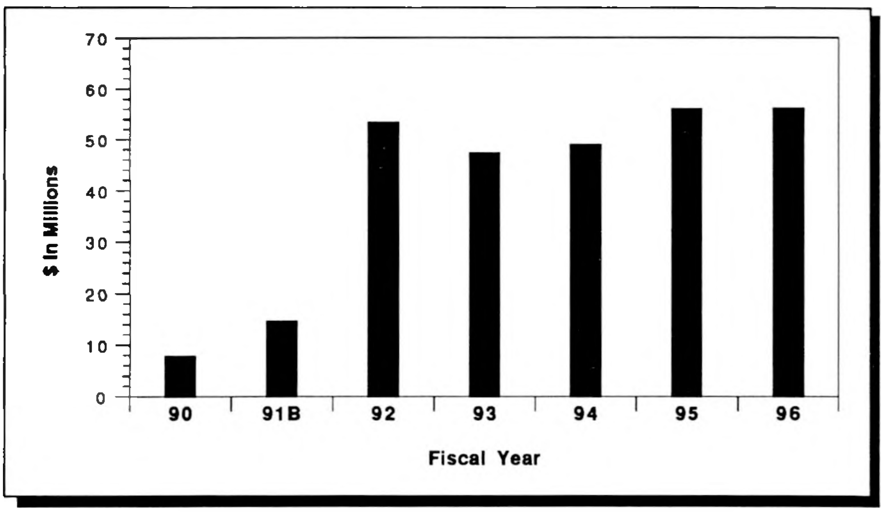


Figure 4.7d.

Growth in waste minimization activities over the planning period represents DOE's commitment to invest for significant long-term payoff.



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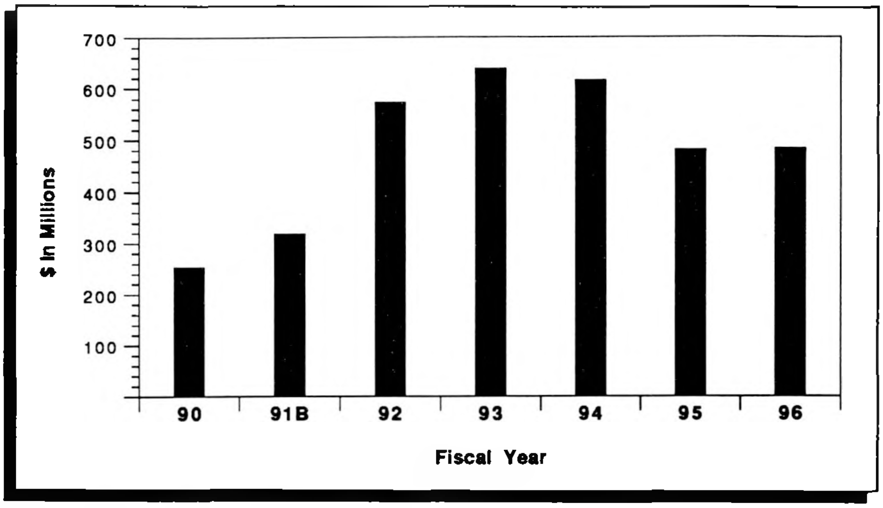


Figure 4.7e.

Continuity of Operations estimated costs rise to a fairly constant level over the planning period.

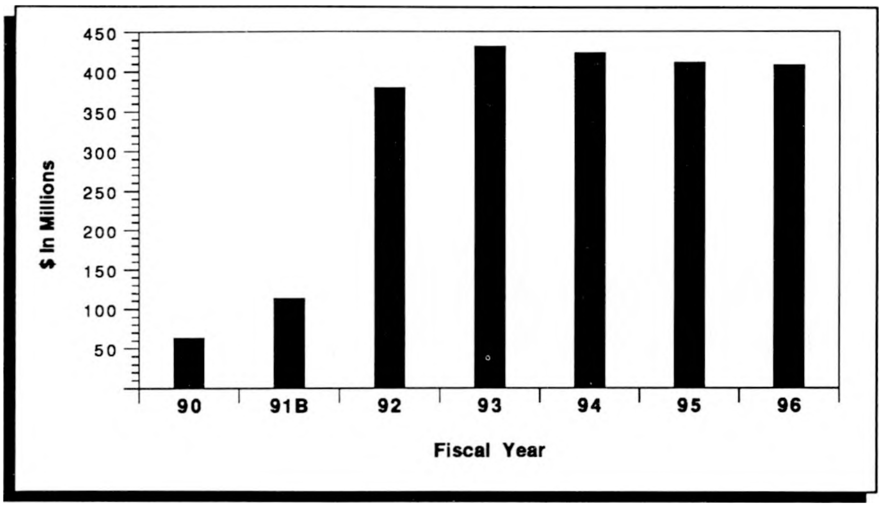


Figure 4.7f.

Estimated costs shown here include DOE's contribution to high-level waste fund, a proposed central DOE mixed waste analytical facility, and Headquarters operating reserve.

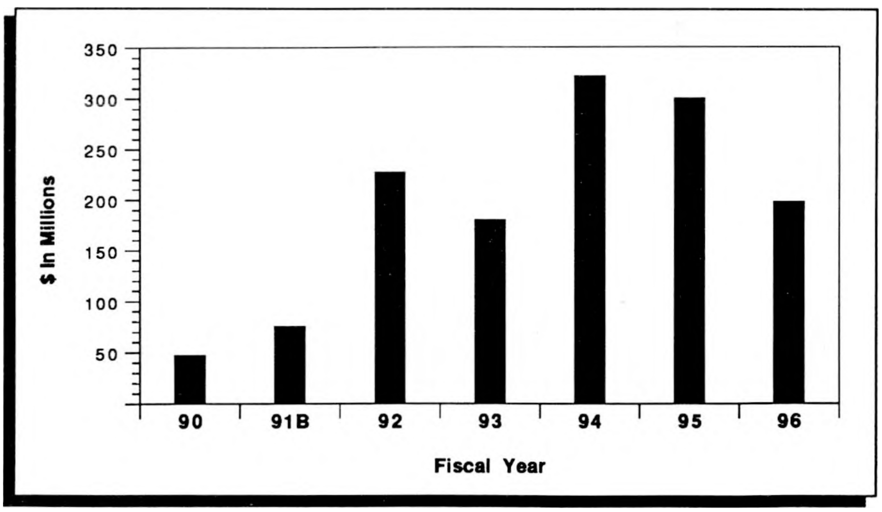


Figure 4.7g.

Waste Management has responsibility for the landlord function at Richland, Idaho, and Oak Ridge Gaseous Diffusion Plant.

5.0

Technology Development

Managing and implementing
the aggressive program described
in the November 1989 Draft RDDT&E Plan;
Education; Transportation.

5.1 OVERVIEW OF THE TECHNOLOGY DEVELOPMENT PROGRAM: MISSION AND STRATEGIES

To fulfill its mission of rapidly providing new technologies to improve Waste Operations and Environmental Restoration operations, the Office of Technology Development (OTD) will (1) establish the means to identify and prioritize needed technology development activities, (2) aggressively use all internal and external resources to find solutions, and (3) rapidly transfer those solutions to DOE and other users.

To successfully achieve its 30-year cleanup goal and to do this with the lowest possible cost, DOE must create and rapidly field new technologies concordant with all applicable regulations. The principal mission of OTD is to provide these new technologies by increasing investment in and improving the management and coordination of DOE's technology development activities. This mission will be accomplished by cooperating closely with the Waste Operations and Environmental Restoration Offices and by using all internal and external resources available. OTD also has the additional responsibility of coordinating many of the Office of Environmental Restoration and Waste Management's (EM) functions that crosscut the individual missions of the different offices. The major goals of OTD and the strategies by which they will be achieved are discussed in this section.

OTD will establish a centrally managed program that will provide timely technical solutions to EM's problems. The basic elements of this program and their relationship to technical support activities within Operations are shown in Figure 1.6. Specific problems or needs for new technologies will be identified by working jointly with the Environmental Restoration and Waste Operations Offices. The needs will be identified using the operational roadmaps discussed in Section 1.7. Needs (including function, system relationship, potential benefit, and timing) from all sites will be consolidated and prioritized by EM Headquarters staff. The strategy for providing timely solutions to the needs will be documented in technology roadmaps for each key technology area, such as waste minimization or waste treatment. These roadmaps will identify existing technology solutions, the development strategy for new solutions, and needs for basic research and will provide the basis for selecting future research and development investments to ensure timely and acceptable solutions.

OTD will use all resources available to effect responsive solutions. OTD will rely on the existing national laboratory system to develop new and improved technologies because of its extensive technical capability, close ties with operating sites, and its role in DOE basic research programs. Through technology transfer, OTD will increasingly emphasize adapting existing solutions from industry, other Federal agencies, international organizations, and universities. To facilitate and accelerate development of innovative solutions, OTD will encourage partnerships between these groups by publishing the scopes of ongoing research, emphasizing the selection of team proposals, and ensuring that direct action is taken by Headquarters staff.

Once a new technology has been developed and proven or has been successfully applied at a site, OTD will make it available to other DOE sites and to outside organizations. The strategy for achieving successful transfer of technologies to other DOE sites and Federal agencies is to promote joint demonstrations of technologies and to hold frequent workshops in key technology areas. For transfer to industry, both domestic and international, OTD will provide information on its research programs as early as possible to interested groups and will develop agreements that provide industry with needed proprietary protection.

Many EM activities and problems cross organizational and site boundaries. Because of its inherent crosscutting nature, OTD has been assigned the responsibility for coordinating and managing many of the activities that affect all parts of EM, as well as other parts of DOE. For example, OTD will establish an integrated educational and outreach program in science and technology. The objective of this program is to increase the talent pool available for site cleanup and waste management and to involve universities in DOE technology development activities. Activities in this program are outlined in Section 5.7. OTD is also responsible for the waste transportation program, enhancement of analytical laboratory capability, and initiation of the development of the operational roadmaps and the related management information system.

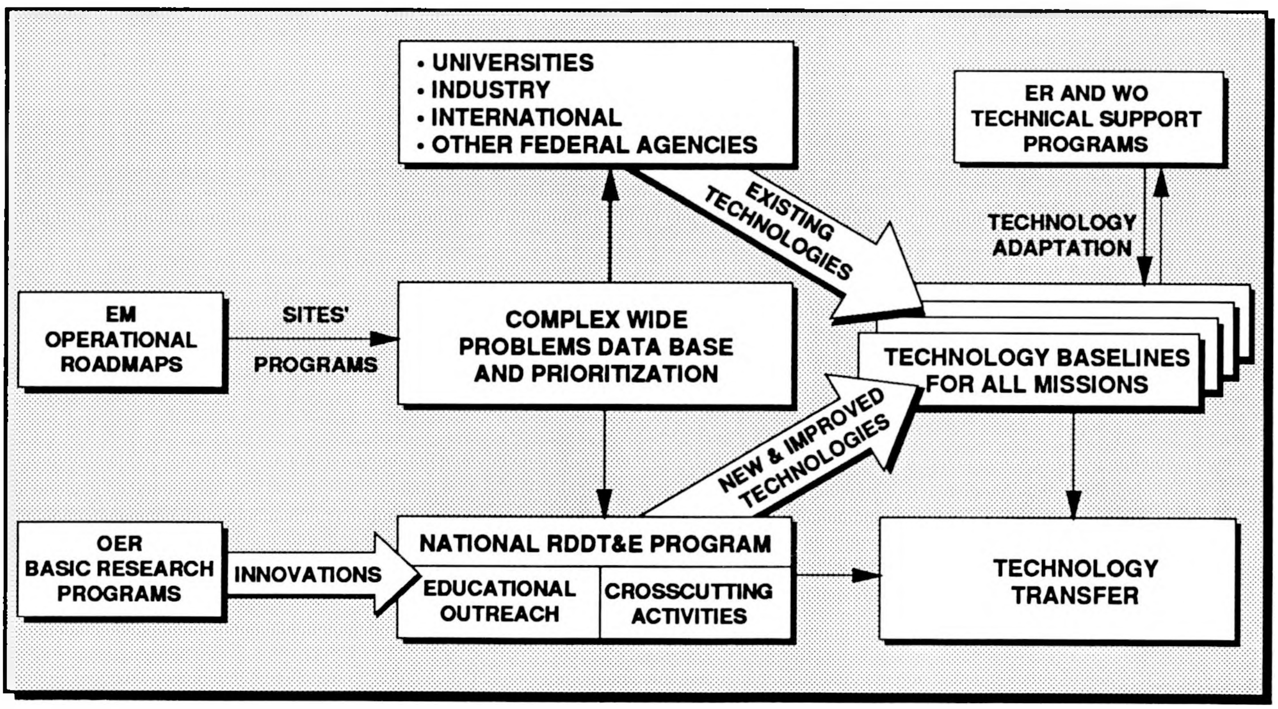
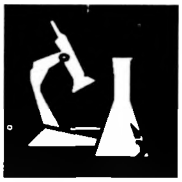


Figure 5.1. The Office of Technology Development identifies and prioritizes technology needs, coordinates internal and external resources to find solutions, and serves as the focal point for technology transfer. (EM = Office of Environmental Restoration and Waste Management, ER = Environmental Restoration, WO = Waste Operations, OER = Office of Energy Research, RDDT&E = Research, Development, Demonstration, Testing, and Evaluation)

5.1.1 GOALS OF TECHNOLOGY DEVELOPMENT



Technology development in the Office of Environmental Restoration and Waste Management (EM) will follow a needs-driven course, with both near-term and long-term goals.

Long-term goals of the Office of Technology Development (OTD) are to

- become the international leader in technology development for environmental restoration and waste operations,
- expand the talent pool for site cleanup and waste management through significant support of education in science and technology, and
- provide effective support to EM in the identification and resolution of technology needs.

Attainment of these goals will reduce waste generation, overall costs, and risks.

To meet these long-term goals, milestones have been established (Section 5.8), and specific near-term goals have been identified in waste minimization technology, site characterization and assessment methods, waste treatment, remediation technology (especially in situ methods), and education.

Waste Minimization goals for waste reduction ranging from 50 to 80 percent have been established for different waste types (Section 5.3.1). Technical approaches include substitution of solvents to reduce or eliminate the use of hazardous chemicals, development of alternative metal-forming processes that consume less stock and yield less waste, and recycling of scrap.

Site Characterization and Assessment technology development goals are to provide nonintrusive characterization methods, remote assay systems, and other innovative monitoring technologies. Programs being supported include geophysical modeling, remote sensing, and detection and on-line, real-time monitoring (Section 5.3.4.1).

Waste Treatment technology development goals are destruction of toxic material, reduction of toxicity, volume reduction, extraction of materials for recycling, and fixation of residues (Section 5.3.2).

Remediation Technology goals are to contain the spread of contaminants from waste disposal sites, provide permanent isolation of contaminants, and remove contamination from soils and groundwater. To avoid the "dig it up and bury it cycle," the greatest emphasis is given to in situ remediation technologies such as vitrification; bioremediation; installation of temporary, nonpolluting barriers; and other alternatives to pump-and-treat and "hog and haul" methods (Section 5.3.4.2).

Education goals are to support the interest of the academic community in environmental restoration and waste operations technologies, stimulate students to pursue environmental management careers, and involve minority, Native American, and disadvantaged persons in environmental programs. To pursue these goals, pilot DOE-university partnership programs have been initiated (Section 5.7.2), scholarship and fellowship programs have been established, and an outreach program for K-12 grades has begun (Section 5.7.1).

As discussed in Section 1.5.1, uncertainty in technology development is related to the fact that technological breakthroughs (or breakthroughs in basic research supported by DOE's Office of Energy Research) cannot be planned or scheduled, although they often provide a significant portion of the return from investment in research and development. Prudent technology development planning cannot rely on breakthroughs but must be based on less spectacular accomplishments.

A critical issue in management of applied technology development activities is maintaining programmatic focus of ongoing work (Sections 5.2.1 and 5.2.2). There is a natural tendency for research to diversify and to move into new areas of exploration, causing a program to become diffuse. To counteract this tendency, it will be necessary to ensure that each activity supported is based on a sound development plan and to continuously monitor progress within the plan. Technical review committees may be requested by OTD to assist in the evaluation of activities and their applicability to environmental restoration and waste operations needs. Activities that fail to progress will not be continued.

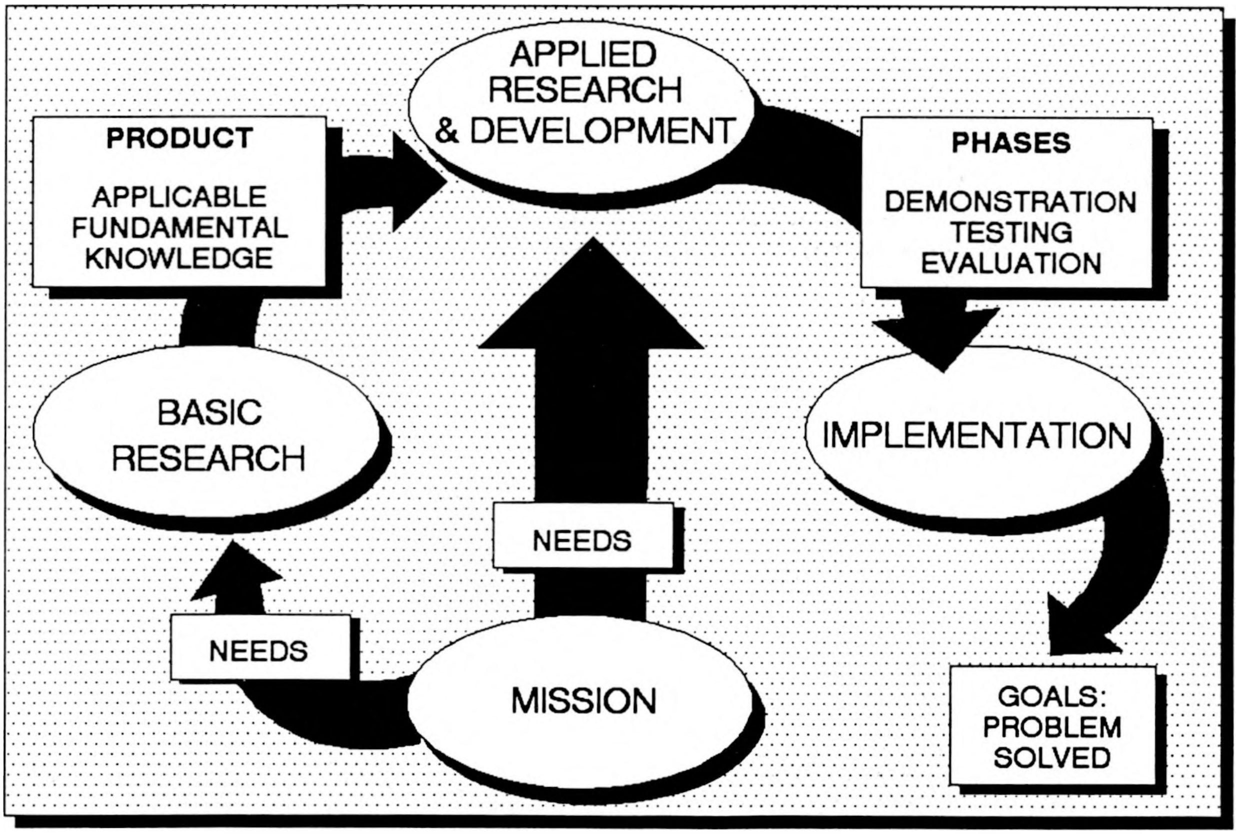


Figure 5.1.1. Mission-generated needs guide the technology development to focused goals.

5.2 DOE APPROACH TO MANAGING TECHNOLOGY DEVELOPMENT

The Office of Technology Development (OTD) will conduct an aggressive national program to nurture and protect applied Research, Development, Demonstration, Testing, and Evaluation (RDDT&E) activities.

Within the Office of Environmental Restoration and Waste Management (EM), OTD will centrally manage an aggressive national program for applied RDDT&E. OTD's charter is to (1) accelerate the development of new technologies to solve environmental restoration and waste operations problems; (2) develop technology to improve environmental restoration and waste management effectiveness, efficiency, and safety; (3) enhance educational programs and initiatives; and (4) encourage collaboration and technology transfer among Federal agencies, State and Tribal governments, industry, academia, and the international community.

<u>Concept of Operations</u>: OTD develops policy, provides oversight, and exercises centralized management of the technology development program, which will be implemented through DOE Operations Offices. Operations Offices draw on the capabilities of industry, national laboratories, DOE contractors, and universities to develop new technology. Program Coordination Offices will assist OTD in the coordination of innovative technology, research and development (R&D), and demonstration, testing, and evaluation (DT&E) projects among Operation Offices. OTD uses technical committees and working groups, as appropriate, for advice on technical and programmatic matters such as the development of national programs spanning R&D and DT&E, and the timeliness of the movement of projects from applied R&D through evaluation. These technical committees and working groups will also facilitate the transfer of technology within DOE and with other Federal agencies and industry and will monitor technology development activities' responsiveness to environmental research and waste operations needs.

<u>The Office of Technology Development</u>: This Office has four divisions: R&D, DT&E, Educational Program Development, and Program Support. The Transportation Management Program is also a part of OTD. The R&D Division will be responsible for both the R&D and innovative technology programs. The DT&E Division will be responsible for readying technologies for implementation. The divisions will work closely with each other as part of a working group to coordinate the identification and screening of projects that are ready for demonstration. They will also coordinate with EM to identify technology development requirements and to ensure responsiveness to identified needs. The R&D and DT&E Divisions are each organized into two branches--Environmental Restoration and Waste Operations.

The Education Program Development Division, organized into Technology Integration and Education Curriculum Branches, is responsible for stimulating the education of technical personnel for EM tasks and for integrating resources from industry, universities, and other Federal agencies. Specifically, technology integration will include efforts that reflect not only traditional technology transfer out of the DOE complex but also organized activities for transfer of technologies residing in the private sector into the DOE system.

The Transportation Management Program provides transportation support to all DOE elements (including EM) and is organized into four functional areas: operations, R&D, outreach, and emergency preparedness. A detailed discussion of the Transportation Management Program is contained in Section 6.

The Program Support Division provides management, financial, and internal program support to OTD and is also responsible for crosscutting areas such as international technologies.

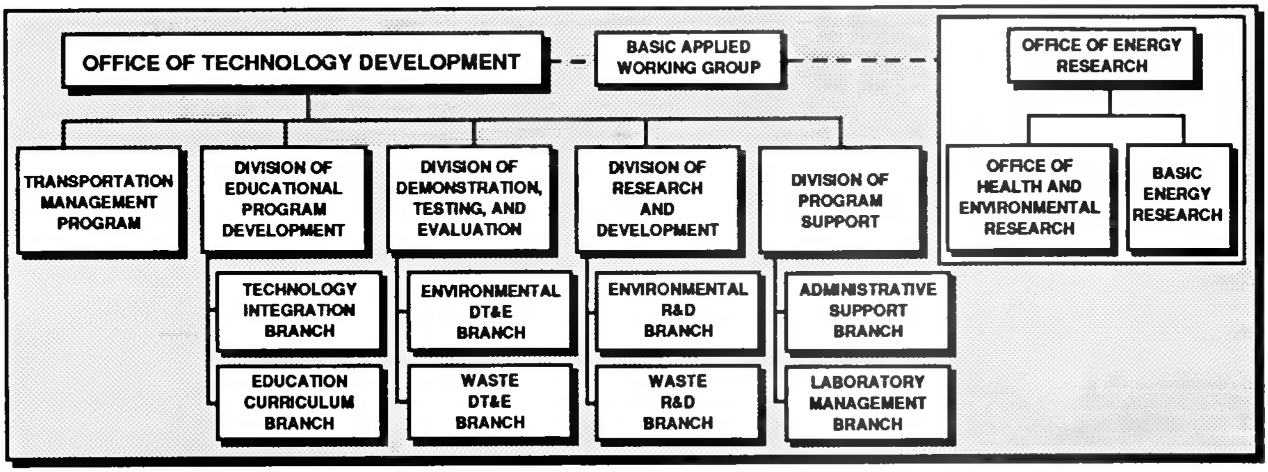


Figure 5.2. The Office of Technology Development has been established to meet the Department of Energy needs in Environmental Restoration and Waste Operations. (R&D = research and development, DT&E = demonstration, testing, and evaluation)

5.2.1 MANAGEMENT SUPPORT FOR TECHNOLOGY DEVELOPMENT

The Office of Technology Development (OTD) will use an extensive support structure to mobilize strong participation by industry, academia, and DOE national laboratories and contractors.

Management of technology development requires a broad set of organizational ties with other DOE units including field offices, Program Coordination Offices, technical committees, and working groups.

Operations Offices: DOE Operations Offices will exercise day-to-day management of research, development, demonstration, testing, and evaluation (RDDT&E) activities. Each Operations Office has appointed a Technical Program Officer (TPO) to serve as the primary contact between the Operations Office and OTD. The TPO is responsible for the administrative coordination and implementation of the technology development program. The TPO will work closely with Program Coordination Offices in coordinating and integrating innovative technology, research and development (R&D) and demonstration, testing, and evaluation (DT&E) projects among Operations Offices. The TPO will also work with the end-user to ensure OTD-sponsored projects are responsive to actual technology needs.

Each national laboratory or major DOE support contractor performing RDDT&E work for Operations Offices has appointed a Technical Program Manager (TPM) to be the principal contractor contact and to coordinate the RDDT&E activities performed by that national laboratory or contractor. The TPM reports to the TPO for programmatic direction and guidance.

Program Coordination Offices: Program Coordination Offices are being established for the Innovative Technology, Applied R&D, and DT&E programs at the Idaho Operations Office, Chicago Operations Office, and Oak Ridge Operations Offices, respectively. The Program Coordination Offices for Innovative Technology and Applied R&D will report to the R&D Division, and the Program Coordination Office for DT&E will report to the DT&E Division.

At the request of OTD, Program Coordination Offices may assist OTD in needs determinations, Activity Data Sheet and Field Work Proposal review, prioritization, budget support, review of projects to avoid costly duplication of effort, coordination of multilaboratory accomplishment of a particular project, and other support activities. The Program Coordination Offices work closely with technical review committees to ensure that projects are carried from applied R&D through evaluation in a timely fashion.

Internal and External Coordination: Technical committees and working groups (e.g., Internal and External Technical Review Committees, Risk Management Coordinating Group, Environmental Restoration and Waste Operations Analytical Needs Task Force), along with OTD staff, will provide coordination within DOE (e.g., the Office of Defense Programs). External coordination will be provided by a close working relationship between OTD and committees and groups established to facilitate non-DOE communications and interface. For example, OTD will coordinate and work closely with the Superfund Innovative Technology Evaluation Program, the Interagency Working Group for Hazardous Waste Technologies, State and Tribal Government Working Group, and other similar organizations. DOE is examining the possibility that tax incentives may be used to promote private industry involvement in technology development.

Technical review committees, composed of panels of impartial highly qualified scientists and engineers, are convened on an ad hoc basis to provide technical review and make recommendations to OTD on the transition of projects from R&D to DT&E. The Basic/Applied Research Working Group has been formed to assist in identifying some research needs and to facilitate the transfer of fundamental information into applied research.

Coordination with Office of Energy Research: The Headquarters basic research liaison in the Division of Research and Development will provide guidance to Office of Energy Research on fundamental research needs and will, in addition, provide conceptual information to technology programs. Coordination with Office of Energy Research will include an annual review of basic research projects that are relevant to RDDT&E and preparation of a management plan that covers (1) expected time for implementation of technologies; (2) anticipated reductions in risk, health effects, and cost; and (3) links to near-term mission needs being addressed.

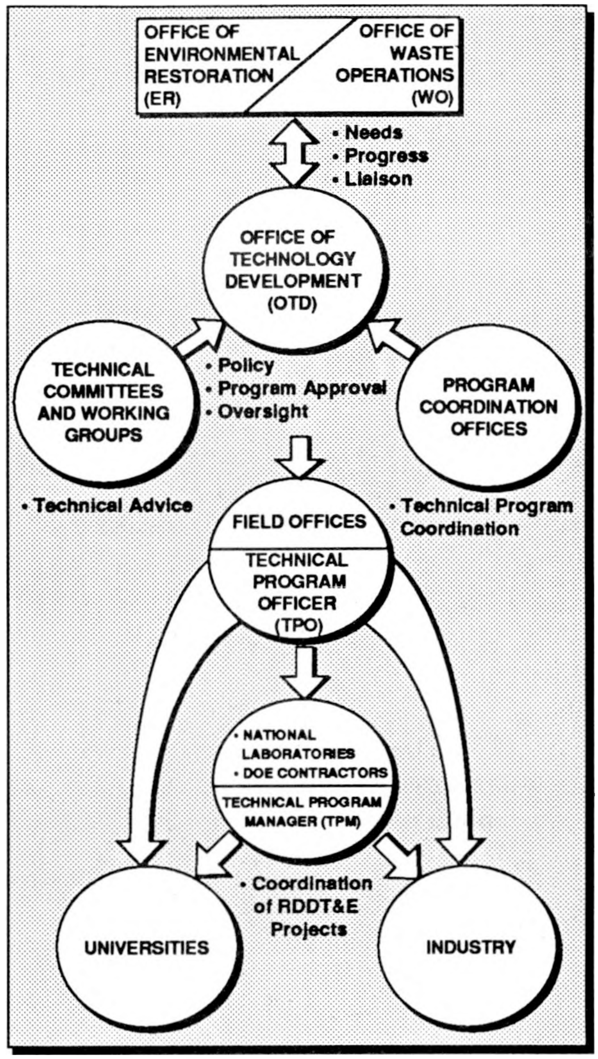


Figure 5.2.1. Effective, centralized management of technology development by the Office of Technology Development requires regular liaison with Environmental Restoration and Waste Operations to establish technology needs and ensure responsiveness. It also requires teamwork and support from Operations Offices, working groups, committees, industry, and academia. (RDDT&E = research, development, demonstration, testing, and evaluation)

5.2.2 IMPLEMENTING THE TECHNOLOGY DEVELOPMENT PROGRAM

Selecting and moving projects from research and development (R&D) through final evaluation will require teamwork among many DOE and external organizations and working groups.

Implementation of a successful and responsive technology development program will require teamwork and coordination among the Offices of Technology Development (OTD), Environmental Restoration, Waste Operations, and other organizations, committees, and working groups inside and outside DOE.

Details on the processes, organizations, and interrelationships/interfaces involved in the implementation of the technology development program will be contained in an OTD management and implementation plan.

Selecting and Developing Projects for Application: The preparation of a technology program that is responsive to Environmental Restoration and Waste Operations needs requires close coordination and cooperation between OTD and the Environmental Restoration and Waste Operations Offices. To facilitate this coordination, OTD will assign individuals to serve as liaisons to these offices. As part of the process for defining OTD's Program, these individuals, along with Environmental Restoration and Waste Operations representatives and other OTD staff, will screen Activity Data Sheets representing potential technology development projects to identify potential duplications and to determine if the projects address actual needs. Potential projects will then be prioritized according to the process described in Section 5.6 and approved by the Office of Environmental Restoration and Waste Management (EM) Associate Directors.

Approved and funded research, development, demonstration, testing, and evaluation (RDDT&E) projects will be moved from the applied R&D phase through the demonstration, testing, and evaluation (DT&E) phases in a timely fashion. The transition of technologies into more advanced phases of development requires the establishment of technical and regulatory criteria (i.e., filters) for ascertaining if and when a project should be advanced. Because development costs increase dramatically as a project progresses to more advanced phases, funds will probably not be available to support full development of all concepts. Thus, using technical and cost-related reasons, the number of projects moving between phases will be selectively decreased by a filtering process.

Movement of Projects Between Development Phases: OTD will perform this filtering process (Figure 5.2.2a). The transitions between phases will not have clear demarcations. To facilitate the filtering and transitioning process, OTD will develop a clearly defined methodology and use readiness review teams consisting of representatives from the R&D and DT&E Divisions, Environmental Restoration and Waste Operations Offices, and the user community to periodically review projects. Technical review committees may be requested by OTD to advise on the continued validity of the technological approaches to meeting Environmental

Restoration and Waste Operations needs. In addition, decisions on the transition of projects through successive development phases will consider information derived from other sources as well, including interagency coordinating groups.

A Life-Cycle/Team Approach to RDDT&E Management: The Technology Development Program will not be performed in a vacuum; it will be performed in conjunction with the Environmental Restoration and Waste Operations Offices and with user organizations and will call upon basic research results from the Office of Energy Research as they emerge. As depicted in Figure 5.2.2b, OTD involvement is greatest in the early phases of the development life cycle, while the technical contribution of Environmental Restoration and Waste Operations will increase as projects move toward application. Successful implementation of the Technology Development Program will require cooperation and teamwork among all EM offices, other DOE and non-DOE organizations, and end-users during all development phases. Furthermore, to help ensure success, OTD projects will clearly address quality assurance, safety, environmental permits, regulatory compliance, engineering standards, training, and preparation of procedures for end-users.

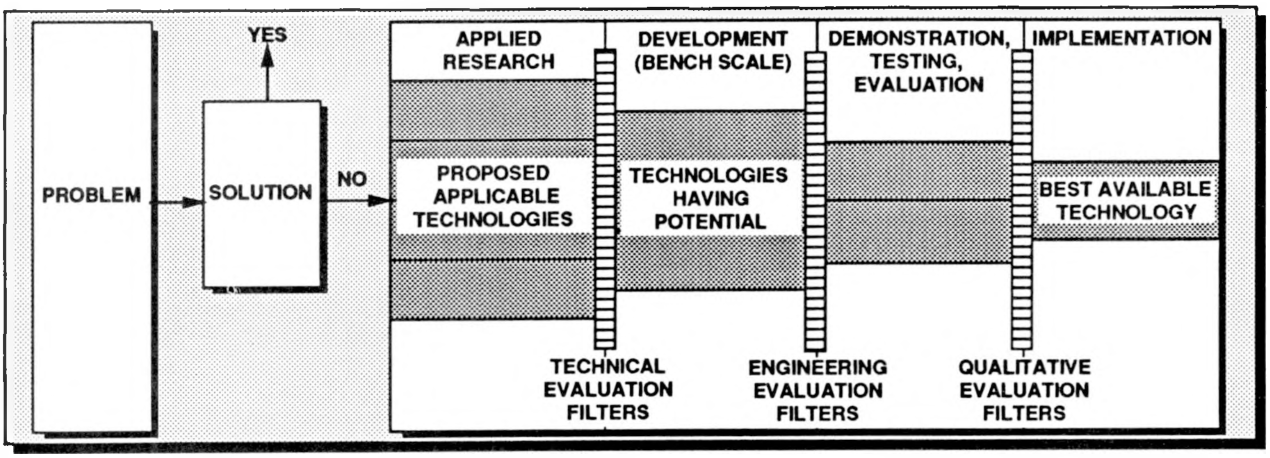


Figure 5.2.2a. Research, development, demonstration, testing, and evaluation projects will be assessed by technology and regulatory filters as they progress to more advanced (and more costly) stages of development to ensure that only the most useful technologies emerge for implementation.

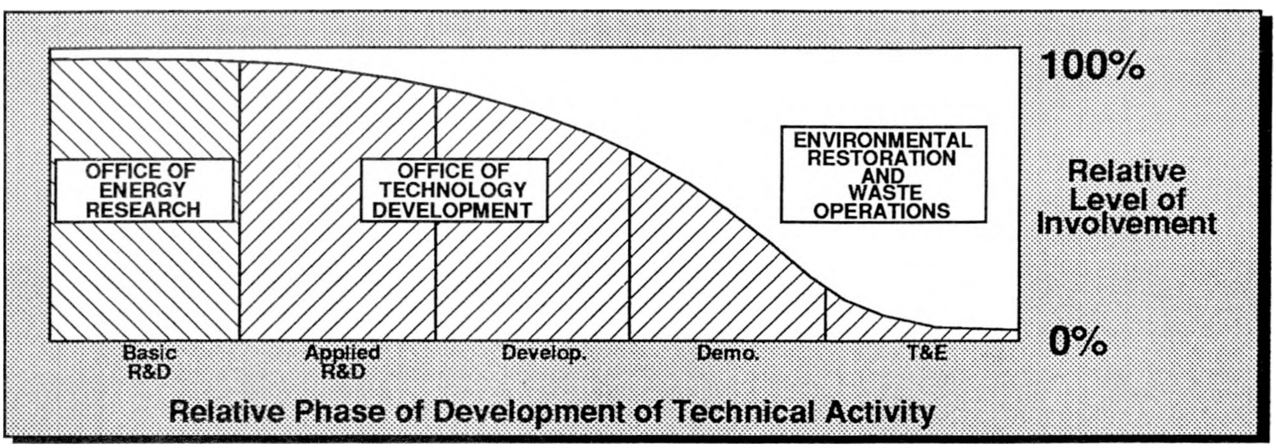


Figure 5.2.2b. Active involvement and participation by Environmental Restoration and Waste Operations staffs will increase as technology development projects move from basic research to evaluation for final application. (R&D = research and development, T&E = testing and evaluation, OTD = Office of Technology Development, OER = Office of Energy Research)

5.3 OVERVIEW OF TECHNOLOGY NEEDS

Improved technology is needed in three areas: (1) waste minimization to reduce the size of future problems, (2) waste operations to prevent the need for future site cleanup, and (3) environmental restoration to fix past mistakes to meet DOE's 30-year goal.

Multidisciplinary waste minimization, waste operations, and environmental restoration technologies are DOE's tools to correct present problems. Research and development (Figure 5.3) are needed to (1) minimize production of new waste by using fewer hazardous materials and recycling; (2) create waste forms suitable for disposal; (3) permanently dispose of waste; (4) characterize and remediate contaminated sites and restore environmental quality; and (5) characterize, decontaminate, and decommission contaminated facilities.

Demonstrations are needed to prove concepts developed under DOE sponsorship and to adapt commercially available technologies to unique DOE problems, such as mixed waste. Testing and evaluation assess the appropriateness of recommended technologies. Close ties with DOE's operating sites are essential. Demonstrations of selected technologies at the various sites provide the opportunity to identify limits and benefits in the technologies caused by difficulties in missions, processes, regulations, climate, geology, and demographics.

Waste minimization is a legal requirement, an ethical responsibility, and often has a financial benefit. Minimization technology restricts use of hazardous materials, recycles materials, and reduces consumption of materials. Waste minimization will be coordinated with DOE's modernization program and other related programs.

Huge volumes of waste are in storage awaiting treatment and/or disposal. Waste operation needs the technology to characterize, classify, and segregate waste into nonradioactive, hazardous, and radioactive fractions that can be sent directly to disposal or can be converted to acceptable disposal forms. Similarly, wastes exhumed during environmental restoration and secondary waste streams generated by environmental restoration and decontamination and decommissioning activities require treatment and conversion to disposable products. Failure to properly deal with DOE waste generation will result in failure to meet regulatory requirements and unacceptable cost.

Environmental restoration needs include site characterization and assessment. If permanent remedial methods are not available, or if contamination is spreading, interim containment may be required. Remediation includes treatment of contaminated soils, sludges, ponds, and groundwater to destroy or permanently confine radioactive and hazardous chemicals.

Better and earlier communication with the field can provide DOE with more accurate information. Movement of nuclear and hazardous materials from site to site affects the waste management problem of each site. Existing information systems cannot describe the path from waste generation to disposal. Advanced data management and waste tracking systems are needed to determine where, why, and how wastes are generated within a production process spanning several DOE sites.

To support the three major areas, analytical chemistry techniques are required to accurately measure contaminants at very low concentrations. Knowledge about the effect of low concentrations of hazardous materials on human health and the environment is incomplete. Research is needed to define levels that are below regulatory concern, although DOE plans no activity in this area. This information would define "how clean is clean" and will guide the implementation of waste management and environmental restoration actions.

Site characterization, sampling methods, and performance assessment methods should be standardized, validated, and linked to ensure that valid data are acquired. Standardized methods for characterizing and qualifying waste materials for disposal in designated locations will support procedural activities and not conflict with regulatory intent. Current risk management programs cannot address the array of problems facing DOE: worker and public safety, adverse environmental impacts, and disruption of DOE production and research activities.

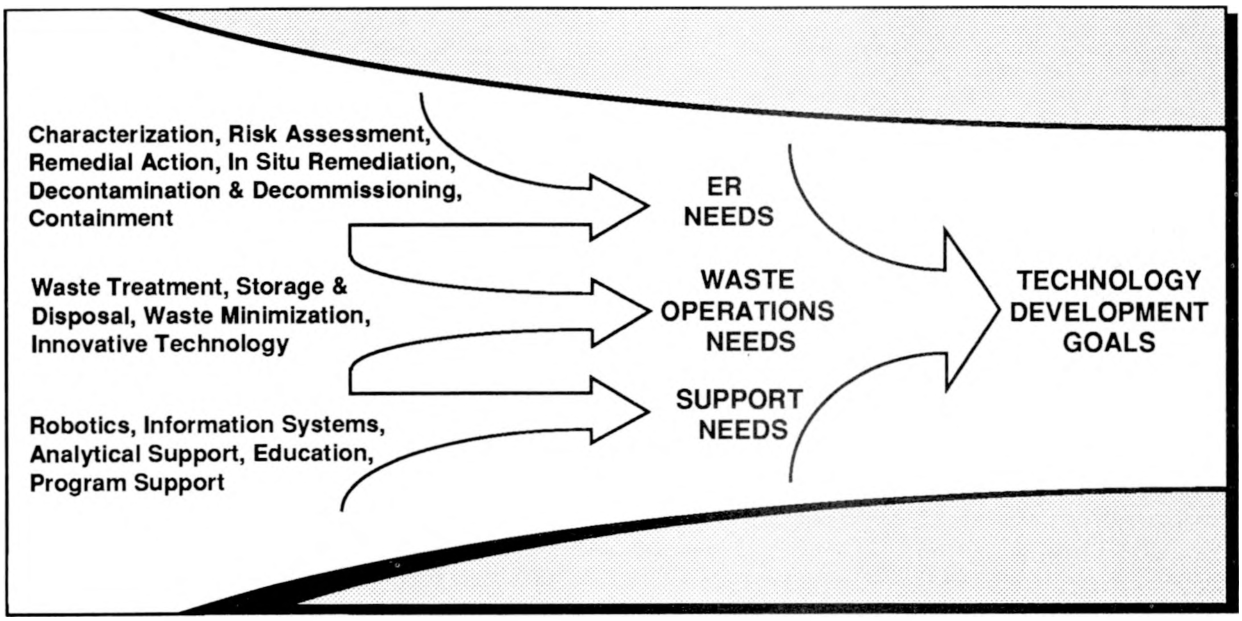


Figure 5.3. Technologies are being developed in broad groupings that feed three major areas of emphasis, leading to the meeting of technology development goals. (ER = Environmental Restoration)

5.3.1 TECHNOLOGY NEEDS FOR WASTE MINIMIZATION IN MANUFACTURING

The goal of waste minimization (WMIN) Research, Development, Demonstration, Testing, and Evaluation (RDDT&E) projects is to achieve a 50 to 80 percent reduction in manufacturing waste generation (FY 1985 baseline) within 10 years of program initiation by material substitution, process alteration, new production hardware, and recycling.

WMIN is the reduction of radioactive, hazardous, and mixed waste as it is generated before treatment, storage, and disposal (Figure 5.3.1). It is a legal requirement and often yields a financial benefit. DOE manufacturing facilities generate thousands of cubic feet of nuclear and nonnuclear wastes each year. For example, about 15 percent of the Oak Ridge Y-12 Plant's operating budget is spent on waste management, and this percentage is probably typical for DOE production facilities.

Major changes will be necessary within manufacturing operations, nuclear materials production and processing, and research and development (R&D) activities of the nuclear weapons complex to achieve significant benefits from WMIN. The Office of Technology Assessment stated in a 1986 report (Serious Reduction in Hazardous Waste) that administrative changes and capital improvements could produce about a 50 percent reduction in the volume of hazardous waste resulting from commercial manufacturing.

With new manufacturing technology for weapons production, the RDDT&E WMIN Team's estimates of 50 to 80 percent reductions have been established as RDDT&E goals for WMIN. (See the following table.) Note that these are systemwide goals and may vary by facility and with programmatic changes. A comprehensive WMIN program will contribute to decreases in waste treatment, storage, and disposal cost and lower health risks to workers and the public.

RDDT&E WMIN Goals For Weapons Manufacturing

Waste type	Reduction goal*(%)
Sanitary	50
Transuranic	60
Hazardous	80
Low-level	80
Mixed	80

*Based on FY 1985 manufacturing waste generation rates using volume or weight as appropriate.

Technical approaches are being sought to (1) optimize the number of production operations required; (2) increase the use of nonhazardous chemicals and chemicals that produce waste compatible with the environment; (3) increase the use of recyclable chemicals and materials; and (4) implement the design of new or redesign of existing products, processes, and facilities. Some criteria to determine a successful technology include improved processing yield, reduced quantities of scrap, reduced waste and processing of by-products, reduced use of hazardous chemicals, positive return on investment, and no loss of product quality.

Traditional plant and process designs usually did not consider the volume or characteristics of waste generated. This was partly due to the low cost of feed material and waste disposal. Frequently, waste disposal was not charged to the operating organization. An initiative might be to levy a charge on generators for poor efforts to reduce waste generated.

Although these WMIN manufacturing goals do not apply to decontamination and Environmental Restoration, WMIN needs to be factored into the planning of these activities. Nonetheless, total reportable quantities of waste generated may temporarily increase as sites achieve regulatory compliance. WMIN in manufacturing benefits Environmental Restoration by decreasing the demand for waste treatment and storage.

Work has begun during FY 1990 in alternate cleaning processes (liquid CO_2, dry process for surfaces, fluxless soldering); material substitution (chlorinated hydrocarbon and fluorocarbon solvents, cutting oil, bagging material); process improvements (near-net-shape metal forming, on-line process control, plutonium alloy processing without mercury, depleted uranium manufacturing waste minimization); and recycling (tritium recapture, depleted uranium).

Depleted uranium manufacturing optimization is the largest funded activity and has multiple applications in WMIN. It will demonstrate methods to reduce waste from metal processing by minimizing stock usage; recycling scrap; improving fabrication, recasting and reforming; and preventing mixed waste by separating radioactive and nonradioactive wastes. WMIN techniques from this program have application in processes using enriched uranium and plutonium.

Future Activity: New programs will demonstrate minimization methods for plutonium, enriched uranium, other metal processing; tritium, and secondary processes that generate large amounts of wastewater and spent chemicals. Other projects (in collaboration with DOE Defense Programs) include reducing manufacturing waste by making WMIN part of the design process for future weapons.

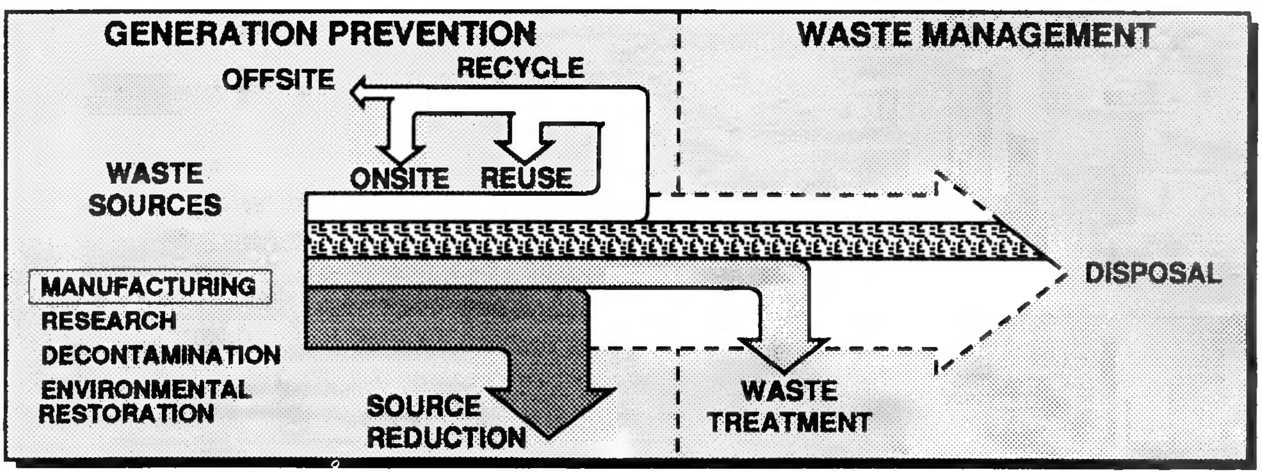


Figure 5.3.1. Waste Minimization in manufacturing will preserve disposal space, increase material usage efficiency, and reduce costs.

5.3.1.1 WASTE MINIMIZATION IN NUCLEAR MATERIALS PROCESSING

Reductions of mixed waste, 60 to 80 percent reductions of radioactive waste, and increased material usage efficiency as a result of technological improvements are 10-year goals.

The technology available for nuclear materials processing defines the production techniques for radioactive materials and materials used for their nuclear properties. To the extent practical, waste minimization should reduce inefficiency as near the beginning of the manufacturing process as possible and should produce waste that is compatible with the environment (Figure 5.3.1.1). This approach reduces the material usage at the beginning of the manufacturing operations and shifts to recycle later in the manufacturing process. Consequently, a smaller facility is needed to perform processing and recovery, which further reduces cost. New technology is still needed, however, to increase nuclear materials processing and recovery efficiency. These new processes and recycling technologies will be defined by information from process waste assessments that characterize the waste sources.

Current Research, Development, Demonstration, Testing, and Evaluation (RDDT&E) Activity: Technology that will provide 60 to 80 percent radioactive waste reduction from nuclear material and weapons manufacture is being identified. An approach for minimizing radioactive waste generation at the source is demonstrated by the ongoing Depleted Uranium Waste Minimization Program. At the Y-12 Plant in Oak Ridge, Tennessee, this comprehensive program includes projects that minimize stock, improve fabrication recasting and reforming, upgrade secondary processes, and improve waste separation methods. This program is expected to reduce the amount of nuclear and hazardous material used and to greatly reduce low-level and mixed wastes from the different processes. The lessons learned from this initial program will have application throughout the DOE complex.

Ongoing plutonium and tritium minimization projects include reductions in the generation mixed wastes as a result of improved waste segregation methods. Such approaches segregate the small radioactive portion of the waste stream from the hazardous portion. Technology to recycle useful materials is being developed. Tritium is being collected before discharge into reportable wastewater streams at the Savannah River Site.

Waste minimization projects in site remediation have not been identified at this time, and the full impact of toxic releases from secondary processes at all DOE plants has not been fully determined. An integrated effort by the design laboratories and manufacturing facilities will evaluate waste minimization projects for future weapons production activities.

Future RDDT&E Activities: Examples of technology needs for waste minimization include chemical conversion improvements within operations that produce other types of nuclear material, net shape forming techniques for metal parts, more efficient metal melting technology, part machining techniques that allow direct scrap recycle, source segregation instruments and equipment, and new purification methods for material recovery and recycle.

Some promising technologies identified in FY 1990 include hydroforming and powder metallurgy for metal blanks, metal spray casting, coordinate measuring for thin-wall blanks, electron beam dissolution and chemical conversion, supported liquid membranes for metal extraction, and nonfluoride chemistry for chemical processing.

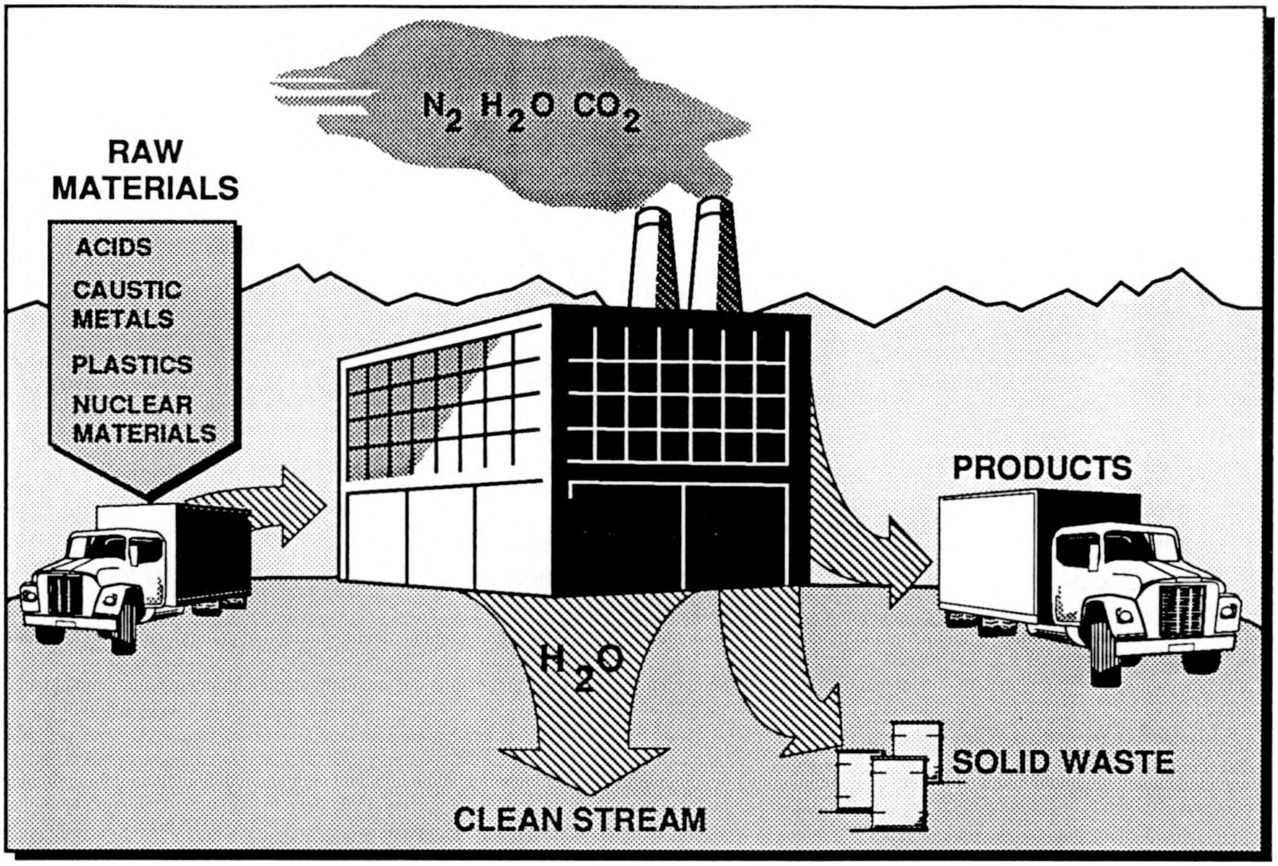


Figure 5.3.1.1. Through changes in manufacturing technology, wastes can be made environmentally benign.

5.3.1.2 WASTE MINIMIZATION IN NONNUCLEAR MATERIALS PROCESSING

New technology will replace hazardous chemicals with nonhazardous substitutes wherever practical and will establish widespread material recycling within 10 years.

Waste Minimization Needs: Thousands of gallons of hazardous solvent waste, heavy metals, and toxic chemicals and thousands of cubic feet of solid waste are generated in DOE facilities annually. Hundreds of hazardous chemicals regulated by the Occupational Health and Safety Administration and used throughout DOE facilities are a potential threat to worker health. Waste minimization is mandatory because of the growing body of environmental regulations such as the Resource Conservation and Recovery Act; the Comprehensive Environmental Response, Compensation, and Liability Act; the National Environmental Policy Act; and the Montreal Protocol.

In the last few years, DOE has significantly reduced the use of hazardous chemicals; however, an expanded effort toward further reductions is necessary. For example, cleaning operations across the DOE complex consumed over 120,000 gallons of chlorinated hydrocarbon solvents in 1988. This represents a 37 percent decrease from 1986. With the easier problems already solved, new technology is needed for nonhazardous materials substitutions, recycling, and nonpolluting processes (Figure 5.3.1.2). The technology ranges from new metal forming and fabrication techniques to advanced chemical processing methods and new nonhazardous chemical substitutes.

Technology development plans include the reduction of heavy metal and toxic chemical usage, the development of nontoxic curing agents for plastics, and the elimination of hazardous organic solvents. Increasing emphasis will be placed on other less hazardous effluents, such as sanitary waste, and technology for pollution prevention from all sources.

Current Research, Development, Demonstration, Testing, and Evaluation (RDDT&E) Activities: The FY 1990 RDDT&E program for nonnuclear materials minimizes the use of hazardous materials. A major project in FY 1990 is focused on hazardous-solvent usage. DOE must identify, demonstrate, and qualify substitutes for these materials, which are used in a wide variety of research and manufacturing applications, such as machining, electronics fabrication, chemical processing, and precision parts assembly. The objectives of the integrated program are the demonstration and qualification of substitute cleaning chemicals or processes that eliminate the need for the solvent and the standardization of solvents where possible.

DOE facilities release millions of gallons of wastewater each day. Significant quantities of hazardous chemicals are used in auxiliary processes such as steam plants and cooling systems, resulting in large amounts of liquid and solid wastes. Most of this water enters streams and must meet clean water regulations. Research and development in wastewater recycling reduces water consumption; recovers scrap material; and eliminates large amounts of common chemicals, such as sulfuric acid, sodium hydroxide, and ion exchange media used to treat the wastewater.

Technology for airborne emissions is needed to achieve compliance with the Clean Air Act and local ordinances. For example, NO_x emissions at the fuel reprocessing plants at Hanford and at Idaho National Engineering Laboratory must be reduced.

Future Activities: The following approaches for nonnuclear waste minimization have been identified:

- use of aqueous solvents/cleaners,
- more benign hydrocarbon solvents,
- waste minimization by design changes,
- improved in-line sensors for process optimization,
- reuse of steam condensates that result in minimizing waste releases,
- new heat exchanger fluids, and
- new cooling tower designs that discharge no liquid wastes.

A coordinated design and production program is planned with support from the Environmental Protection Agency, other Federal agencies, universities, and private industry for the selection of alternate materials that generate minimum amounts of waste and pollutants.

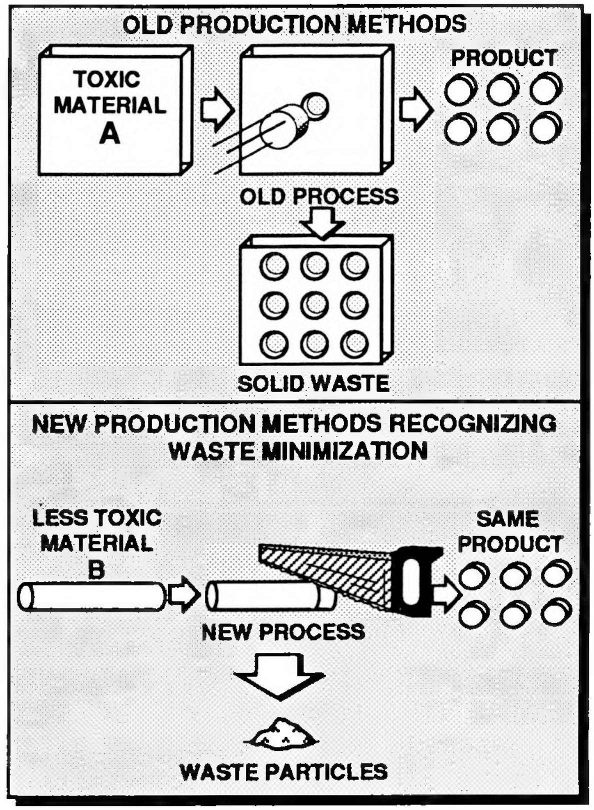


Figure 5.3.1.2. New designs and manufacturing processes result in efficient material usage and reduced waste.

5.3.2 TECHNOLOGY NEEDS FOR WASTE TREATMENT

Without new treatment technologies to reduce volumes and destroy or immobilize contaminants to meet environmental regulations, DOE will spend huge amounts of money but still risk facility shutdowns.

High-level, transuranic, low-level, hazardous, mixed, and sanitary/infectious wastes must all be dealt with as part of waste operations technology needs. Failure to do so will result in not meeting regulatory requirements and in unacceptable costs. Waste operations require technology to segregate nonradioactive, hazardous, and radioactive wastes that can be sent directly for disposal or be converted to acceptable forms. Similarly, wastes exhumed during environmental restoration activities or generated by waste characterization activities require treatment and destruction or conversion to disposable products. Costs for current methods (storage and minimal treatment) are unacceptably high; in many cases these methods are no longer allowed. Recently imposed regulations such as the Environmental Protection Agency's (EPA's) Land Disposal Restrictions (40 CFR 268) require technology to produce acceptable waste materials that meet stringent disposal criteria with a minimum of secondary waste needing treatment and disposal. DOE is entering into regulatory agreements (such as the Tri-Party Hanford Federal Facility Agreement and Consent Order) that commit to cleanups requiring technology development.

Several classes of needs drive waste treatment technology: destruction of wastes where possible and reduction of waste volume; reduction of mobility of toxic contaminants (e.g., solidification); reduction of risk associated with treatment failure; reduction of risk associated with exposure (e.g., protection of workers, etc.); and reduction of costs. Waste treatment involves destruction, reuse, or processing to develop a waste form suitable for storage and disposal. A success story concerning waste treatment is the use of sodium hypochlorite, a waste stream at the Oak Ridge Y-12 Plant in Tennessee, by the Knoxville, Tennessee, sewage treatment plant as a disinfectant. This resulted in substantial cost savings to both DOE and the city.

Improvements in waste operations technologies required to solve DOE's needs fall into four basic categories: separation/concentration, chemical/electrochemical/thermal, mechanical/physical, and biotechnological. Figure 5.3.2 illustrates these waste types and indicates when the technologies may be used.

Some new, potentially cheaper waste treatment technologies are being pursued. These processes are designed to destroy or immobilize toxic components and to reduce by 20 to 75 percent the volume of waste that must be disposed of or stored. Each project supports the unique needs of specific problem streams. If applicable, the technologies are then generalized for DOE-wide application.

Destruction of toxic constituents is the goal of three projects. Research and development (R&D) on supercritical water oxidation is being redesigned to destroy low concentrations of organics in groundwater. Staff working on the Biological Destruction of Nitrates and Organics Project have completed batch and flow-through R&D, and the project is moving to the field. Treatment of reactive metals will convert reactive metals into a glass residue in a demonstration to be conducted this year.

Two projects involve immobilization of waste forms. Operation of the Plasma Arc Furnace pilot-scale facility in Butte, Montana, is a cooperative program with EPA. The system is undergoing shakedown testing and will vitrify soils contaminated with organics, heavy metals, and radionuclides in a field demonstration. EPA is interested in using this technology for contaminated soils treatment. Encapsulation of waste nitrate salts using polyethylene is through pilot-scale testing at a vendor site, and equipment is being purchased for installation at Rocky Flats in Colorado. Demonstration on actual radioactive nitrate salts will be completed in FY 1990.

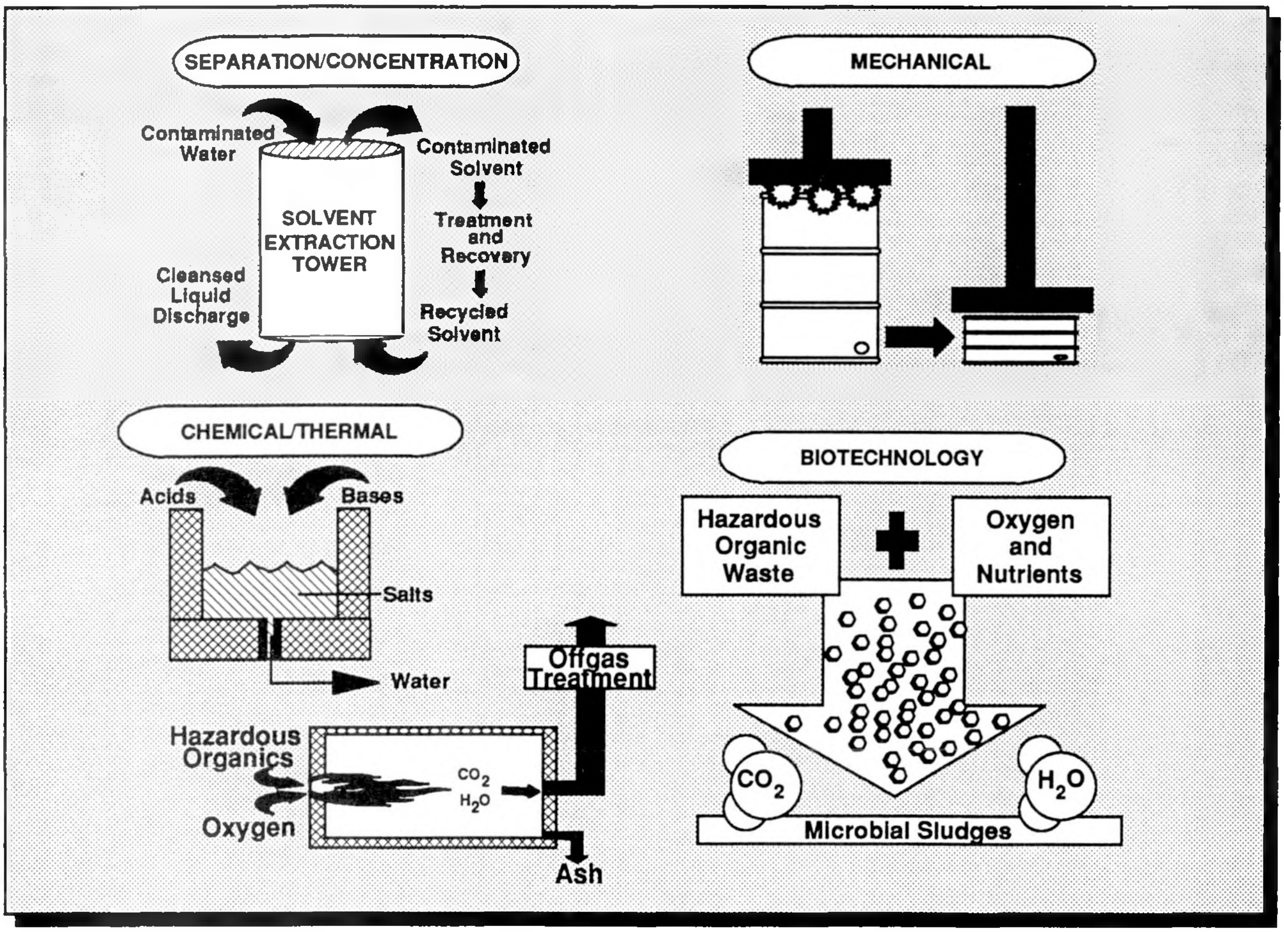


Figure 5.3.2. Examples of waste treatment technologies are (1) **Separation/Concentration** - solvent extraction, which uses organic solvents to remove radioactive and toxic metals from water-based streams; (2) **Mechanical** - supercompaction of drums to reduce waste volumes; (3) **Chemical/Thermal** - acidic neutralization and incineration methods; and (4) **Biotechnology** - destruction of dilute hazardous components in waste streams.

5.3.3 TECHNOLOGY NEEDS FOR WASTE STORAGE AND DISPOSAL

Waste storage and disposal need to be carried out using technologies that avoid the requirement for future environmental restoration programs.

Waste storage and disposal require advanced technologies to ensure continued compliance with evolving DOE Orders and Environmental Protection Agency (EPA) regulations and to ensure protection of the public and the environment without requiring massive environmental restoration.

Storage and disposal technologies fall into three principal areas: (1) improved waste disposal systems, (2) data and tools to predict performance of waste disposal units, and (3) systems for monitoring and conducting surveillance of wastes that are in storage or that have been disposed of.

<u>Improved Waste Disposal Systems</u>: It is recognized that, at many of the DOE disposal sites, geological, hydrological, and ecological conditions do not provide adequate isolation and prevention of radionuclide/chemical migration. The use of engineered structures that consist of natural and man-made barriers has been an area of extensive research and development. The applicability of these barriers, singly or in multiples, must be demonstrated, tested, and evaluated for implementation at specific sites. Long-term performance of barrier materials, especially synthetic materials, is a major uncertainty, and the means for accelerated testing are necessary to enable the durability to be shown with sufficient confidence to obtain regulatory and public approval.

<u>Data and Tools to Predict Performance of Disposal Units</u>: Sufficient experimental data to validate performance assessment models (for accurately predicting the transport of radionuclides from disposal facilities) are not available. Source term data, physical and chemical behaviors of chemical species in soil, effects of engineered barriers, far-field transport of radionuclides, and other pertinent parameters are required for the validation of performance assessments.

<u>Monitoring and Surveillance</u>: Remote monitoring and inspection capabilities for storage and disposal areas are needed. Monitoring technologies need to (1) be less expensive, (2) be less invasive, (3) provide ample evidence that containment of hazardous materials has not been compromised, and (4) indicate problems at a sufficiently early stage so that corrective actions can be relatively easily implemented. Innovative techniques are required for in situ monitoring of low concentrations of radionuclides at new or currently used burial sites, particularly for alpha- and low-energy beta-emitting radionuclides.

Identified storage needs include:

- minimum requirements for the design and operation of low-level waste and transuranic waste storage facilities;
- remote monitoring and inspection capabilities for storage areas to meet

storage requirements (i.e., Resource Conservation and Recovery Act); and
- evaluations to ensure that the integrity of waste containers is compatible with the contained waste for the storage time period.

Identified disposal needs include:
- disposal concepts/technologies for waste requiring long-term isolation;
- improved performance assessment processes and techniques;
- design, development, and demonstration of a mixed-waste disposal facility;
- demonstration of closure of a waste disposal unit (e.g., low-level waste burial ground);
- alternative technology for transuranic waste that is not certifiable for the Waste Isolation Pilot Plant;
- improved monitoring and surveillance of active and inactive waste disposal sites;
- improved stabilization for active and inactive sites; and
- improved waste emplacement technologies.

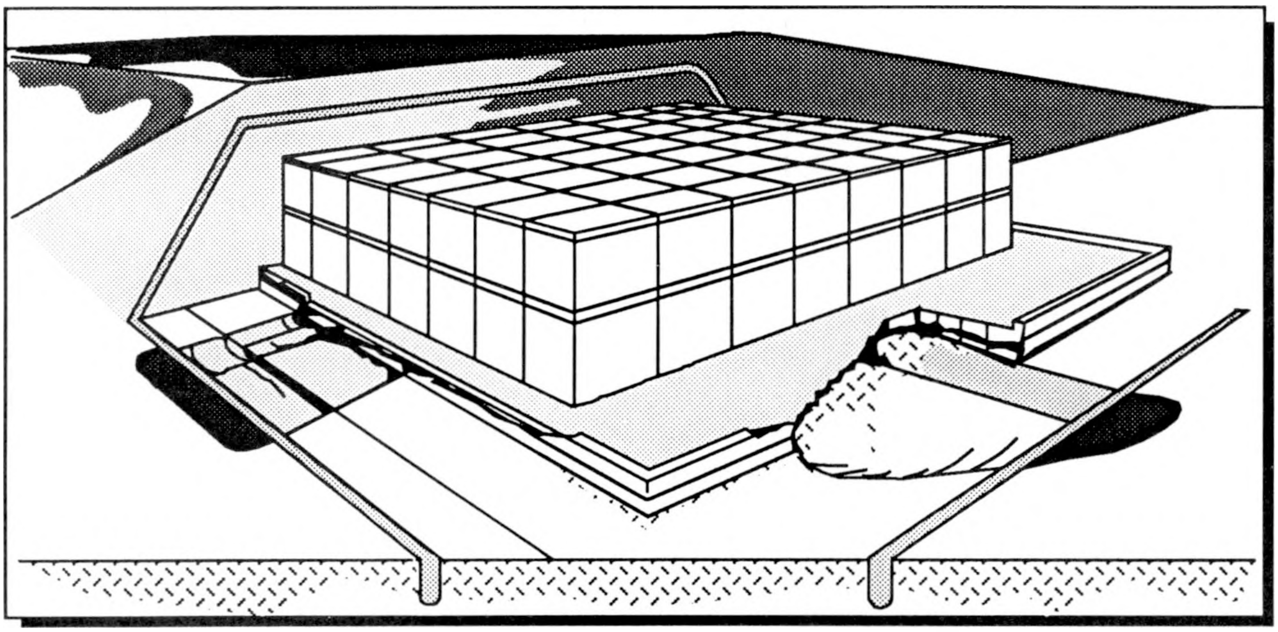


Figure 5.3.3. Tumulus disposal provides for improved long-term isolation and fixation of wastes.

5.3.4 TECHNOLOGY NEEDS FOR ENVIRONMENTAL RESTORATION

If DOE is to meet its 30-year cleanup goal in a cost-effective manner, safer and more efficient technologies for site characterization, soil/groundwater remediation, and facility decontamination and decommissioning (D&D) need to be developed.

Technologies need to be developed that will (1) constitute a permanent restoration solution, (2) minimize wastes as well as health and safety risks during restoration, and (3) prepare restored sites for subsequent use and development.

Present environmental restoration technologies are inadequate and involve high costs because of (1) the inability to accurately assess or characterize the site health/environmental status and cleanup requirements; (2) the absence of safe, efficient, and cost-effective remediating technologies for the diverse assortment of contaminated sites (soils, underground storage tanks, waste lagoons, equipment, and buildings containing a wide variety and levels of contaminants); and (3) the lack of quantitative cleanup goals for remedial action efforts.

New, quicker, and more effective methods for identifying and characterizing the extent of groundwater and soil contamination are needed. Also needed are faster, less expensive, and less intrusive methods for characterizing subsurface geohydrologic features. Present methods rely almost entirely on coring technologies and the drilling and nonautomated surveillance of coreholes and monitoring wells, which are expensive, labor-intensive, and time-consuming, and which are likely to result in conduits for the migration of contaminants to uncontaminated subsurface regions. Strategies for soil and groundwater sampling should conform to prevailing State and Federal regulations as well as rely upon geostatistical design techniques that take into account the existing knowledge of the site. Practical subsurface environment transport models need to be developed and tested to improve field-scale predictive capabilities. Remote and real-time characterization technologies need to be developed for accurately sampling and evaluating the quantities and types of contaminants (radionuclides, heavy metals, and toxic organic compounds) contained in underground storage tanks and waste lagoons. The combination of improved sensors and robotic capabilities can provide a significantly enhanced and powerful tool. Similar technologies are necessary for determining the types and quantities of waste generated in the D&D of inactive facilities.

Upon implementation, these methods will provide data that need to be managed in a timely and effective manner. Management of the data can be accomplished through a standardized DOE data base management system dedicated to site characterization, remediation efficacy, and D&D and specifically tailored to programmatic needs.

Conventional remediation technologies are often ineffective and involve high costs. For example, excavation, treatment, and redisposal is the most common process for remediating contaminated soils and waste treatment sludges and sediments contained in underground storage tanks and unlined waste lagoons. Soils needing remediation frequently contain unacceptable levels of radionuclides, heavy metals, and a variety of hazardous organic compounds as well as buried wastes from waste treatment/disposal operations. Robots offer a safe and potentially cheap means of performing hazardous excavation of contaminated material as well as in situ treatment/stabilization.

It is imperative that DOE develop safe, reliable, and cost-effective in situ technologies for remediating contaminated soils and water. Potential in situ technologies include vitrification, bioremediation, and grouting. For contaminated groundwater, when interdiction of the contaminant source is not practical, remediation is generally accomplished by pumping and treatment technologies that are time-consuming, expensive, and burdened with uncertainties as to their overall effectiveness.

A detailed, accurate monitoring program is necessary for thoroughly evaluating the effectiveness of any environmental restoration activity. Monitoring should demonstrate whether site restoration has been successful. The monitoring design should also provide sufficient warning if the restoration activity was not successful, so that adequate time would be available for implementing a corrective action to avoid possible adverse health, safety, and environmental consequences.

The DOE sites themselves are important resources for technology development and may be used as "test beds" for the demonstration and evaluation of new methods.

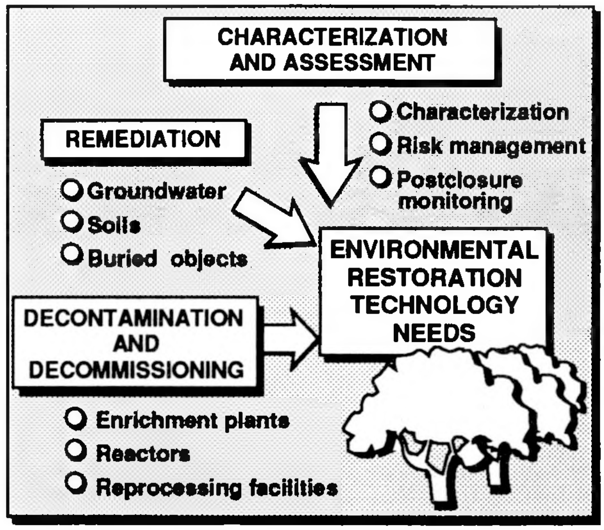


Figure 5.3.4. The needs for environmental restoration technology fall into three categories: (1) characterization and assessment, (2) remediation, and (3) decontamination and decommissioning.

5.3.4.1 TECHNOLOGY NEEDS FOR CHARACTERIZATION AND ASSESSMENT

Lacking powerful tools for proper characterization and assessment, DOE cannot successfully complete environmental restoration.

Present site characterization methods are imprecise, costly, time-consuming, and overly invasive. Improved site characterization methods will require better technologies for accurately describing the subsurface geohydrologic features of a site. For example, more efficient nonintrusive sampling strategies and practical models are necessary for understanding and predicting subsurface transport. Also needed are more reliable procedures for interpreting characterization data (i.e., how clean is clean).

Traditional hydrologic characterization of the subsurface environment is highly dependent on data from groundwater monitoring wells. A thorough understanding of the subsurface environment requires a series of hydraulic tracer tests using a network of monitoring wells. Interpretation is highly dependent on proficiency of the scientific staff, making subsurface characterization highly subjective and at times uncertain. Research is needed to make hydrologic characterization more precise and more cost effective.

Currently accepted analytical procedures [such as in the Environmental Protection Agency's (EPA's) SW-846] do not cover all materials that need to be measured at DOE sites. DOE is working with the EPA and others to alleviate such problems with sampling and analyses.

Intrusive exercises, such as sampling and excavation during remediation of a site, often involve immediate hazards to workers in the form of exposure to radioactive and/or toxic materials. Remote real-time analyses of ambient levels of potential hazards in the air, water, and soil during characterization as well as in the remedial action phase would help ensure worker safety and enable continuous operation. Instrumentation capable of detecting broad classes of hazardous materials and specific compounds is needed to indicate cleanup status. Better characterization methods based on real-time analyses are especially important to confirm the most effective use of certain in situ remediation technologies. In the absence of real-time monitoring, excessive volumes of soil and water must be treated to guarantee compliance; otherwise, pockets of contamination may be missed.

Special characterization technologies are necessary for inactive facilities, underground storage tanks, and wastewater lagoons. These facilities often contain significant quantities of radioactive wastes--in certain cases mixed with heavy metals and/or hazardous organic compounds that make personnel entry unacceptable. Thus the development of advanced robotic samplers, smart probes, mobile and in situ fiber-optic devices, and nonintrusive characterization instrumentation (based on electromagnetic, thermographic, and acoustic principles) is needed for sampling and chemically characterizing these sites. The development of such techniques will significantly reduce radiological exposure to workers and provide more assurance that the correct remedial technology has been selected.

Modeling and risk assessment tools that achieve high confidence levels are necessary to enable appropriate remedial action designs. Especially needed are models that integrate the physical transport of contaminants in air, water, and soil under field-scale conditions with risk-based strategies. Included are models that address the rate of chemical/ biological transformation of contaminants from one chemical form to another. Strategies must be adapted and models developed to expedite the identification and prioritization of sites and the selection of applicable technologies. Modeling efforts are expected to (1) rank the pathways and contaminants of concern; (2) estimate the level of risk reduction; and (3) identify, screen, and evaluate remedial decontamination and decommissioning alternatives.

Improved data management technologies will improve support for environmental restoration. During environmental restoration, large volumes of diverse data are generated to describe site characteristics and contaminant levels in air, water, and soil. These data are often used to guide restoration efforts. Consequently, data management advancements need to provide for rapid storage and retrieval, efficient exchange among locations, and maintenance of high quality. The data base management system needs to be standardized across sites and be accessible throughout the DOE system. The system developed must be able to transfer bulk data between site-specific data bases with graphic interface capability over existing networks. Applications must be developed and incorporated into the data base management system to support the activities of planning site characterization, remediation effectiveness, and resource management.

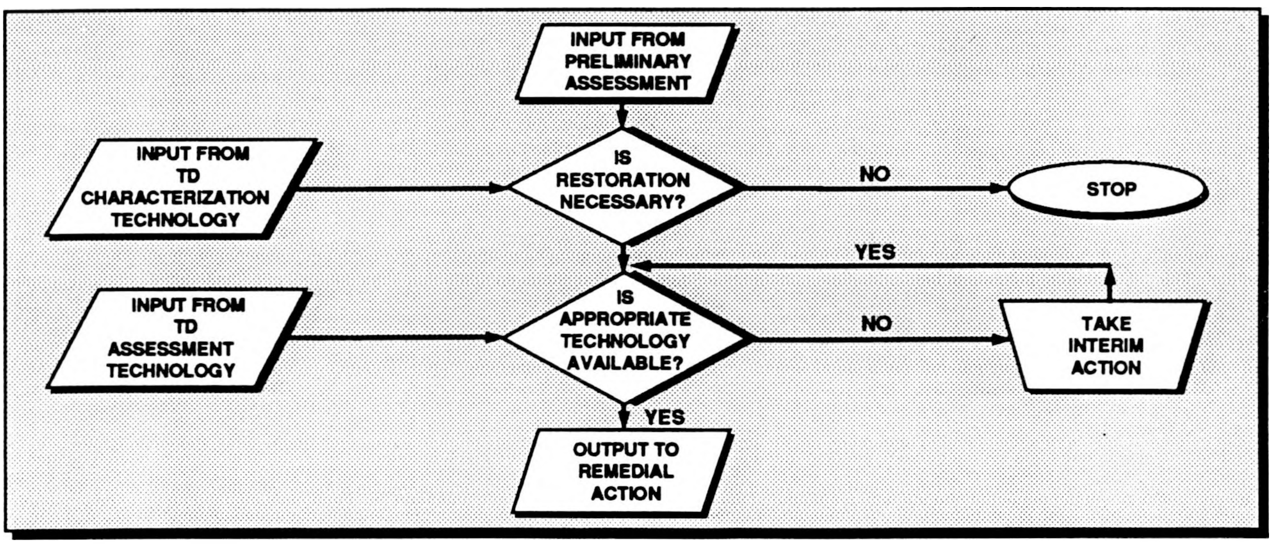


Figure 5.3.4.1. Better characterization and assessment methods are needed to complete environmental restoration. (TD = technology development)

5.3.4.2 TECHNOLOGY NEEDS FOR REMEDIAL ACTION

Innovative remedial action technologies must be discovered, developed, and tested for DOE to meet its 30-year cleanup goal in a safe and cost-effective manner.

Conventional remedial action technologies simply cannot be depended upon for safely retrieving and treating radioactive and mixed wastes stored in underground tanks or waste lagoons or for recovering buried wastes (some of which are explosive, pyrophoric, and contain high levels of radioactivity, heavy metals, and hazardous organic solvents). In other instances, where large volumes of soil contain unacceptable levels of radionuclides, heavy metals, or hazardous organic compounds, conventional technologies that rely on an excavation, treatment, and redisposal approach clearly are neither cost-effective nor environmentally acceptable. Significant technological advances in remediating groundwater are also necessary, especially for dense nonaqueous liquids and for nitrates in deep aquifers, if DOE is to comply with Federal and State groundwater regulations in a safe, rapid, and cost-effective manner.

DOE has a number of contaminated sites for which conventional technologies cannot address remediation safely or effectively [e.g., the waste pits and trenches at the Oak Ridge National Laboratory (ORNL) in Tennessee, and the underground storage tanks at Hanford in Washington]. To address these remediation needs safely and effectively, DOE has instigated a development program to investigate the potential of in situ vitrification. The initial phase of the program began with treatability studies. For example, laboratory vitrification investigations of representative wastes and contaminated soils began in the early 1980s. Subsequent tests have included pilot-scale field demonstrations at uncontaminated sites at ORNL and Hanford. Future development phases include pilot-scale demonstrations at contaminated sites to illustrate the need to thoroughly evaluate the proposed technology before full-scale implementation. A similar strategy is being taken in the development of in situ methods to stabilize wastes in low-level waste trenches in burial grounds, in the development of migration barrier technologies, and in the in situ bioremediation of contaminated groundwaters. To ensure the development of safe, cost-effective technologies that will result in final restoration solutions, a carefully planned and thorough evaluation phase that includes treatability studies and pilot-scale demonstrations under real-world field-scale conditions is required.

Significant advances are being made in the development of other in situ remedial action technologies (i.e., in situ bioremediation of groundwater, grouting of waste trenches, and soil mixing). However, little emphasis has been directed at the development of monitoring techniques, the formation of quality assurance criteria, or the evaluation of standards to determine their long-term effectiveness. A remedial action technology should be accepted only after performance criteria are established and demonstrated. To do this, advancements in monitoring and control of remediation techniques are needed. Better real-time control and sampling techniques need to be developed to ensure that in situ technologies perform in the field as they do under laboratory conditions. For example, automated real-time methods need to be developed to evaluate the effectiveness of groundwater treatment using high-resolution instruments to determine rates of treatment, groundwater flow velocity, and concentrations of substrate and final products. Potential technologies include automated in situ or remote-controlled fiber optics and other sensing devices fed into computerized data processing systems.

In certain cases, multiple technologies will be required to complete restoration. For example, the restoration of burial grounds will require the stabilization of buried wastes (and possibly installation of impermeable covers over the waste trench areas) as well as groundwater treatment. Decisions will be needed as to the timing and analyses of potential interactions of each action. Restoration will require the development of new methodologies or the modification of existing methodologies for selecting, screening, and ranking these various remedial actions.

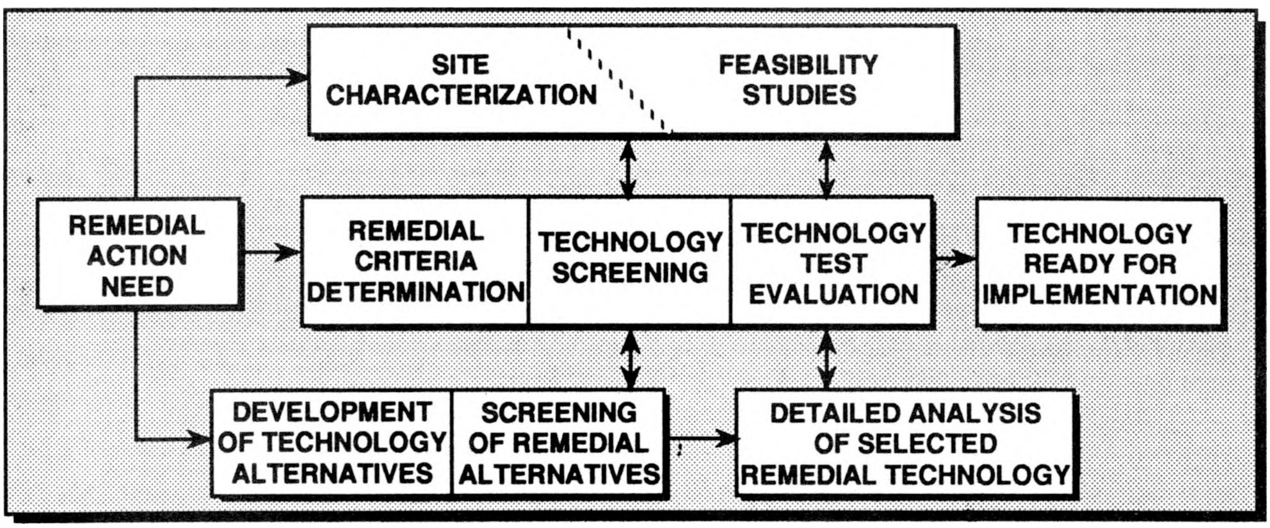


Figure 5.3.4.2. The development of innovative remedial action technologies will require a systems approach.

5.3.4.3 TECHNOLOGY NEEDS FOR DECONTAMINATION AND DECOMMISSIONING

Three nuclear fuel cycle stages present immense challenges for decontamination and decommissioning (D&D).

Uranium enrichment and fabrication facilities, nuclear production reactors, and fuel reprocessing facilities (see Figure 5.3.4.3) all include massive structures that are contaminated with radionuclides and, in many cases, hazardous materials. Technology development is needed to ensure that D&D processes used are cost- effective and that they meet all health, safety, and environmental regulations. Many of the presently available decontamination processes are expensive, create too much waste, and require modification to satisfy current regulations.
Innovative approaches are necessary to solve these needs. For example, facilities to be decontaminated range from underground storage tanks and hot cells to mammoth uranium enrichment and plutonium processing plants. Each has radiation fields and, in some instances, toxic substances contained in or on equipment that is difficult to remove because of its unique and complex design. To reduce worker exposure and D&D time, technology is needed to remotely (1) identify the quantity and characteristics of contamination [i.e., low-level/high-level radioactive, Resource Conservation and Recovery Act (RCRA) hazardous, and mixed waste]; (2) perform decontamination and piping/equipment removal; and (3) reduce waste volume and potentially obtain recyclable materials.

Decontamination technologies that minimize waste are essential. Present D&D processes generate large volumes of waste that are difficult or impossible to recycle or reduce in volume. These large volumes of waste require treatment, packaging, storage, transportation, and ultimately disposal. Most of the waste is radioactive and must comply with DOE Order 5820.2A. Waste not contaminated with radioactivity is typically subject to RCRA or Toxic Substances Control Act regulations and must meet land disposal restriction regulations. Those containing both radioactivity and RCRA wastes must be treated as mixed waste. To reduce the volume of waste disposed, technologies must be developed that effectively characterize, destroy, decontaminate, recycle, and compact waste.

Technologies must be developed that address chemically contaminated as well as radioactively contaminated waste. Especially important are processes for the decontamination of lead-bearing metals. The development of better metal-cutting methods that do not generate airborne particulates, create fire hazards, or generate melts that contain RCRA or radioactive contaminants is badly needed. More emphasis needs to be placed on generating recyclable wastes or wastes that can be decontaminated. For example, the possibility of recovering aluminum and lead from D&D activities via advanced refining/smelting processes has been demonstrated and needs to be implemented. Also, better methods need to be developed to remove surface layer contamination (i.e., large volumes of concrete waste are generated simply due to surface contamination). Conventional technologies rely on blasting with sand and/or glass because such processes do reduce the overall volume of waste; however, they also generate airborne particulates (which are difficult to contain, creating an unsafe work environment) as well as relatively large volumes of secondary waste often requiring further treatment before disposal. Alternatives to sand/glass as blasting media, such as dry ice (CO_2) or plastic media, need to be investigated.

Real-time monitoring and analytical tools are needed to provide for worker safety and enable accurate cleanup activities. The development of robotic and/or remote systems may be the only means for safely conducting D&D activities in highly contaminated facilities. In addition to radionuclides, chemically hazardous materials must be removed, often from tightly congested areas with minimum access for viewing and ventilation. Robotic systems need to be developed for cutting, sectioning, and packing contaminated pipes, tanks, etc. These systems need to include analytical sensors with automated output to computers so that environmental and characterization data can be stored. In addition to providing safe working conditions for D&D personnel, the development of these robotic technologies will allow the minimization of process residues (via selection and characterization capabilities) and the production of residues that can be recycled or decontaminated.

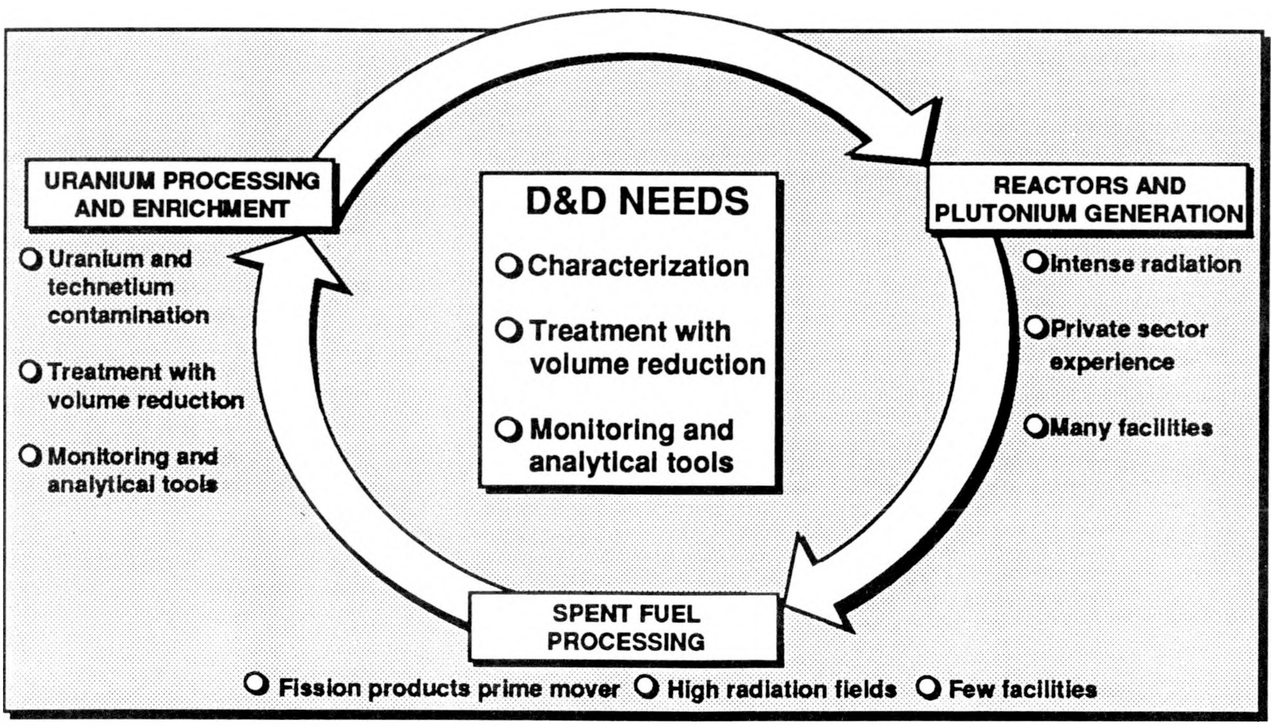


Figure 5.3.4.3. Technologies must be developed to conduct decontamination and decommissioning (D&D) safely and cost effectively for facilities used in each of the major fuel cycle steps.

5.4 EXPECTED BENEFITS FROM NEW INITIATIVES IN TECHNOLOGY DEVELOPMENT

Projects planned for the next five years will yield new, more effective technologies that reduce costs and decrease health and/or operational risks associated with waste operations and environmental restoration activities.

DOE has embarked on an aggressive program to improve operating practices within its facilities and to restore the sites to regulatory standards within 30 years. Cost estimates vary; some recent estimates are near $150 billion (Testimony: C. A. Bowsher, GAO/T-RCED-89-6, February 8, 1989), up from early estimates of $40 billion. The benefits of technology development (TD) are faster restoration of DOE sites, more accurate characterization of environmental problems, more effective waste treatment, lower overall cost, a dramatic reduction in the quantity of waste generated, and less exposure of workers and the public to hazardous materials.

A number of groups will benefit from TD activities. The affected public will have decreased health and safety risk from site cleanup and improved operations. Employees will have decreased exposure to toxic and radioactive material. Taxpayers will benefit significantly from reduced cleanup costs. Regulatory agencies will receive better techniques for establishing compliance and an improved basis for negotiation with DOE on cleanup schedules and standards. The DOE Defense Programs Office will achieve a more reliable and efficient production system.

Current remedial technologies involving excavation, treatment, and redisposal of contaminated soil and pumping and treatment of groundwater are either not technically adequate or are too expensive to meet the schedule for cleanup. Field demonstrations of innovative in situ soil treatment technologies are expected to lower soil treatment operational costs.

The development of more effective waste treatment, storage, and disposal technologies will result in less secondary waste, reduced waste toxicity, separation of radioactive constituents, changes in the form of radioactive waste, and greater assurance of containment after disposal.

Waste minimization efforts attempt to reduce the quantities of waste being generated in the DOE system as a result of production operations, decontamination and decommissioning, and environmental restoration by means of material substitution, process changes, and better operations management. The benefits of a TD program in waste minimization are less waste to treat, store, and dispose of; fewer health and environmental concerns; and a major contribution toward regulatory compliance.

Supporting technologies increase the effectiveness of waste minimization, waste operations, and environmental restoration techniques. Waste minimization activities can be guided by a process waste assessment model. Advancements in sensors, sampling, modeling, and geostatistical methods will facilitate the interpretation of site characterization data, and remedial action can be tailored to a specific site, thereby, avoiding the old practice of "if in doubt, dig it out."

There are two types of benefits associated with cost savings from TD. Direct cost savings accrue from using innovative technology as substitutes for existing technologies. Cost avoidance savings result from reductions in the use or elimination of other processes and resources. Data collection is difficult, so caution must be exercised when estimating cost savings from TD. TD will constitute 10 percent of the annual DOE Office of Environmental Restoration and Waste Management budget for a total of about $1 billion over the next five years.

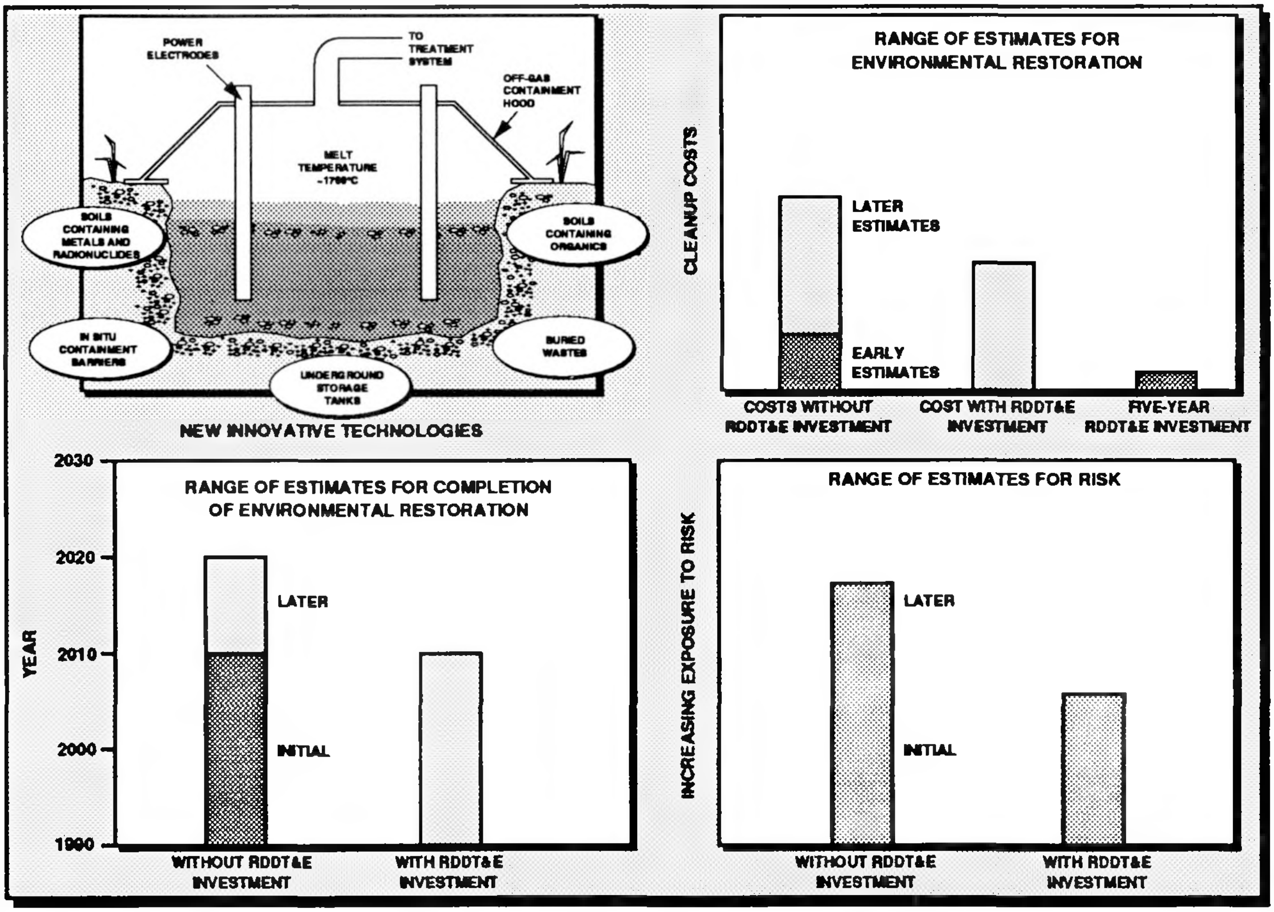


Figure 5.4. Investment in research, development, demonstration, testing, and evaluation yields new innovative technologies that enable the Department of Energy cleanup program to be cheaper, faster, and safer.

5.4.1 BENEFITS OF WASTE MINIMIZATION

Preliminary estimates indicate waste minimization may reduce waste treatment, storage, and disposal (T/S/D) costs by $10 billion over 10 years. The technology also reduces worker exposure and public risk.

The implementation of a comprehensive waste minimization program will result in reduced volumes of waste to manage, accompanied by corresponding decreases in waste T/S/D costs, lower risks to workers and the public, and increased confidence in the DOE Waste Management Program by regulatory agencies and the public.

At this stage of the program in waste minimization, cost savings due to technology development cannot be estimated with confidence, but it is possible to make a case not only for improved operations but also for significant cost reduction. The most important benefit of waste minimization, of course, is simply the result that with smaller volumes of less toxic material to handle, risks to workers or the public will be lowered. Costs will be reduced as well through waste minimization.

Preliminary estimates of cost savings presented in the Draft Applied Research, Development, Demonstration, Testing, and Evaluation (RDDT&E) Plan (Section 2.3.6.1 and Appendix) for several specific waste minimization achievements amounted to billions of dollars when extrapolated to operational lifetimes for processing plants.

New DOE waste-handling facilities to achieve compliance with existing and proposed regulations, given current waste generation rates, will cost billions of dollars. If the goals of 60 to 80 percent waste minimization were achieved (Section 5.3.1), savings in the nuclear weapons complex are expected to be at least $10 billion for lowered T/S/D costs. While this estimate is not currently supported by a formal cost-benefit analysis, just such an analysis is planned for FY 1990-1991.

Review of the ongoing depleted uranium manufacturing waste minimization program indicates other waste minimization benefits. Manufacturing techniques, such as enclosed equipment for net shape metal forming, nonhazardous chemical usage, and process optimization, significantly improve the nuclear material usage and processing efficiency, resulting in reduced emissions in the workplace and a smaller scale operation with no loss in capacity. Consequently, worker protection will improve, and risk to the public should be reduced.

DOE-sponsored research and development in nuclear and nonnuclear materials processing will provide technology that can be used by the private sector. U.S. industry, particularly for hazardous waste, faces many of the same technical problems as the DOE complex.

Waste minimization technology provides a benefit beyond return on investment and reduced risk: it signals the end of the recurring waste problems within the DOE production complex. Based on Office of Technology Assessment estimates, significant waste minimization can be achieved by a combination of tighter administrative procedures and the development of new technologies. It has been demonstrated in the commercial nuclear industry that a formal waste minimization program can reduce waste volumes by as much as 20 percent in the first year and by as much as 50 percent in the first five years. (See Nuclear News, March 1987.) With the timely development of promising technologies, it is projected that the overall waste volume reduction goals of 60 to 80 percent can be achieved over 10 years with capital monies for new manufacturing hardware at production plants.

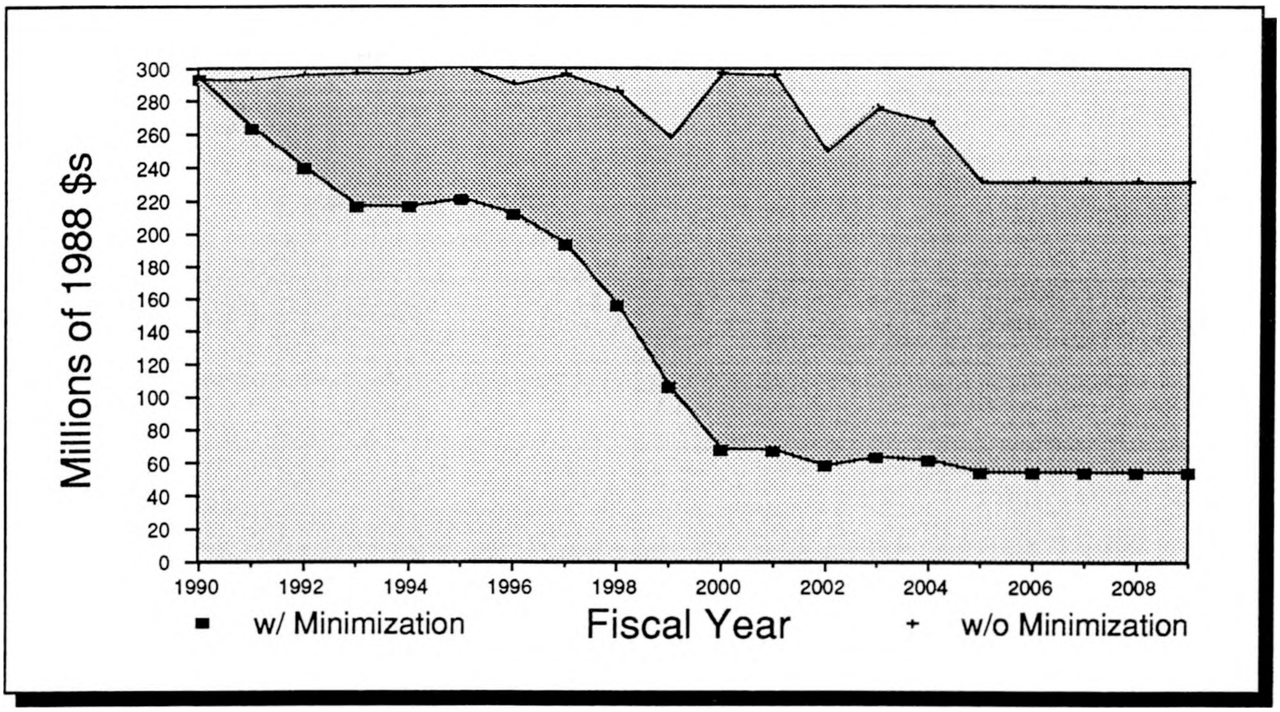


Figure 5.4.1. Minimizing low-level waste and transuranic waste could result in cost savings of $2.7 billion (constant 1988 dollars) during the next 20 years.

5.4.2 BENEFITS FOR WASTE TREATMENT, STORAGE, AND DISPOSAL

A variety of benefits stem from more effective waste operations: lower costs; reduced risks (public, occupational, and production); and less impact on the environment.

Waste operations treat, store, and dispose of radioactive (high-level, low-level, and transuranic); hazardous; mixed hazardous; and sanitary wastes. The wastes to be treated and disposed of result not only from ongoing facility operations but from environmental restoration operations at inactive site facilities. The technical goal (and a primary benefit) of waste treatment is to process waste into a stable, safe physical form that can be stored or sent to permanent disposal. Waste storage and disposal practices have greatly improved over early techniques that were sometimes only marginally controlled. Regulatory requirements stipulate that DOE adopt a new way of performing its mission. Waste operations technological development projects will make major contributions to either increasing effectiveness, reducing cost, or both.

Regulatory compliance is a major benefit. New legal requirements that apply to Federal facilities prevent the continuation of traditional waste operation techniques. A variety of legislation proscribes the activities of waste operations: Resource Conservation and Recovery Act (RCRA); Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) [as amended by Superfund Amendments and Reauthorization Act (SARA)]; Clean Air and Water Acts; Toxic Substances Control Act (TSCA); and DOE Orders. This legislation either limits or prohibits many formerly acceptable waste management practices and constitutes a challenge to DOE in maintaining the operation of critical facilities within a safe and environmentally acceptable framework. The most significant problems are stringent standards for mixed waste treatment; prohibition of land disposal; and prohibition on storage of certain mixed wastes except accumulation of sufficient quantities to facilitate treatment, recovery, or disposal of waste. CERCLA and Section 3004(u) provisions of RCRA tie the issuance of operating permits for active solid waste management sites to the plans for cleanup of inactive waste sites. Therefore, effective waste operations resulting from applied research and development therefore take the lead in preventing current and future compliance problems.

Risk management is a key factor in DOE's goal of doing things right. There is the risk associated with the health and safety of facility employees and the public from exposure to radioactive and/or chemical agents. Decisions can be made regarding the levels of risk considered acceptable (risk can never be totally eliminated); and the identification of areas where current practices are acceptable. Risks are also associated with financial liability to the Government and to national security. National defense production activities can be severely affected by regulatory consent decrees to cease operations. Prudent investment in waste operations technology will not only make the DOE system safer but more reliable.

Cost savings must be viewed from the context of the entire DOE system. An example of direct cost savings is when waste treatment operational costs may be lowered by more efficient methods. Detoxification can permit simpler disposal methods--perhaps using commercial vendors. Waste operations technology development can be performed with an eye toward facility operations. Another form of cost savings is when waste operations can indirectly prevent even greater expenditures in production operations to change a process, redesign a product, or build a new facility. Waste treatment can also reduce the volume and toxicity or change the form of a waste, which permits simpler, cheaper transportation packages and procedures.

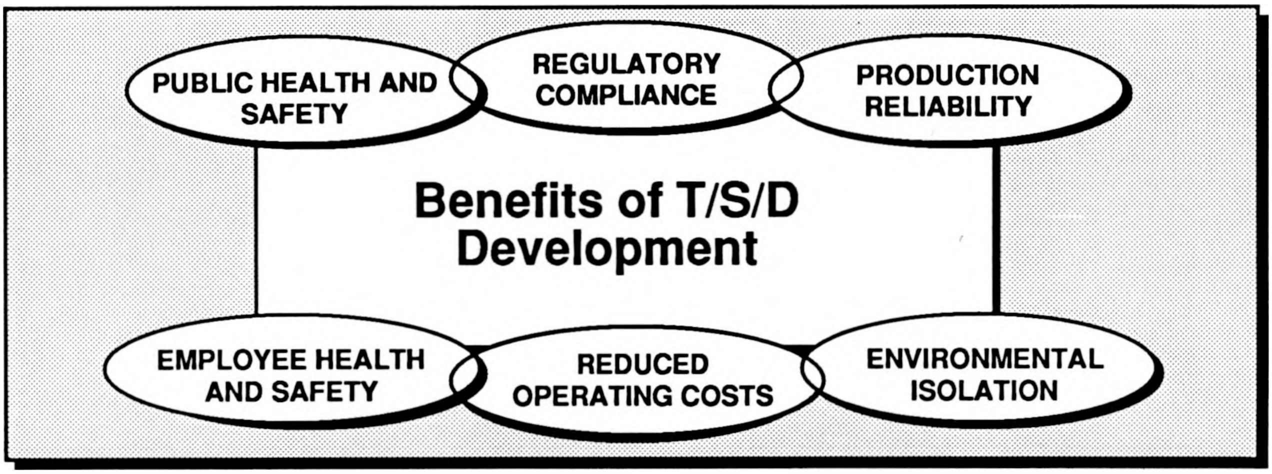


Figure 5.4.2. Development of improved waste treatment, storage, and disposal yields multiple benefits for the Department of Energy and the public. (T/S/D = treatment, storage, and disposal)

5.4.3 BENEFITS FROM IMPROVED ENVIRONMENTAL RESTORATION TECHNOLOGY

Benefits from technology development include improved site characterization methods and faster, more efficient, and less expensive processes for remediating contaminated soils and groundwater.

Aggressive development of environmental restoration technologies will provide a variety of benefits in terms of reduced costs, reduced risks (public as well as occupational), and lower environmental impacts as full-scale cleanup efforts mature over the next five years. In certain instances, the chief benefit of technology development will simply be the ability to conduct environmental restoration. For example, specific sites within the DOE system cannot be restored without fundamental changes in cleanup technology; that is, environmental restoration cannot be accomplished with present technology. In these cases, technology development is a prerequisite to environmental restoration, and the major challenge is to develop the methodology in the safest, most efficient, and most cost-effective manner. The major benefits in terms of cost will be realized when these new and improved technologies are used in subsequent years to meet the DOE 30-year goal of achieving compliance and accomplishing the environmental restoration of its sites.

To best meet these needs, the Office of Technology Development initiated projects addressing improvements in drilling technologies; development of in situ characterization techniques (e.g., application of fiber optic sensors to detect wastes in soils and other analytical tools to assess real-time contaminant levels in groundwater); development of improved decontamination and decommissioning technologies; and testing and evaluation of in situ remediation processes to treat contaminated soils, waste sites, and groundwater.

Benefits from implementation of these projects will be shared by operators of the DOE plants, personnel working in waste management, scientists and engineers, and the general public. Benefits take the form of lower costs, faster and more efficient restoration methods, and reduced risks in the handling and disposing of waste. For example, development of robotic excavation devices will greatly benefit the safe cleanup of soils containing buried explosives and pyrophoric objects. Also, cryogenic barriers around "super hot" or "highly toxic" buried waste or leaking underground storage tanks could be used to effectively interdict sources of contamination to groundwater as well as to provide a method for safer retrieval and treatment of such waste forms. Real-time monitoring of ambient volatile organic compounds and toxic metals in soils and groundwater coupled with exotic sensors (biosensors) to monitor toxicity levels will benefit assessment efforts regarding the degree of cleanup. Costs will be avoided because restoration will be restricted to only those site areas found to be contaminated; whereas, without these capabilities, conventional restoration processes often include excessive quantities of "clean" soils and groundwaters.

Most benefits, monetary as well as nonmonetary, will not be immediate but will result over the longer term as these developments are tested in laboratory and pilot-scale experiments and are demonstrated under real-world field conditions. Data are not available to conduct detailed specific benefit-cost analysis; however, preliminary assessments indicate major savings by implementing technology developments.

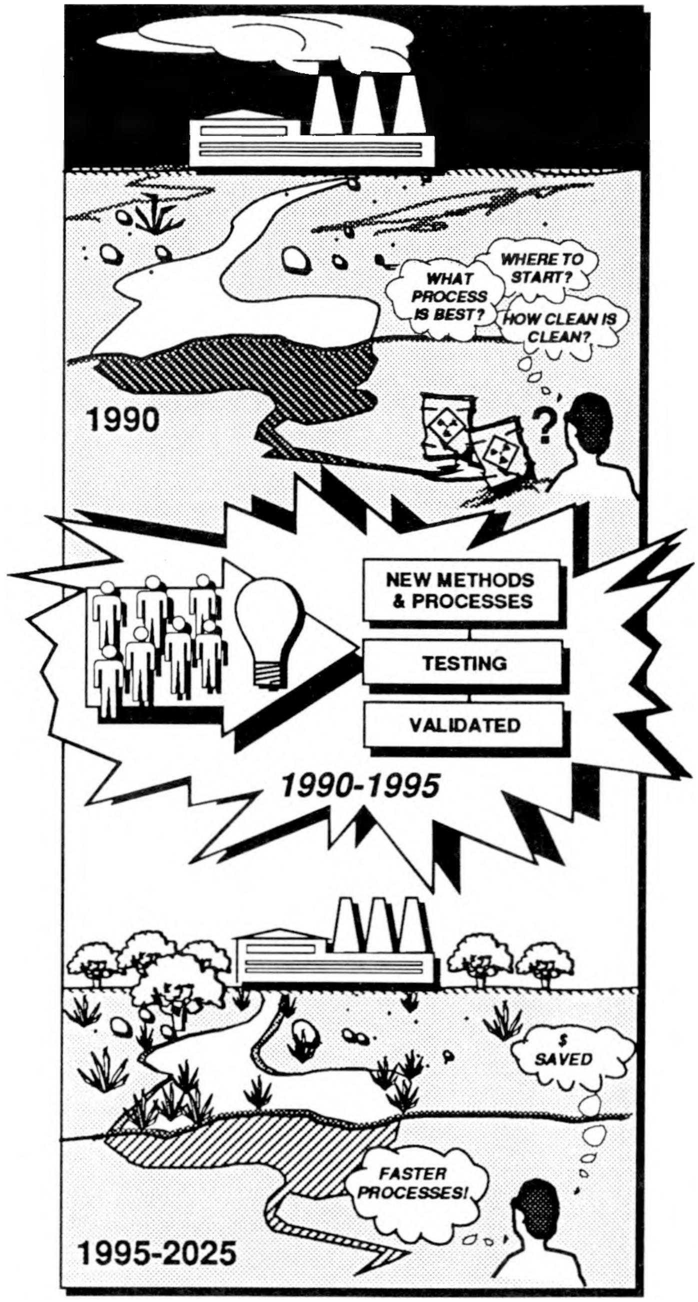


Figure 5.4.3. Technology development will benefit in faster, more efficient, and less expensive environmental restoration of Department of Energy sites.

5.5 PROGRESS IN PLANNING FOR TECHNOLOGY DEVELOPMENT SINCE THE NOVEMBER 1989 DRAFT RDDT&E PLAN

Public sector and technical community participation in design of technology development has enabled DOE to establish an intelligent planning process.

Overview: This FY 1992-1996 Five-Year Plan represents planning for the Office of Technology Development (OTD) since its formation in November 1989. Comments from the public and the field have been used in preparation of the update and in organization of OTD.

The Draft Research, Development, Demonstration, Testing, and Evaluation (RDDT&E) Plan, the foundation document for technology development planning, was issued for review and comment with a press release dated November 9, 1989. Comments were specifically solicited from the National Academy of Sciences-National Research Council (NAS-NRC), other Federal agencies, State governments, Indian Tribes, industry, and many universities, as well as from the DOE technical community.

The comments received ranged from letters of acknowledgment to specific expressions of individual concerns and interests to extensive reviews of the Plan. A special meeting was held with the NAS-NRC Radioactive Waste Board on December 14, 1989, to discuss the Plan. This update benefits from the comments received. In addition, specific responses to reviewers have been developed where appropriate.

Trends in Comments: The comments to the RDDT&E Plan, which were received from 22 organizations, were generally supportive. Many respondents offered support for the policy issues described in the Plan through technical level participation.

Technical comments were primarily directed toward specific segments of the Plan and offered helpful suggestions or recognition of the breadth of the technical challenge presented by the needs explicitly identified in the Plan.

Other Planning Activities: OTD has been established, 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 and Waste Operations was held December 12-14, 1989, to provide guidelines for industry, university, and other Federal agency participation. National technical programs for waste minimization and for robotics development have begun.

Two pilot programs for DOE-university partnerships have been established. Planning and funding for Environmental Restoration and Waste Operations outreach to precollege students has been initiated, and a fellowship/scholarship program for historically black colleges and universities has been established.

Memoranda of Understanding have been signed with the U.S. Air Force and the Environmental Protection Agency (EPA) for cooperative efforts on environmental restoration and waste minimization research. Together with DOE technology development, multiple-party funded projects provide each agency with greater value than each would receive from its limited resources. Continued collaboration of the Department of Defense (DOD), DOE, and EPA research plans is under way.

Generic waste minimization problems and technology needs by site have been identified. A process and waste assessment effort has been proposed. The Waste Reduction Steering Committee representing each major operating division of DOE reviewed the assessment methodology and is studying plans to institute the practice. The methodology is compatible with EPA recommendations for hazardous waste assessments and helps identify the operational technology needs for source reduction.

The largest waste minimization project initiated by OTD is the depleted uranium waste minimization technology program at the Y-12 Plant in Oak Ridge. It has provided insights on needed technology that reduces uranium low-level waste and mixed waste quantities. The technology (1) improves material usage efficiency from uranium that forms through fabrication and recycle/recovery operations and (2) integrates technology from both national laboratories and DOD research programs.

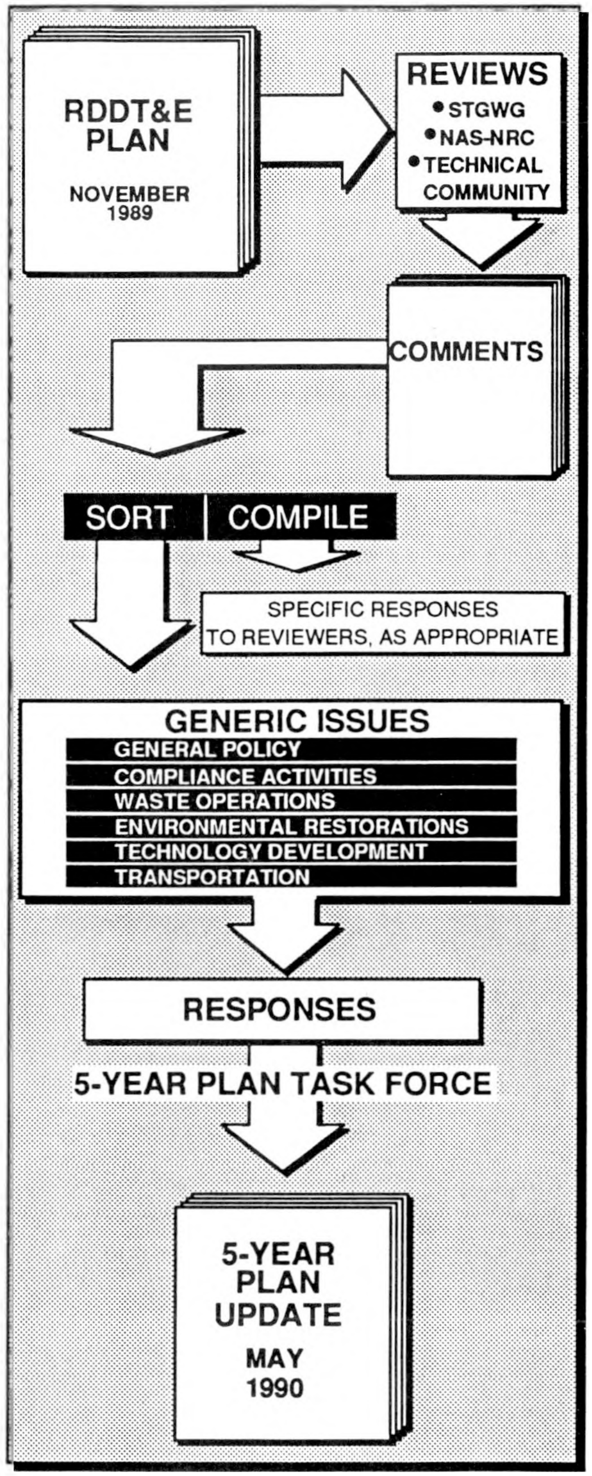


Figure 5.5. Comments on the Research, Development, Demonstration, Testing, and Evaluation (RDDT&E) Plan were used in preparing this update to the Five-Year Plan. (NAS-NRC = National Academy of Sciences-National Research Council, STGWG = State and Tribal Government Working Group)

5.6 PRIORITIZING OFFICE OF TECHNOLOGY DEVELOPMENT ACTIVITIES

DOE initiated and will continue to develop a rigorous, consensus-based prioritization and selection process to provide the technologies required over the next two decades for safe, expeditious, and economical completion of Environmental Restoration and Waste Management operations.

<u>Current Prioritization and Selection</u>: Over 1,000 Research, Development, Demonstration, Testing, and Evaluation (RDDT&E) proposals have been received by DOE's Office of Technology Development (OTD) for evaluation and priority ranking. Although the full development of the prioritization and selection process is not complete, a preliminary approach was developed and used for allocating FY 1990 funds. This effort allowed testing of the basic approach and helped to determine the depth of information required in future proposals to allow adequate technical review and evaluation.

The goal of OTD's prioritization process is to select top-ranked proposals that best improve Environmental Restoration and Waste Management operations. General areas of needed technology, such as characterization and waste minimization technologies, have been identified by Environmental Restoration and Waste Management. The preliminary process used for allocating FY 1990 funds involved sorting the proposals by these general technology areas. For FY 1990, selections were made primarily on the basis of subjective judgments by OTD considering recommendations from peer review groups. However, as a part of this process, a scoring and ranking methodology was drafted and tested on a subset of the total proposals received. Scoring was performed according to a set of attributes:

- reduced public and environmental risk,
- reduced environmental restoration/ waste management costs,
- reduced remediation and decontamination and decommissioning time,
- reduced waste generation,
- development costs,
- likelihood of technical success,
- timeliness of availability,
- expected regulatory and social acceptance,
- innovation, and
- teaming.

As part of the process, those proposals that appeared to be redundant were flagged and set aside pending resolution. This process resulted in a ranked set of proposals for each technology needs category. These categories, along with those of transportation, education, and program support, are discussed in more detail in Attachment D. Final selections of proposals within each category were made by OTD considering both the ranking and independent recommendations from a number of peer review groups.

<u>Future Prioritization and Selection</u>: OTD recognizes that much needs to be done to achieve a rigorous, consensus-based prioritization methodology for RDDT&E activities. Final relative attribute weights have not yet been selected nor have the administrative procedures for prioritization been formalized. OTD is responsible for

conducting this development process and for obtaining independent review.

Future efforts will:

- develop a formal, institutionalized Environmental Restoration and Waste Management needs analysis to ensure properly focused RDDT&E activities;
- define the required depth and content of RDDT&E proposals and associated cost-benefit analyses;
- refine the generic technology categories;
- improve the ranking attributes;
- establish an explicit relationship to the Environmental Restoration and Waste Management prioritization process;
- identify appropriate peer reviews;
- prepare roadmaps identifying specific time-phased technology development links to Environmental Restoration and Waste Management activities;
- establish a specific DOE-Headquarters Environmental Restoration and Waste Management, and Technology Development coordination/review group to ensure Environmental Restoration and Waste Management needs are continuously reflected in the RDDT&E Program;
- establish a systematic Environmental Restoration and Waste Management and Technology Development review process to avoid duplication within DOE and with other Federal agencies; and
- establish specific workshops and symposia to promote continuous feedback to OTD from Environmental Restoration and Waste Management users, industry, and the public.

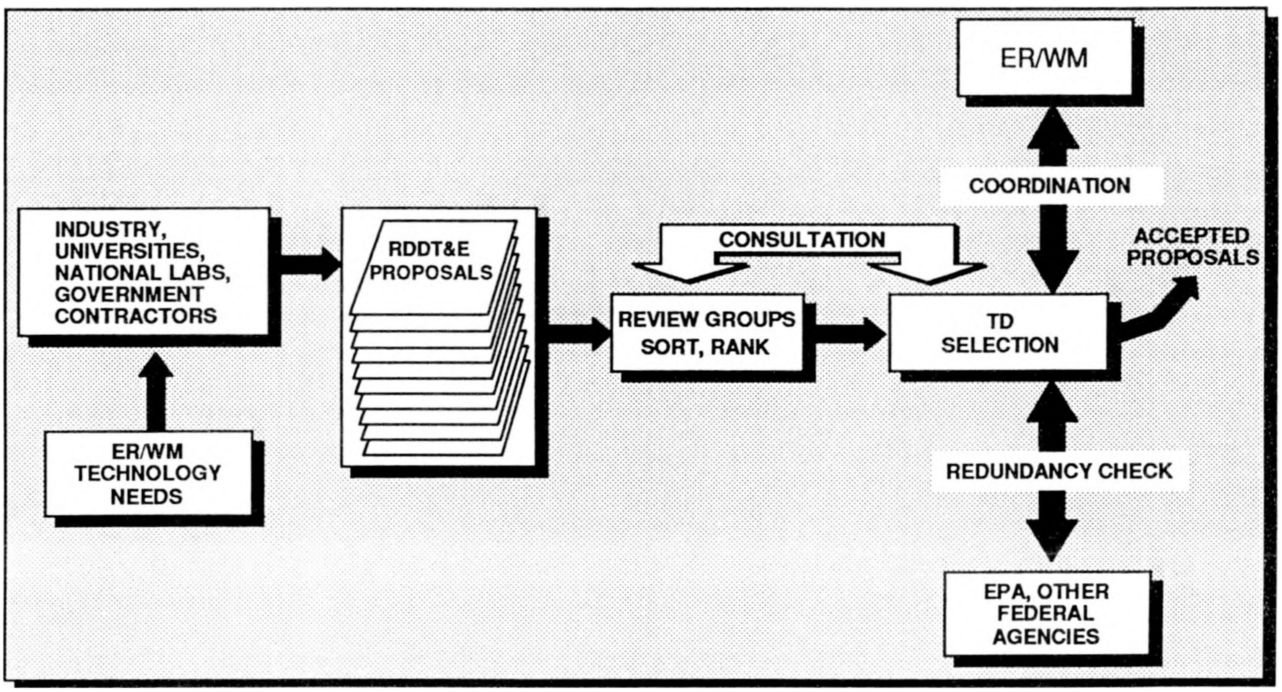


Figure 5.6. Selection of proposals are made by the Office of Technology Development considering the priority ranking within Environmental Restoration/Waste Management technology needs categories and the independent recommendations from peer review groups. (ER = Environmental Restoration, WM = Waste Management, EPA = Environmental Protection Agency, TD = Technology Development, RDDT&E = Research, Development, Demonstration, Testing, and Evaluation)

5.7 DETERMINING HUMAN RESOURCE NEEDS FOR THE OFFICE OF ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT

The planning for human resource development described in the Research, Development, Demonstration, Testing, and Evaluation (RDDT&E) Plan was initiated, and activities are in progress to implement a balanced, effective education program, reaching all strata of the education infrastructure and based on a needs-driven management approach.

The Education Development Program's mission involves the development and support of the required educational infrastructure to educate and train the human resources necessary to meet DOE's 30-year cleanup goals. Program development is based on identification of human resource needs, both in number of personnel and skills required and educational infrastructure needs--the curricula, faculty, training, and support required to accomplish the mission. Resources available have been assessed, and based on the variances between needs and available resources, programs have been structured to bridge the gap.

Program planning and needs analysis have established a framework for the Education Development Program. The initial emphasis is directed toward supporting technician training, undergraduate curriculum development, minority support, technical professional retraining, and graduate research.

The status of activities for Outreach, Training, and Education are discussed in Section 5.7.1.

The largest activity of the program from a budget perspective is the DOE/Academic Partnerships. The implementation status of this activity is discussed in Section 5.7.2.

<u>Planning and Support</u>: Current planning and support activities under way this fiscal year that must be maintained over future years follow:

- An Office of Environmental Restoration and Waste Management (EM) employment and education assessment that identifies the science, engineering, and technician occupational employment required for EM work (Figure 5.7).
- Studies on specific programs to develop technician/technologist skills for personnel doing the hands-on testing, field, and laboratory work.
- A Training Resources and Data Exchange (TRADE) study cosponsored with Defense Programs (DP) and Environmental Safety and Health (EH) to address environmental, safety, and health training requirements for DOE and contractor staff.
- A Task Force on Education to review the activities and plans of the Education Development Program and to provide timely advice and feedback on ways to enhance program effectiveness.
- Education implementation planning to focus resources in areas of greatest payback and effectiveness in meeting DOE goals. Issues such as targeting outreach activities, shifting from two- to four-year institutions, determining the most effective intervention strategies for attracting students to EM careers, and involving Native Americans and other minorities are addressed.

- Support to historically black colleges and universities (HBCU), minority institutions groups to help the initial startup of programs for minority fellowships and scholarships, as well as other activities has been provided.

The Education Development Program is committed to implementing the program with the full coordination and cooperation of other Federal agencies. Many similar programs must be coordinated among DOE, the Department of Education, the National Science Foundation, and others. The integrated efforts of all the Federal agencies are required for success.

The employment assessment study being performed by Oak Ridge Associated Universities addresses EM staffing patterns, heavily utilized occupations in EM activities, and adequacy of supply concerns. Preliminary results indicate a significant work force growth over current levels by 1995. The figure shows the current occupational skill mix among technicians, engineers, and scientists. The study also identifies some hybrid occupations and specialties that will be required. The study takes into account the impact of turnover and assesses the adequacy of supply for key disciplines with probable shortages.

The results of the employment assessment currently indicate a substantial demand for technicians and predict further demand growth in the future. To meet this need, activities are planned to increase the support to community colleges offering courses for EM-related technician training.

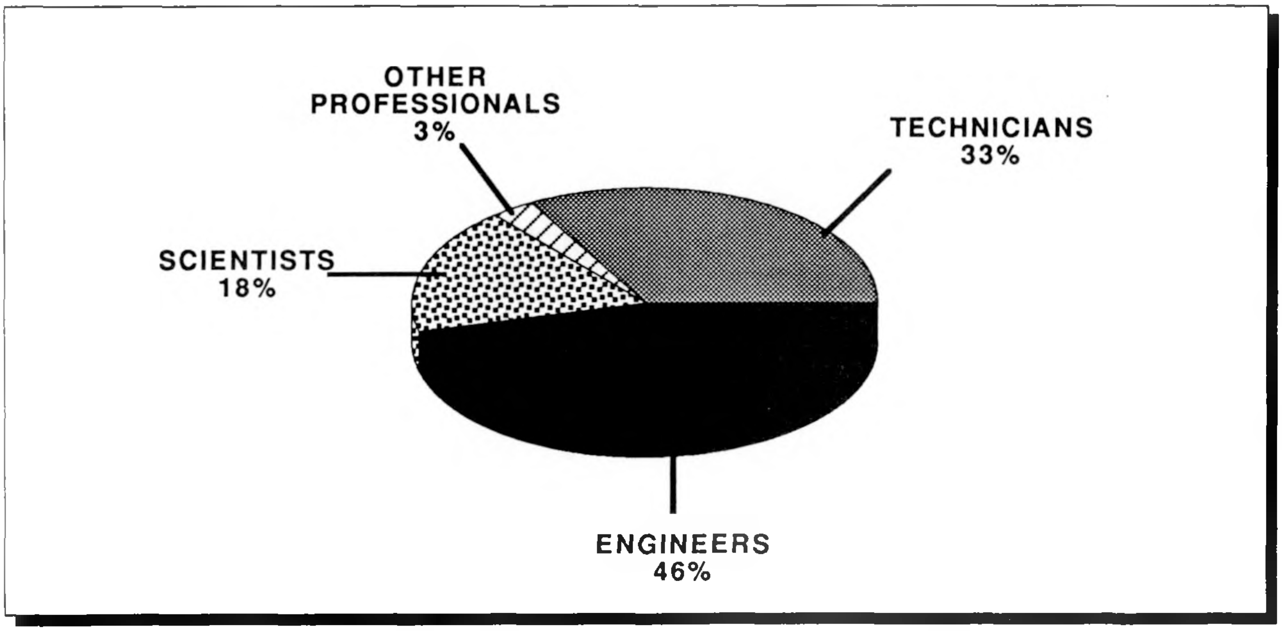


Figure 5.7. Occupational resources needed for environmental restoration and waste operations include engineers, technicians, scientists, and other professionals.

5.7.1 STATUS OF EDUCATION INITIATIVES: FELLOWSHIPS, SCHOLARSHIPS, FACULTY AWARDS, AND OUTREACH

The activities for training, education, and outreach are being implemented in FY 1990. Additional activities are being investigated to broaden the program, and performance measures are being applied to assess effectiveness.

Training and Education: The Training and Education program consists of activities such as workshops, training/retraining, fellowships, scholarships, and faculty awards. Like the academic partnerships, these activities represent a substantial ongoing financial commitment, which is an investment. In addition to these activities, a proactive Academic Program Development activity is planned to attack, on a long-term basis, the root problems that have caused much of the current human resource crisis, for example, scientific illiteracy, declining interest in science and technology careers, etc.

Fellowships are planned for students studying in areas of Environmental Restoration and Waste Management, with the initial cycle of fellowships awarded to ten advanced degree candidates majoring in nuclear engineering, civil engineering, microbiology, environmental health engineering, environmental water resources, and hydrology/hydrogeology. The next cycle of ten fellowships will be awarded in FY 1991.

Nationally competitive scholarships will be awarded at two- and-four-year academic institutions to develop the highest quality students to participate in the environmental challenge. A total of 25 scholarships are planned.

A minority scholarship/fellowship program will be supported to encourage students from historically black colleges and universities and minority institutions to take courses in the technical curriculum leading toward degrees with Environmental Restoration and Waste Management emphasis.

University teaching and research for technically oriented missions are required to support Environmental Restoration and Waste Management activities. Faculty awards will be supported for institutions and faculty that desire to participate in activities to enhance skills of faculty members and to develop curricula to support the Office of Environmental Restoration and Waste Management (EM) mission.

Outreach: The Outreach Program consists of two initiatives: an Operations Office initiative, which is specifically structured to achieve the regional objectives and needs of each Operations Office, and a Headquarters initiative, which is national in scope and perspective.

In the near term, funding has been infused through the Operations Offices to have an immediate impact on raising awareness among precollege students and teachers across the educational spectrum of issues and needs of Environmental Restoration and Waste Management.

In the long term, selected programs will be developed to enhance science, mathematics, and technology curricula to attract primary and secondary school students into the science and engineering fields related to Environmental Restoration and Waste Management. This is a long-term challenge and requires academic program development, including maximizing the impact by working through precollege teachers and establishing partnerships with precollege educational institutions. Whenever practical, existing organizations, such as professional societies, should be called upon to help this effort. For maximum impact, the academic program development requires coordination between EM and other DOE programs that are conducting similar programs.

Outreach activities are required to have the following characteristics:

- Emphasize outreach to women, minorities, and other groups traditionally underrepresented in technical careers.
- Structure these programs for measurable results, impacting a large student/teacher population on a long-term basis.
- Take full account of existing programs/capabilities to avoid duplication and demonstrate early results.
- Have defined measures of success.

As the Educational Program Development initiatives are implemented, the program will measure and assess the performance of each activity. Successful programs and activities will be enhanced and strengthened with increased resources. Programs and activities that fail to meet DOE's goals will not be supported. The dynamic nature of these initiatives requires a strong management oversight by the Department to direct the programs and to ensure that continual focus on Environmental Restoration and Waste Management issues is maintained. DOE is committed to ensuring accountability in the conduct of these programs and to maximizing the progress toward meeting the human resources needs required to meet its 30-year cleanup commitment.

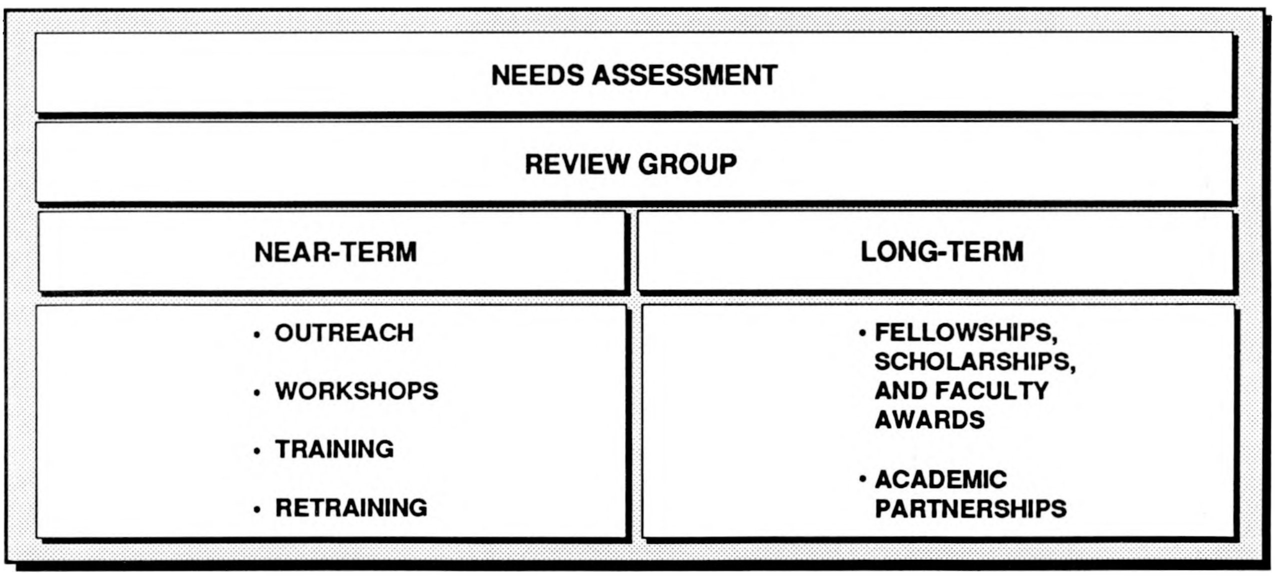


Figure 5.7.1. The Education Program is driven by evaluations of Department of Energy needs.

5.7.2 IMPLEMENTATION OF DOE/ACADEMIC PARTNERSHIPS: NEW PARTNERSHIPS AND PILOT CENTERS AT NEW MEXICO AND SOUTH CAROLINA

Widespread interest has been expressed throughout all regions of the United States in the potential benefits of academic partnerships with DOE modeled on the New Mexico/South Carolina Pilot Centers.

The efforts of the two pilot centers in the first half of FY 1990 have resulted in development of cooperative agreements between university and Federal partners that will allow implementation of the education initiatives outlined in the respective management plans. In addition to the pilot centers, DOE intends to form other partnerships as a means of developing human resources. A procurement action has been initiated to obtain proposals from academic institutions that are interested in forming Academic Partnerships.

The Academic Partnerships program is aimed at increasing the number of scientists, engineers, and other professionals, especially technicians, educated in relevant technical and nontechnical disciplines. The objectives are to infuse an Environmental Restoration/Waste Management focus into existing curricula and to increase the participation of minority and educationally disadvantaged students.

The program includes: faculty development; enhancement of interdisciplinary and multidisciplinary educational approaches; student recruitment and career counseling particularly with minority and educationally disadvantaged students; internships; linkages among middle schools, high schools, two-year academic institutions, and the private sector.

Partnerships will include two or more accredited two-year or four-year academic institutions and collaborative linkages with one or more DOE facilities. The partnerships will be funded on a cost-sharing basis, with plans for self-sufficiency within five years. The support of partnerships is intended to overcome the startup barriers associated with implementing new academic programs. Partnerships are intended to develop innovative methods and techniques for integrating the traditional technical disciplines and develop innovative programs to attract and develop minority student interest in technical careers.

The New Mexico Education Research Center for Waste Management is a consortium of three New Mexico universities operated by New Mexico State University. Other members of the consortium are the University of New Mexico and New Mexico Institute of Mining and Technology. A pilot center has been established to expand the national capability to address problems in both the public and private sectors associated with the management of radioactive, hazardous, and solid waste by providing educational and research programs designed to develop, transfer, and apply new technologies.

In the New Mexico pilot center, curricula modifications providing for Environmental Restoration/Waste Management emphasis courses in engineering and scientific degree disciplines have been implemented at the three participating institutions.

A strong program of research by graduate students in 27 specific Environmental Restoration/Waste Management research projects is being organized. Facilities provided by the universities are being utilized in the training of technologists in associate degree programs. A series of short courses, seminars, and educational programs leading to professional training certification in various waste management areas will be developed.

A program of interactive instructional television is being instituted that will enable students to enroll in offsite courses. The program will eventually include 25 to 30 courses each year.

The New Mexico pilot center will work to ensure that the actual needs of users of the resulting technologies and trained human resources are factored into the education and research activities of the consortium and that the results of these efforts are effectively communicated and utilized outside the consortium. Industrial participation will be included in the R&D planning phase and an Advisory Board and Industrial Liaison Program will be established.

The South Carolina Universities Research and Educational Foundation (SCUREF) is a consortium of universities that has established a pilot center for Education, Environmental Restoration/Waste Management Research and Development, and Outreach. SCUREF has a dual mission for Research and Development, and Education and Training.

A program already under way at SCUREF will serve as a pilot for testing of education and training for Environmental Restoration/Waste Management. Emphasis will be on encouraging the educationally disadvantaged in Environmental Restoration/Waste Management careers. Four-year colleges, particularly historically black colleges and universities (HBCUs), community colleges, and technical schools will be encouraged to participate. Initiatives are being developed with South Carolina State College, an HBCU, and the University of South Carolina-Aiken to create a varied program that incorporates changes in engineering degree curricula. These include concentrations in Environmental Restoration/Waste Management. Initiatives also include Associate Degree programs in Environmental Restoration/Waste Management at 16 additional technical schools.

Other initiatives include establishing a Technology Transfer Center, implementing a Distinguished Scientist Program to involve world-class scientists in Environmental Restoration/Waste Management problems and issues, establishing a User Facility for Demonstration of Effective Technologies, and establishing an Information Center to provide videotapes and instructional materials for the consortium.

The SCUREF consortium is also performing significant research in the areas of in situ remediation, waste minimization, closure standards, and advanced analytical measurement techniques for cost-effective characterization of contaminated site.

5.8 SUMMARY OF PLANNED OFFICE OF TECHNOLOGY DEVELOPMENT FUNDING AND MILESTONES, FY 1990-1996

Funding plans and milestones for the Office of Technology Development (OTD) Program represent a substantial resource investment by DOE and demonstrate a commitment to an ambitious, yet realistic, program of applied Research, Development, Demonstration, Testing, and Evaluation (RDDT&E) in support of Environmental Restoration and Waste Operations needs.

The OTD Program exists to support Environmental Restoration and Waste Operations actions and must be responsive to changing Environmental Restoration and Waste Operations needs.

Program Areas/Program Elements: Funding for six broad technology Program Areas has been established. Program Areas are further defined in terms of Program Elements.

- Environmental Restoration Program Elements: Interim Containment Methods, Remediation--In Situ and Other, and Decontamination and Decommissioning (D&D).
- Waste Operations Program Elements: Waste Minimization, Waste Treatment, and Waste Storage and Disposal.
- OTD Education and Outreach Program Elements: Educational Initiatives, Technology Transfer, and interface with non-DOE organizations.
- OTD Supporting Program Elements: Robotics, Characterization of Waste Sites and Disposal Systems, Analytical Methods and Support, Risk Management, Information Systems and Data Bases, and Innovative Technology.
- Program Support Development Elements: General administrative financial management and internal program support to OTD, including collaborative international efforts.
- Transportation Management Elements: Details are in Section 6.5. Attachment D describe problems facing DOE; a strategy for technology development to deal with these problems; and plans, activities, accomplishments, and budgets for each Program Element.

OTD Program Budget: For FY 1990 and FY 1991, budget levels shown in Figure 5.8 are approved or submitted by DOE; estimates for FY 1992 through FY 1996, budgets represent DOE commitment to invest at least 10 percent of the Environmental Restoration and Waste Management budget in technology development. All such amounts are considered to be validated. (See Section 1.2.)

OTD Program Goals and Milestones: The following goals and milestones are established for OTD:

FY 1990

- Identify and support RDDT&E for Environmental Restoration and Waste Operations that will reduce waste cost, and risk and ensure accomplishment of the 30-year cleanup goal.
- Initiate national team programs in waste minimization and robotics RDDT&E.

- Initiate pilot programs for DOE-university partnerships to further education in technical areas that support Environmental Restoration and Waste Operations.
- Initiate fellowship/scholarship programs to draw students into environmental careers.

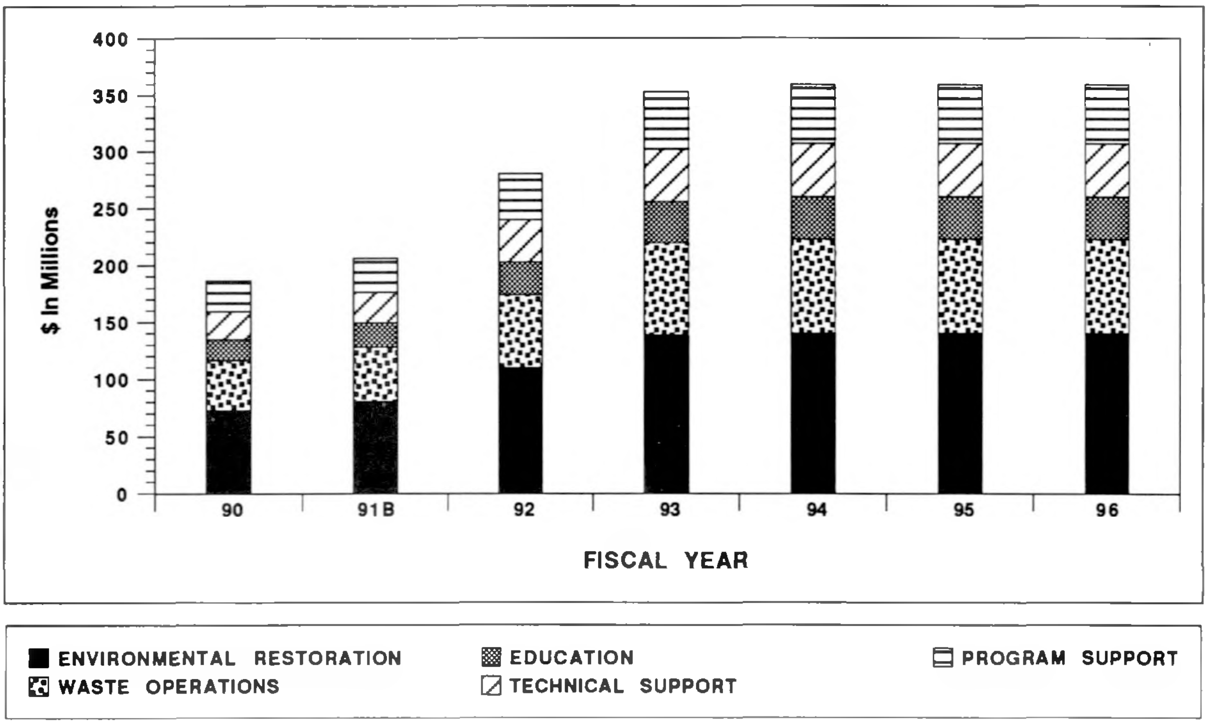
FY 1991

- Initiate and continue RDDT&E to develop technologies for nonintrusive characterization, innovative monitoring, and remote assay.
- Initiate and continue RDDT&E to develop technologies that will contain further migration of contaminants, achieve permanent isolation, and facilitate cleanup of soils and aquifers.
- Continue RDDT&E on technologies to minimize waste volumes and toxicity, eliminate hazardous process chemicals, and deliver innovative production methods.
- Support academic community initiatives to encourage youth in environmental careers and to involve minorities and disadvantaged.

FY 1992-1996

- Emerge as the international leader in technology development for environmental restoration and waste management.
- Change the DOE and national laboratory culture to foster significant cooperation and teaming on RDDT&E among the national laboratories, industry, and universities.
- Make significant contributions to the enhancement of education in science and technology and to the expansion of the talent pool for site cleanup and waste management.
- Significantly accelerate the development and deployment of the next generation of technologies needed by Environmental Restoration and 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.)**



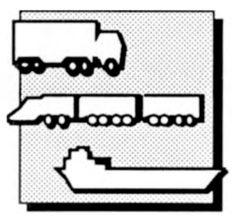
Fiscal Year (Millions of Dollars)

OFFICE	1990	1991B	1992	1993	1994	1995	1996
Environmental Restoration	73.0	80.7	109.8	138.3	140.6	140.6	140.6
Waste Operations	42.7	47.2	64.2	80.9	82.2	82.2	82.2
Education	19.2	21.2	28.9	36.3	37.0	37.0	37.0
Technical Support	24.3	26.9	36.6	46.1	46.9	46.9	46.9
Program Support	27.1	30.0	40.8	51.4	52.3	52.3	52.3
TOTAL	186.3	206.0	280.3	353.0	359.0	359.0	359.0

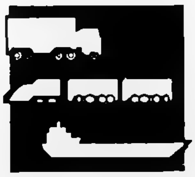
Figure 5.8. Office of Technology Development funding and estimated costs through FY 1996 represent a firm commitment by the Department of Energy to provide the technology to support Environmental Restoration and Waste Operations actions.

6.0

Transportation



6.1 SCOPE OF EXISTING TRANSPORTATION PROGRAM



An established and highly regulated infrastructure for safely transporting radioactive and other hazardous materials is in place--both within DOE and in the private sector.

DOE's Transportation Management Program in the Office of Environmental Restoration and Waste Management coordinates shipping of all DOE-owned materials except weapons and their components. DOE Headquarters develops the transportation policies and procedures implemented by Operations Offices throughout the country. Transportation Management Program functions are carried out in the areas of operations, technology development, and outreach.

To put DOE transportation in perspective, it is important to understand its place in U.S. transportation. Of the estimated 500 billion shipments of all types of materials made each year, DOE makes about 350,000, including some 30,000 of hazardous materials. Radioactive materials shipments are about one-half that number, of which about 2,000 are radioactive waste.

Radioactive and mixed waste shipments will increase significantly under the transportation requirements of DOE corrective activities and environmental restoration programs. Transport of defense transuranic waste to the Waste Isolation Pilot Plant in New Mexico will be a major shipping campaign in meeting national waste management goals. Planning for shipment of commercial spent fuel and high-level waste to the repository is managed by the DOE Office of Civilian Radioactive Waste Management but is closely coordinated with current transportation planning.

DOE's radioactive shipments attract much attention and generate public concern disproportionate to what the majority of scientific and technical communities estimate the actual risk to be. This situation exists in spite of more than 40 years of nearly eventless shipping, both in this country and abroad. In fact, the record shows no death or significant injury as a result of the radioactive nature of the cargo.

DOE believes several interrelated factors contribute to this demonstrated performance. First, transport of radioactive materials is subject to more stringent regulations than transport of any other hazardous material. Regulations cover design and manufacture of the transport package[1]; shipment identification, including labeling, marking, placarding, and shipment papers; package and vehicle inspections; and routing and

[1] In the transportation and waste management industries, there is a common distinction made between the terms "packaging" and "package." Technically speaking, "packaging" is a container used for transporting a hazardous or radioactive material, and "package" is a container plus its contents. In this document, "package" is used to refer to a container only, and it is used more generically to refer to both a container and its contents.

driver training for shipments with higher radioactive content.

A second factor that contributes to the demonstrated safe transportation of radioactive shipments is the attention paid to the design of transportation packages. The regulatory philosophy is to ensure safety through package design rather than to depend on procedures or human action. Before a package can be federally certified to transport any radioactive material, it must pass a series of tests simulating or reproducing potential conditions of transport. Packages for larger quantities of radioactive materials must be able to withstand severe accident conditions. To ensure that a package is constructed as designed, comprehensive quality assurance procedures are incorporated throughout all phases of engineering and fabrication.

To reinforce safe operations and regulatory compliance, DOE has an extensive training program for its transportation employees. One important training element is preparation for transportation emergencies. This program is available to State, Tribal, and local first-on-the-scene responders, such as police and fire departments.

While the existing transportation program is functioning well under today's conditions, the challenge to DOE is to modify and expand the entire system to meet the next generation of shipping requirements.

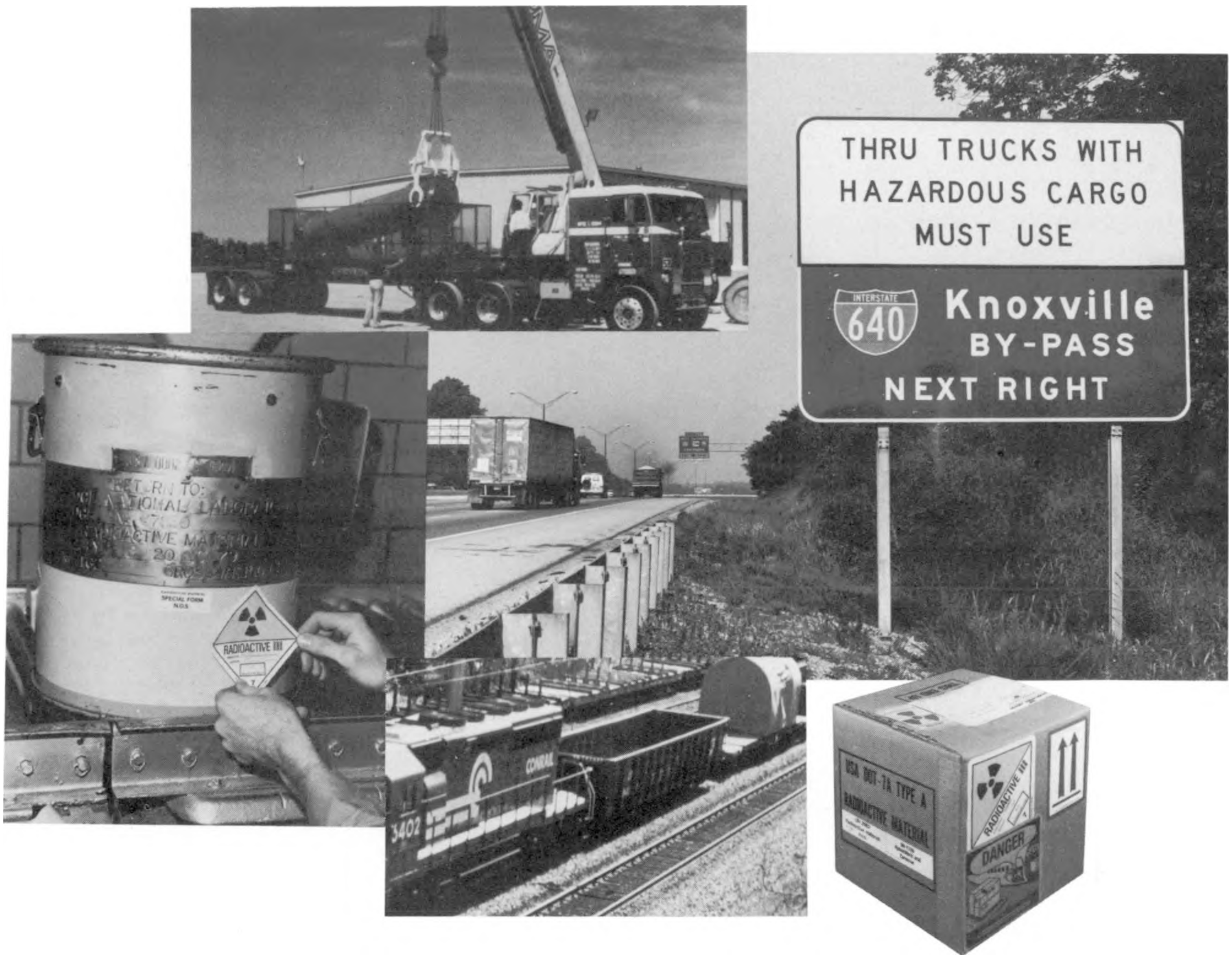


Figure 6.1. The Department of Energy Transportation Management Program incorporates a variety of interrelated activities.

6.1.1 GOAL, OBJECTIVES, AND STRATEGIES FOR ADAPTING THE TRANSPORTATION SYSTEM TO FUTURE NEEDS

The Transportation Management Program plans to conduct activities so that DOE's increasing transport requirements are met safely, efficiently, and in a publicly acceptable manner.

The Transportation Management Program is assessing the shipping requirements of the comprehensive Environmental Restoration and Waste Management Program to ensure appropriate transportation support will be available as needed. To meet this goal, two major objectives have been identified. First, the existing transportation infrastructure must be modified and expanded to accommodate the projected changes in shipping requirements. The second objective is to improve the political and public perception of DOE's capability to ship radioactive materials safely and effectively.

The Transportation Management Program recognizes that the strategy to achieve its goal must be aggressive enough to produce timely results but flexible enough to accommodate uncertainties. At this point in the planning process, there are numerous unknowns in the overall Environmental Restoration and Waste Management Program that could significantly affect transportation requirements. For example, the level of success achieved in developing the waste minimization technology will determine the number of waste packages needed as well as the number of shipments to be made.

An initial strategy element is the development of a comprehensive and integrated transportation needs assessment. While the scope of the need is admittedly variable, a number of requirements can already be identified. In the area of technology development, mixed waste will be a substantial component of the waste to be shipped; therefore, activities to design the appropriate packages can be undertaken in the near term. Alternatives to existing packaging materials will be examined for safety, efficiency, and cost advantages. New techniques, such as use of robotics in package handling operations, could reduce occupational radiation exposure, increase reliability, and reduce manpower requirements. DOE's package testing program will be evaluated to determine needed improvements in facilities and in the quality of data.

DOE also intends to scrutinize its operational procedures to determine the changes needed to meet the future cleanup and waste management requirements. Should DOE add to its manpower resources? Are there enough commercial carriers and trained drivers? Is DOE adequately prepared for any transportation emergencies? These are but a few of the operational questions that must be answered in a comprehensive, systems-integrated way. As preliminary steps, DOE is already streamlining and systemizing its shipping operations through automation and better integration of resources. In addition, training programs are being reevaluated for responsiveness to future needs.
The second planning objective--gaining

public understanding and acceptance of DOE's transportation activities--is a primary focus of the Transportation Management Program's Outreach effort. An ongoing strategy is the development of effective, objective information products. Although the transportation of radioactive materials has a long history of safe operation, many citizens continue to have concerns. Accordingly, special emphasis will be placed on improving capabilities in the area of risk communication.

DOE found the most effective strategy for reinforcing confidence is to foster public participation in program activities. The Transportation Management Program is introducing this approach through cooperative agreements with State, Tribal, and local governments. These joint efforts are providing opportunities for first-hand public review of DOE transportation operations and activities as well as of DOE documents. The resulting comments and recommendations have been and will continue to be an important impetus for change and improvement in operations.

In summary, DOE believes the most effective way of achieving a safe, efficient, and publicly acceptable transportation system is through soundly based technical and operational programs and an outreach effort founded on two-way communication and understanding.

6.2 SCOPE OF DOE WASTE TRANSPORTATION OPERATIONS

The Transportation Operations Programs set DOE policy and establish procedures for the safe and cost-effective transportation of materials and wastes.

The Transportation Management Program issues policy and program guidance through a system of orders and directives, which communicate requirements and procedures for conducting transportation operations. These orders specify operational policy based upon the review and analysis of applicable Federal, State, and local regulations and upon regulatory agency agreements. Operational procedures and facility information are communicated through a comprehensive Transportation Operations Manual and the DOE Transportation Facilities Guide.

The Transportation Management Program also supports the day-to-day operations needed to move materials and wastes safely and economically from their point of origin to their point of use, storage, or disposal. Activities involve classification and description of the material, proper package selection, marking, labeling, placarding, preparation of shipping documents, and other steps needed to prepare each shipment for transport. The program also supports the carrier qualification and selection process; freight rate and service contract negotiations; and the use of computer data bases to improve efficiency, reduce costs, track carrier performance, and document DOE shipment activities.

A comprehensive system is in place to ensure that DOE always ships waste using the right package and that each package complies with national and international standards and applicable regulations. Activities include the development of packaging procedures, use of packaging guides, review of package readiness, and determination of package system needs. This function also evaluates new package regulations proposed by regulatory agencies to determine the impact on current DOE packages and supporting activities.

Oversight programs monitor compliance with the package and transportation regulations by performing site appraisals and site reviews. The appraisal and review process ensures that each site has a formal packaging and transportation program in place to meet DOE standards. Appraisals focus on one or more of the following subject areas, depending on the scope of site operations: traffic and transportation management; hazardous material and hazardous waste packaging and transportation; and explosive classification activities, including their packaging and shipping.

Training courses are conducted nationwide for DOE and DOE contractor personnel, Federal agency staff, State and local officials, carrier employees, and others. Most of these courses focus on the regulatory requirements for safe packaging and transportation of hazardous materials and hazardous wastes. DOE also offers regional workshops on emergency preparedness and response. Special courses aimed at modal (e.g., rail, air, water, truck) transport requirements and compliance with DOE Orders are also offered. Many of DOE's compliance courses are now available as interactive computer programs.

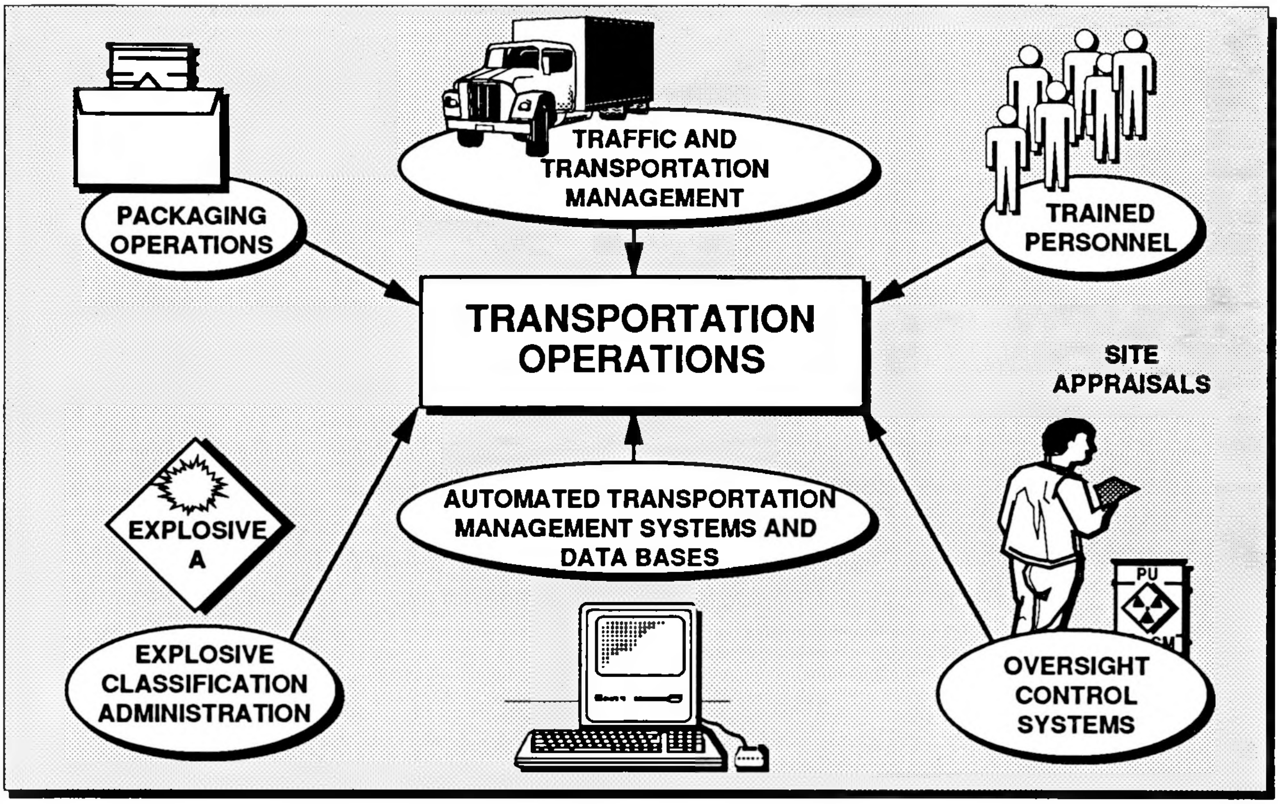


Figure 6.2. The Transportation Operations Program includes many activities that support the safe and economical transportation of Department of Energy materials and wastes.

6.2.1 PLANS FOR IMPROVING TRANSPORTATION OPERATIONS

DOE will continue to improve its transportation operations as experience and new technology advance.

Three major initiatives are planned to improve transportation operations in the 1990s.

Expanded Training Programs: Providing adequate training for packaging and transportation personnel is an ongoing challenge. Meeting this challenge is vital to ensuring safety and regulatory compliance for DOE waste shipments. Initial and repeat training programs must be designed for many different target audiences to ensure that DOE and its varied contractor staffs have expert knowledge of the requirements and procedures mandated under State and Federal legislation.

Several years ago, DOE started a program to regularly evaluate its transportation training needs and to develop programs to meet these needs. As a result, a variety of training programs were introduced by DOE's site operating contractors. In addition, the Transportation Management Program started a number of transportation safety and compliance training courses to ensure uniform understanding and application of the regulations. Twelve of these unique training programs are currently available, and several more are in the development stages to meet expanded training requirements being proposed by other Federal agencies. Some DOE training--notably for emergency preparedness--is available to individuals and groups external to the Department, including State and local emergency responders and planners as well as industry personnel.

Carrier-Shipper Partnerships: DOE emphasizes building strong safety and compliance partnerships with the commercial carriers hauling materials and wastes. To build such a partnership, DOE ensures that only highly qualified carriers are selected for providing services. Deregulation of the transportation industry has made this a critical issue. Many new carriers want DOE's waste transport business, and some carriers used in the past are no longer operating.

DOE now has a formal nationwide carrier evaluation and selection program. This program sets detailed criteria and standards for grading prospective carriers. The evaluation criteria encompass critical areas, such as equipment condition and maintenance, driver qualification and training, years of experience, carrier and driver accident record, and management's commitment to safety. The carrier evaluation program is a management tool for transportation professionals at each DOE facility to use in ensuring that only highly qualified carriers transport DOE materials.

This program is now concentrating on carriers of Highway Route-Controlled Quantity radioactive shipments (e.g., spent fuel and defense high-level waste), but expanded activity will also address hazardous waste haulers and truckload quantity carriers of radioactive wastes.

Automation: Technological advances in logistics management have provided DOE with opportunities to improve operational efficiencies and, at the same time, improve safety through better communications. The computer and developing Electronic Data Interchange technologies will enable DOE to automate many of the information exchanges needed to support future transportation operations. Training, shipment routing and scheduling, equipment maintenance tracking, document preparation, satellite monitoring of selected shipments, and execution of nearly all carrier-shipper financial transactions can be automated. The Transportation Management Program has started a program to establish an "Automated Transportation Management System" within DOE. This program will coordinate and facilitate Departmental efforts in the development and application of Electronic Data Interchange technology to ensure the compatibility of all DOE operations nationwide. Technology studies and applications have begun at several different sites.

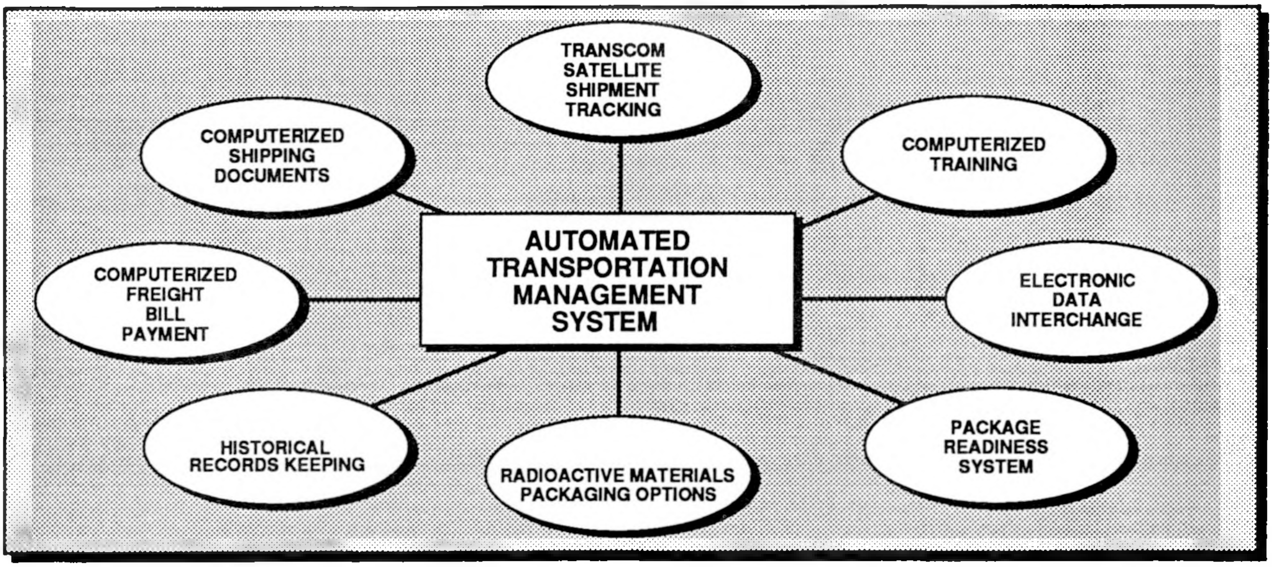


Figure 6.2.1. The Department of Energy Automated Transportation Management System Program will reduce transportation costs and simplify data collection.

6.2.2 COORDINATION OF EMERGENCY RESPONSE PLANNING

The Transportation Management Program is introducing measures to reinforce confidence that transportation accidents can be responded to effectively through coordinated Federal, State, Tribal, and local preparedness.

For over 40 years, DOE and its predecessor agencies have been shipping radioactive materials in the United States. The transportation of these materials, including wastes, has achieved an exemplary safety record. DOE recognizes, however, that accidents will occur and is taking steps to improve the capability for coordinated response.

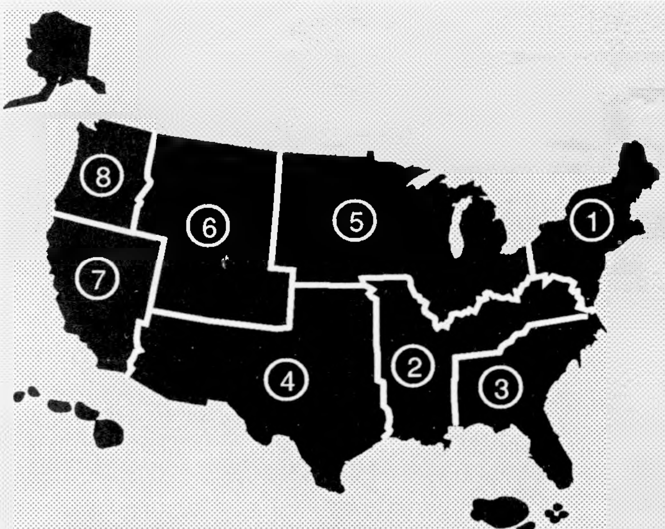
If a transportation accident involving hazardous materials occurs, responsibility for first response lies with State and local officials. However, a comprehensive program of Federal backup response is available upon request.

The Federal Radiological Response Plan assigns DOE the task of providing monitoring and assessment assistance if radioactive material is involved in an accident. To fulfill this responsibility, DOE has an active emergency response program involving Regional Coordinating Offices located in eight geographical regions across the United States. These Regional offices, with the support of DOE contractors, are capable of responding to both transportation and fixed-site radiological emergencies. The response may be as simple as providing needed information over the telephone. If more extensive assistance is needed, specialized personnel and equipment can be mobilized quickly and sent to the accident scene.

Over the past several years, the public has become increasingly aware of radioactive materials shipments passing through their neighborhoods. Citizens want--and deserve--assurances that if an accident happens, they will be protected. The Transportation Management Program has taken a number of steps to address these concerns. For several years, emergency preparedness training has been offered not only to DOE and contractor employees but also to State and local emergency officials. This training provides first responders with the understanding of the shipping requirements for hazardous materials, as well as basic principles of radiation, instrument use, and exposure and contamination control techniques. The scope of the Federal emergency response system and the role and resources of DOE are described in a 1989 document entitled <u>Emergency Preparedness for Transportation Incidents Involving Radioactive Materials</u> (SAIC-89/1354).

The Transportation Management Program has recently been assigned a full-time emergency preparedness coordinator. The duties of this coordinator are to ensure DOE meets its emergency preparedness responsibilities as an integrated element of the overall national transportation emergency response system. The goal is to instill public and institutional confidence in the system's ability to properly respond to any radioactive or other hazardous material transportation accident.

DOE's efforts to coordinate its internal emergency response capabilities are complemented by its cooperative activities to address emergency preparedness issues with external groups. For example, DOE is finalizing a Cooperative Agreement with the Western Governors' Association under which emergency preparedness for Waste Isolation Pilot Plant shipments is a primary issue to be addressed. Similar arrangements are being initiated with the Southern States Energy Board and with Indian Tribal governments. In addition, a major focus of a DOE cooperative arrangement for exchange of information with urban officials is improvement of emergency response policies and procedures. These interactive relationships are the building blocks for a well-coordinated national system for response to transportation emergencies in which Federal, Tribal, State, and local roles are well defined and mutually supportive.



(1) BROOKHAVEN AREA OFFICE
UPTON, L.I., N.Y. 11973 (516) 282-2200

(2) OAK RIDGE OPERATIONS OFFICE
P.O. BOX 2001, OAK RIDGE, TN 37831
(615) 576-1005 or (615) 525-7885

(3) SAVANNAH RIVER OPERATIONS OFFICE
P.O. BOX A, AIKEN,SC 29808
(803) 725-3333

(4) ALBUQUERQUE OPERATIONS OFFICE
P.O. BOX 5400, ALBUQUERQUE, NM 87115
(505) 844-4667

(5) CHICAGO OPERATIONS AND REGIONAL OFFICE
9800 S. CASS AVE., ARGONNE, IL 60439
(312) 972-4800 , OFF DUTY HRS. (312) 972-5731

(6) IDAHO OPERATIONS OFFICE
785 DOE PLACE, IDAHO FALLS, ID 83402
(208) 526-1515

(7) SAN FRANCISCO OPERATIONS OFFICE
1333 BROADWAY, OAKLAND, CA 94612
(415) 273-4237

(8) RICHLAND OPERATIONS OFFICE
P.O. BOX 550, RICHLAND,WA 99352
(509) 373-3800

Figure 6.2.2. Department of Energy Regional Coordinating Centers for Emergency Response provide assistance to State and local authorities nationwide.

6.3 SCOPE OF TRANSPORTATION TECHNOLOGY DEVELOPMENT PROGRAM

The Transportation Technology Development Program anticipates future packaging and transportation system needs, identifies potential problems, and develops innovative solutions for DOE transportation activities.

The Transportation Technology Development Program is designed to improve and develop new transportation and packaging system designs to meet Department needs. The program, which remains flexible to accommodate new technical data and changing requirements, consists of two generally interactive areas: base technology, which is not project specific but oriented toward new technologies to solve current and future problems, and project-specific technology, oriented toward specific project packaging needs and the supporting requirements for their development.

The Transportation Technology Development Program consists of seven activity areas:

1. ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT PACKAGE DEVELOPMENT: New package development begins with an assessment of needs to transport materials from Environmental Restoration and Waste Management activities. Technology activities required to support the package development will then be evaluated. New technology may be required to support hazardous and mixed-waste shipments.

2. ENGINEERING ANALYSIS: Computer analysis codes help predict the behavior of packages under transport conditions. Regulatory acceptance of these codes is based on well-established engineering practices. Computer codes are time- and cost-effective alternatives to expensive and often impractical full-scale testing. Many types of computer codes are used in analyzing packages, including structural, thermal, criticality, and shielding codes. Methods for evaluating source term (amount of radioactivity in a cask that can be released) and containment and for optimizing package designs are being developed.

3. TESTING: Scale models, component sections, and full-scale packages are tested at DOE facilities to verify that the design will perform as required and to compare the results of computer analysis with actual testing. Activities will focus on improving the quality of data and facility capabilities and on obtaining a better understanding of package response and transport conditions. Testing of the TRUPACT II package has been a critical activity to support the opening of the Waste Isolation Pilot Plant.

4. ADVANCED TECHNOLOGY DEVELOPMENT: New system concepts, components, and materials developed under this activity are used and applied by package developers DOE-wide. Materials being considered as alternatives to stainless steel for structural use are ferritic steel and ductile cast iron. DOE is

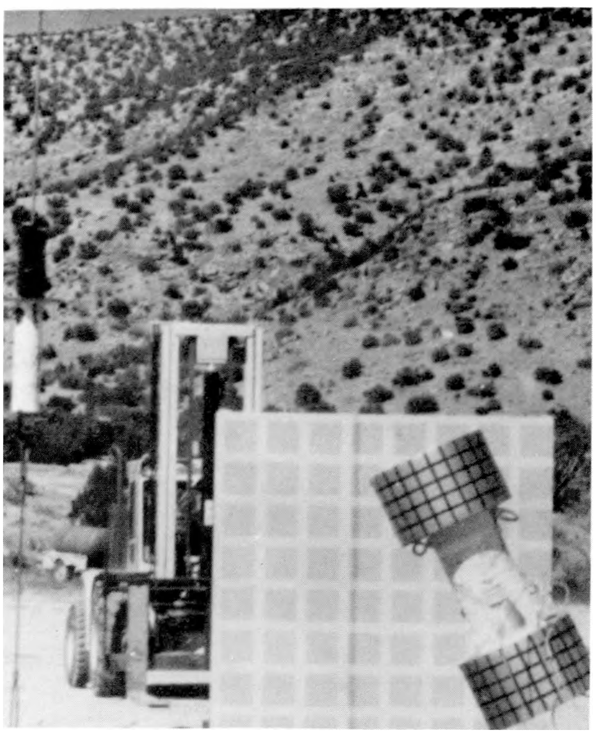
investigating advanced robotics equipment for package handling operations that may significantly reduce occupational radiation exposure, increase reliability, and reduce manpower requirements.

5. CERTIFICATION SUPPORT: Packages used for higher levels of radioactive materials must be certified to meet the design requirements. To ensure timely certification of DOE packages, this activity provides for continuous development and maintenance of capabilities and skills for state-of-the-art technical evaluations. Recent work has been directed toward developing the supporting analysis needed for certification of the TRUPACT II and the Defense High-Level Waste cask.

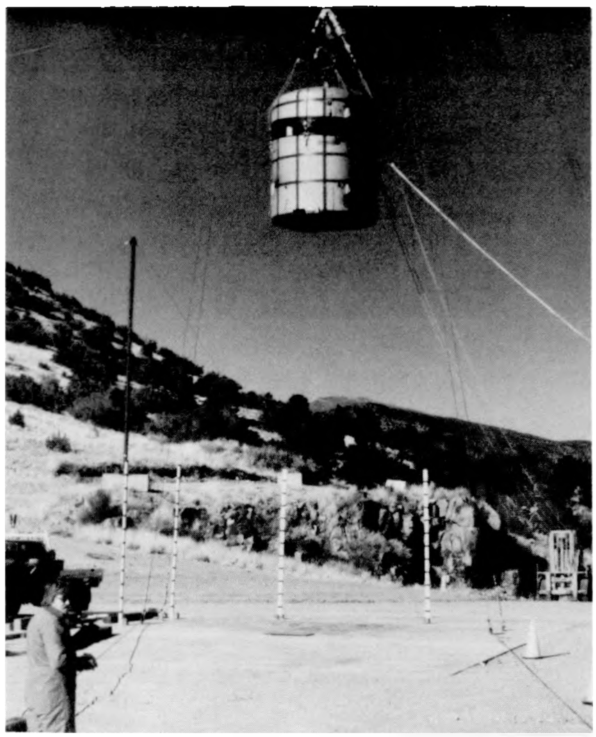
6. REGULATORY SUPPORT, STANDARDS DEVELOPMENT, AND TECHNOLOGY TRANSFER: This activity addresses major technical issues of significant concern to regulators. In addition, the program supports U.S. and international standards organizations by developing technical data and by providing comments on proposed regulations and standards.

7. SAFETY AND SYSTEMS ASSESSMENT: Analyses of transportation systems include radiological risk, logistic, and economic considerations as they affect and are affected by operational parameters and tradeoffs; facility interfaces; and environmental, social, and institutional forces. This program develops and revises computer models with the most up-to-date information to assist in these evaluations. Through the development of an interactive computer network called TRANSNET, other users, such as State agencies and industry groups, can access the transportation models.

These seven activity areas are categorized and described in detail in Sections 6.3.1 through 6.3.3.



TMI-125B Scale Model Cask



TRUPACT II

Figure 6.3. The Transportation Technology Development Program supports certification testing of Department of Energy transportation packages.

6.3.1 PROCESS OF DEVELOPING PACKAGES TO SUPPORT ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT ACTIVITIES

Developing new packages requires assessing Office of Environmental Restoration and Waste Management (EM) program needs; resolving payload, transport, and safety issues; conducting engineering analyses; applying developed technologies to new designs; and preparing safety analysis reports for package certification by regulatory agencies.

For sites where in situ remediation is not possible, the transport of wastes to processing, storage, or permanent disposal sites will be required. Packages for the transport of waste samples to laboratories may also be needed to facilitate analysis for support of remedial actions.

The purpose of this activity is to develop the technology to support EM transportation package requirements. Technical issues include (1) characterizing waste for containment analysis and package safety for diverse multiple contaminants; (2) identifying applicable regulations and package design requirements and developing guides and standards; (3) assessing existing analytical methods and developing and validating new analytical tools for designing and assessing the performance of packages containing single or complex mixtures of radionuclides, heavy metals, organic compounds, and biological contaminants; (4) identifying remediation, decontamination, and decommissioning technical issues resolvable by available packaging technology and transfer of technology; (5) increasing the integration of future package designs based on interface assessments with other EM activities; and (6) introducing quality assurance procedures to ensure all development phases meet high levels of safety and efficiency.

In developing new packages for EM, designers must assess and, if needed, find new engineering analysis methods. Current methods for evaluating radioactive material packages may not work for hazardous and mixed waste packages.

Package development must be done in close cooperation with people responsible for EM programs. Package developers must carefully consider how volume reduction, waste minimization, and treatment methods affect design. Quality assurance will be an important part of all development work.

The final phase of the development process is to transfer the new technology to new package designs.

Transport packages containing large quantities of radioactive materials (Type B) are transported in accordance with the requirements of the Department of Transportation 49 CFR and certified in accordance with Nuclear Regulatory Commission (NRC) requirements specified in 10 CFR 71. DOE has the authority to certify that its own packages for shipments of large quantities of radioactive material are equivalent in design to the NRC standards. This DOE self-certification authority has been used to certify many of these packages, and the authority is still being used by DOE.

In recent years, however, DOE has made policy decisions to have certain radioactive waste shipments (i.e., to the Waste

Isolation Pilot Plant and to Three-Mile Island) made in packages certified by the NRC. For future shipments of civilian radioactive waste under Nuclear Waste Policy Act amendments, Congress has decreed that these shipments must be done in NRC-certified packages. DOE will evaluate the need for NRC certification for packages shipped under the Environmental Restoration and Waste Management Program.

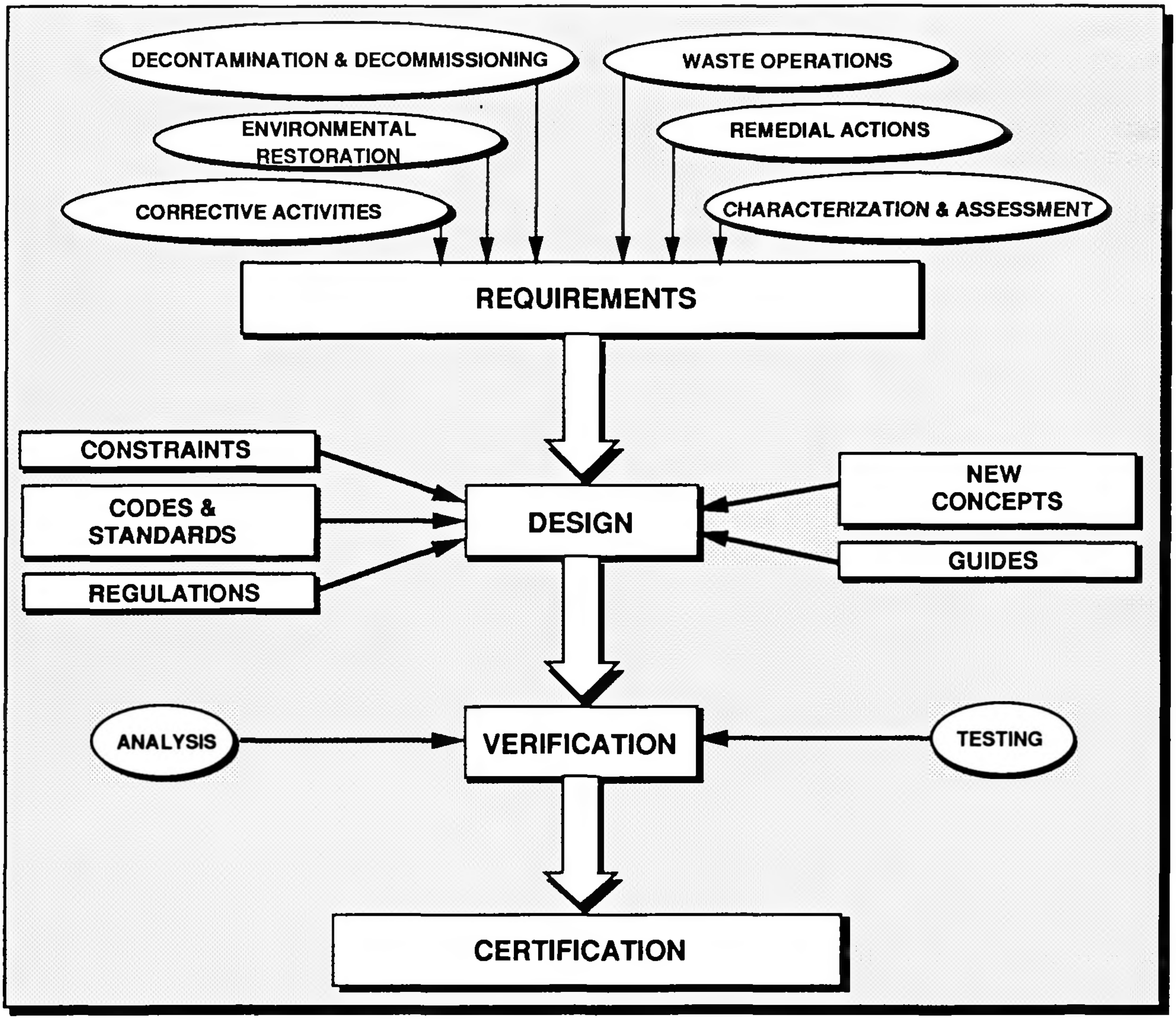


Figure 6.3.1. The process of developing new packages reflects a systematic and integrated approach.

6.3.2 ELEMENTS IN ENSURING THE SAFETY OF PACKAGE DESIGN

Advanced methods and technologies for analyzing and testing packages and components will ensure the availability of a wide range of packages meeting strict Federal regulations.

The objective of the engineering analysis program is to provide state-of-the-art computer analysis tools for package development programs. Before a package design can be approved for use (certified), a Safety Analysis Report for Packaging (SARP) must be prepared showing how the package meets regulations. This is done by actual testing or engineering analysis.

Safety requirements that must be proven in a SARP include the package design's structural, thermal, shielding, criticality, and containment capabilities. Engineering analysis is an acceptable alternative to full-scale testing.

Package Analysis:

- Structural--Modeling techniques accurately predict that the materials and design characteristics of the package will perform as planned. DOE has, for many years, assisted in developing structural computer analysis codes for package design and evaluation.
- Thermal--DOE has been a leader in the development of thermal analysis codes to predict how a package will perform during normal transport and in accident situations where a fire occurs. Development work focuses on two current needs: (1) methods to evaluate heat transfer within a package cavity of a spent fuel cask while in transport and (2) methods to predict the performance of combustible materials in the package used for impact limiters and shielding.
- Shielding and Criticality--Packages must protect people from radiation. They must also prevent a nuclear chain reaction (criticality). Computer tools for such analyses are well developed and will be continually improved.
- Containment--Packages carrying large quantities of radioactive materials are required by regulation to contain their contents under normal transportation and under accident conditions. DOE is developing a model to predict the amount of material, if any, that can escape from a container under accident conditions.

Package Testing: Small-scale and full-scale models of packages or components can be tested to show their response to accident conditions. Federal regulations are very strict about what tests must be done. DOE maintains state-of-the-art testing facilities to conduct these tests. Testing confirms engineering or computer methods and shows how packages respond to accidents. DOE develops state-of-the-art test methods and improved instrumentation to get accurate and repeatable data. DOE also conducts applied research to characterize normal and accident transport conditions and to better understand how packages perform in severe accident situations.

Package Development: In the United States, spent nuclear fuel shipping casks have usually been made of stainless steel. Potential new cask materials, such as common steels and ductile cast iron, have properties differing from stainless steel.

Activities are under way to better characterize materials for radioactive materials packages.

The development of new packaging concepts can improve package safety and reduce costs. New materials and designs can lead to a new generation of cost-effective, certifiable packages.

Casks and their handling equipment will be designed for remote operations. DOE will also develop the technology and equipment for handling these packages remotely.

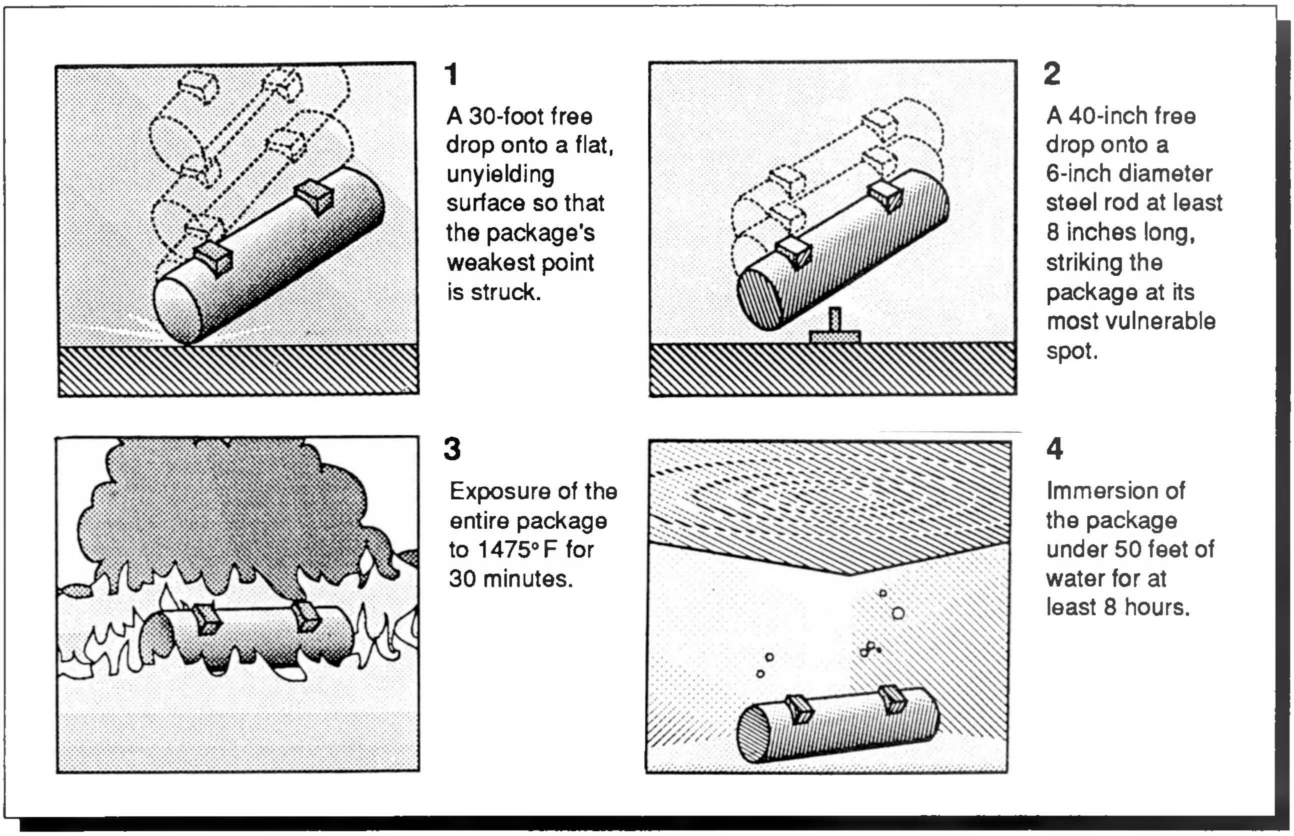


Figure 6.3.2. Tests of packages containing large quantities of radioactive materials (Type B packages) show that the packages can withstand normal and severe accident conditions.

6.3.3 ENSURING THE REGULATORY ACCEPTANCE OF PACKAGES AND THEIR SYSTEMWIDE USE THROUGH COMPUTER CODES

Well-developed risk assessment and systems analysis methods and computer codes can accurately predict the safety impacts of a variety of transportation activities.

Risk Assessment: All aspects of the Nation's nuclear waste programs--including regulations, procedures, design and test programs, and cask safety--are under scrutiny by many interested parties. To respond credibly to these interests, risk analysis and risk assessments must be as accurate and representative as possible. Data bases and supporting computer codes are continually developed and updated to make the task easier.

Risk analysis uses analytical methods to assess the radiological and nonradiological risks of transporting radioactive materials. DOE's principal risk analysis tool is the RADTRAN computer program. This program was developed to support the analysis required for the generic transportation environmental impact statement prepared for the U.S. Nuclear Regulatory Commission, NUREG-0170, Final Environmental Statement on the Transportation of Radioactive Material by Air and Other Modes.

TRANSNET is an interactive computer network permitting access to the most recent versions of transportation analysis models, such as RADTRAN, and their associated data bases. TRANSNET is available to States, communities, Tribes, private industry, universities, and anyone else with a noncommercial need for such models (Figure 6.3.3).

Systems Analysis: Systems analysis evaluates transportation operations and packages by simulation. Operational, physical, and routing options can be evaluated before commitments are made for specific mode of operation or design. The impacts of legal and physical changes on the transportation network, as well as on the package, can be investigated. These analyses provide cost and routing options.

Coupled with risk analysis models, systems analyses assess the environmental impacts of nuclear waste transportation. The safety and systems assessment activity supports DOE's obligation for meeting the requirements of the National Environmental Policy Act (NEPA) and the Council of Environmental Quality regulations.

Regulatory Support and Standards Development: DOE participates in the national and international regulatory process. Interaction with regulatory agencies consists of developing technical data and providing comments on proposed regulations and technical evaluations. Participation in these activities ensures that DOE has the most up-to-date regulatory requirements.

Participation in national consensus organizations (e.g., the American National Standards Institute and International Standards Organization) is important to the design and certification of hazardous material transportation systems. Technical input is provided to these groups to assist in the formation of new standards.

Technology Transfer: Technology transfer is accomplished through distributing publications, conducting special workshops on transportation and packaging issues, and providing public access to TRANSNET. Bilateral agreements with foreign countries and participation in national technical meetings and international symposia, such as the Packaging and Transportation of Radioactive Materials, are also avenues for transferring technology.

TRANSNET USER SUMMARY

STATE/TRIBAL REPRESENTATIVES

Arizona
California
Colorado
Illinois
Maryland
Nevada
New Mexico
North Carolina
Oregon
Pennsylvania
Tennessee
Texas
Virginia
Washington
National Conference of State Legislatures
Nez Perce Tribe and Confederated Tribes of the Umatilla Reservation
Southern States Energy Board
Western Interstate Energy Board

DOE/DOE CONTRACTORS

Office of Environmental Restoration and Waste Management and Area Offices
Office of Defense Programs and Area Offices
Office of Civilian Radioactive Waste Management and Area Offices
Office of Energy Research
Office of General Counsel
Office of Nuclear Energy

OTHER U.S. GOVERNMENT AGENCIES/CONTRACTORS

Department of Transportation
Federal Emergency Management Agency, Region X
Nuclear Regulatory Commission

OTHER ORGANIZATIONS

Canada: Atomic Energy Board
Environmental Policy Institute
GPU Nuclear Corporation
Fort St.Vrain Reactor
New Mexico Environmental Evaluation Group
NUEXCO
Radioactive Waste Management Associates
Research Triangle Institute
Rockwell International
Sierra Club Legal Defense Fund
University of New Mexico

Figure 6.3.3. TRANSNET is a nationwide computer network serving many users.

6.4 SCOPE OF TRANSPORTATION OUTREACH ACTIVITIES

Open dialogue with the public will be the cornerstone of the Transportation Outreach Program.

DOE recognizes its responsibilities to provide the public with information describing its transportation activities and to address issues of public concern. A program--the Transportation Outreach Program--for developing informational materials, tools, and activities is in place. DOE also recognizes the need to understand the varied perspectives of the public and to solicit public input as part of the Department's transportation planning and decision making. The Secretary of Energy has pledged a "new culture" at DOE. This new culture will include addressing problems and issues with new tools and attitudes and interacting with the public in an "open, forthright, consultative process."

The Transportation Outreach Program has two elements.

Institutional Interaction: The Institutional Program fosters interface and liaison with interested parties in all levels of Government and with other agencies as well as the identification and resolution of issues. Several initiatives designed to foster program participation by external transportation-affected groups are under way. In 1987, DOE entered into a Cooperative Agreement with the Energy Task Force of the Urban Consortium to facilitate interactions with officials from large cities throughout the country. In a series of workshops, the Task Force (recently renamed the Urban Energy and Transportation Corporation) brought together transportation authorities, fire and police officials, and emergency planners from local governments to exchange concerns, information, and recommendations on DOE transportation programs. These exchanges between DOE and city officials have identified urban concerns, substantially increased mutual understanding, and provided sound recommendations to be incorporated into current programs. Competitive procurement activities are under way to continue this initiative for at least the next five years.

A second institutional initiative is the planned cooperative effort with State and Tribal governments along the routes from DOE facilities to the Waste Isolation Pilot Plant in New Mexico. (See Section 6.4.1 for a detailed description.) In addition, DOE will continue dialogue with interested groups by participating in national and international conferences and other transportation forums and meetings.

Information and Communication: The Information Program provides products and activities to do several things: to help the public understand why and how DOE packages and transports its materials, particularly radioactive materials; to provide the tools to support DOE and others in responding to transportation-related inquiries and concerns; and to support DOE's training programs. Information products include printed material, films, exhibits, and models. Public information activities include workshops, video courses, and presentations. Emphasis will be placed on reaching new audiences in more effective ways. Innovative tools and activities will be developed for responding to needs identified through increased interactions and for describing new program developments. A future activity will include a mobile public orientation program that will incorporate presentation and audience discussion opportunities with displays and information materials.

DOE encourages public understanding and participation in its transportation programs through the combination of sharply focused, innovative informational materials and increased opportunities for the public to voice its concerns.

A more detailed discussion of programs and plans will be included in the Transportation Management Outreach Plan currently under development. This document, which should be available in the fall of 1990, will discuss why and how transportation outreach is conducted.

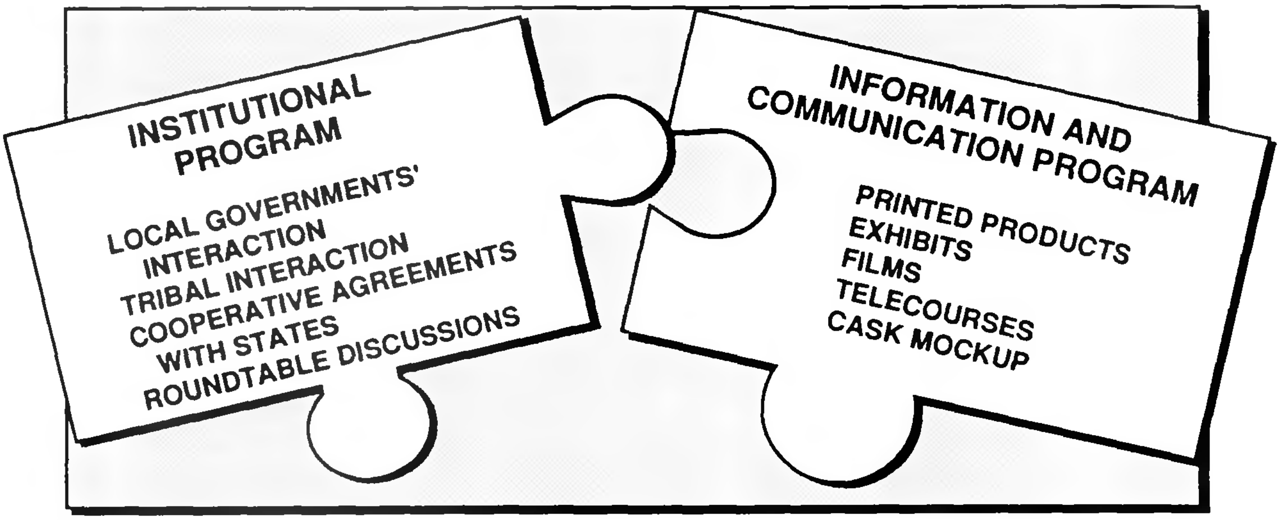


Figure 6.4. The Transportation Outreach Program has two elements that help coordinate activities to facilitate more productive interactions and provide appropriate information.

6.4.1 COOPERATIVE EFFORTS ALONG WASTE ISOLATION PILOT PLANT SHIPPING ROUTES

Preparation and planning for shipments to the Waste Isolation Pilot Plant (WIPP) include cooperative interaction with affected States, Indian Nations, and local communities.

DOE shipments of radioactive waste will increase substantially as a result of the WIPP Project to demonstrate disposal of transuranic waste from the Nation's defense activities. Waste will be transferred from ten DOE facilities to the WIPP Facility near Carlsbad, New Mexico. Figure 6.4.1 depicts DOE originating facilities and the potential routes to be used.

DOE recognizes the public's interest in WIPP. The number of shipments to WIPP creates a need for the involvement of jurisdictions (States and Indian Nations) along the shipping routes. Efforts to inform States and Tribes of projected activity already include an awareness program conducted by the WIPP Project Office. Under DOE's States Training and Education Program, training courses have been provided to State, Tribal, and local officials to reinforce existing emergency preparedness programs.

To extend involvement, DOE is entering into cooperative agreements to support WIPP transportation activities by the corridor States and Tribes. DOE's goals for these interactions are to (1) strengthen State and Tribal capabilities in areas where they have public safety responsibilities and (2) increase public understanding of transportation activities and the significant safety measures being taken to ensure very low risk.

Two principles will be followed in all the contractual arrangements:

- State and Tribal activity must be directly related to the transport of waste to the WIPP Facility.
- Initiation of each activity phase and the level of funding will be linked to the schedule of shipments to WIPP.

Current planning is for shipments during the first five years of WIPP operation to originate at DOE facilities in the western region. In June 1989, the Western Governors' Association (WGA) released a report to the Congress outlining recommendations for cooperative work between the Federal Government and western States along the route of DOE shipments to WIPP. The report identified three major areas of concern (accident prevention, emergency preparedness, and public information) as the appropriate focus for early cooperative activity.

The report and initial activities to address the States' concerns are the products of a FY 1989 cooperative arrangement between WGA and the Federal Highway Administration of the Department of Transportation (DOT). Transfer of Federal participation and funding from DOT to DOE was recommended in the report because DOE, as shipper of the transuranic waste, has primary responsibility for ensuring safe, effective transportation to the WIPP Facility.

DOE is now finalizing a cooperative agreement with WGA.

For those Indian Nations in the western region whose reservations will be crossed by waste shipments to WIPP, DOE has entered into discussions with Tribal governments to determine additional appropriate Tribal activities to be funded by DOE.

Shipments of waste from DOE facilities in the southeastern and central parts of the country are not scheduled to begin until five years after the start of WIPP operations. Nevertheless, DOE has initiated the procurement process to establish a cooperative agreement with the Southern States Energy Board to administer funding to the Southern States for transportation-related activities. A cooperative arrangement can likely be in place by this fall. Following a clearer definition of when the test phase of WIPP operations will begin, DOE will also contact a representative Tribal organization in Oklahoma to discuss a potential contractual arrangement.

These agreements, which will be funded and managed by the WIPP Project Office, will provide instruments for cooperative intergovernmental resolution of issues related to WIPP transportation.

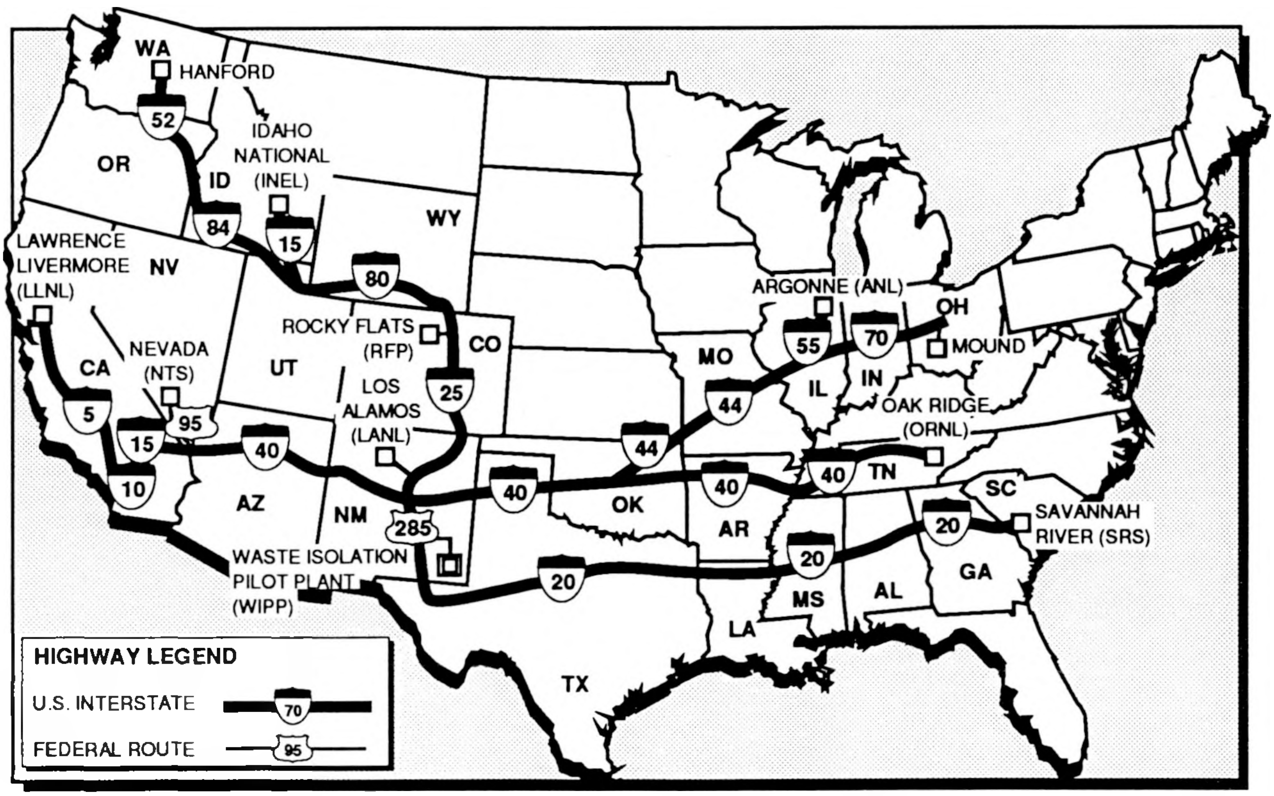


Figure 6.4.1. This figure shows proposed transuranic waste truck transportation routes to the Waste Isolation Pilot Plant (WIPP). Under Department of Transportation (DOT) regulations, the carrier of waste to WIPP must use routes that consist of (1) an Interstate Highway or (2) alternate routes selected by State agencies using DOT guidelines. Some of the corridor States are currently in the route review and designation process.

6.5 PLANS AND FUNDING FOR FY 1990-1996

Continuation of the Department's 40-year record of safe, efficient transportation will require an effective balance of well-run operations, new technology, and aggressive outreach.

As DOE's responsibilities change to meet the new challenges ahead, a sound, innovative transportation program must be in place to support program needs. This will be accomplished through development of continued and new activities and programs designed to ensure strict compliance with regulations; the development and maintenance of innovative radioactive and other hazardous materials packages; adherence to operating practices and procedures for the most efficient, economical, and safe transportation of DOE materials; and development of an outreach program for soliciting institutional and public input on concerns. To respond to existing and upcoming needs, future activities will focus on the following:

<u>Improving current operational efficiency</u> through the development of new data systems designed to prepare and process shipping documents. These data systems will be integrated with existing procurement, accounting, and transportation data bases through the Automated Transportation Management System to provide a cradle-to-grave and historical record of DOE shipment activity. Other activities will include improvements in carrier evaluation and selection, maintenance and use of packages, and the development of systems and procedures to meet new regulatory and program requirements.

<u>Expanding training of transportation handlers, shippers, carriers</u>, and others associated with DOE transportation, including State, local, and Tribal government representatives. Additional types and numbers of courses will be added to cover the complete spectrum of training requirements and to reach as many people as possible. A program to ensure systemwide consistency in course curricula, delivery, and testing on the subjects of handling, packaging, and transportation of hazardous materials will be developed and implemented.

<u>Developing improved package and transportation systems designs</u>, including a program to assess needs and requirements for hazardous materials and mixed waste packages in support of environmental cleanup activities. Effort will also be expended on developing automated package handling methods through robotics to reduce radiation exposure, increase quality and speed of operation, and reduce manpower requirements.

<u>Placing increased emphasis on a more aggressive outreach program</u> to foster an interchange of perspectives with those institutional and individual representatives interested in, or affected by, transportation activities. A major activity will involve working with State, Tribal, and local governments. Informational materials such as brochures, exhibits, and films will be incorporated in educational and informational activities and packages for specific audiences and uses.

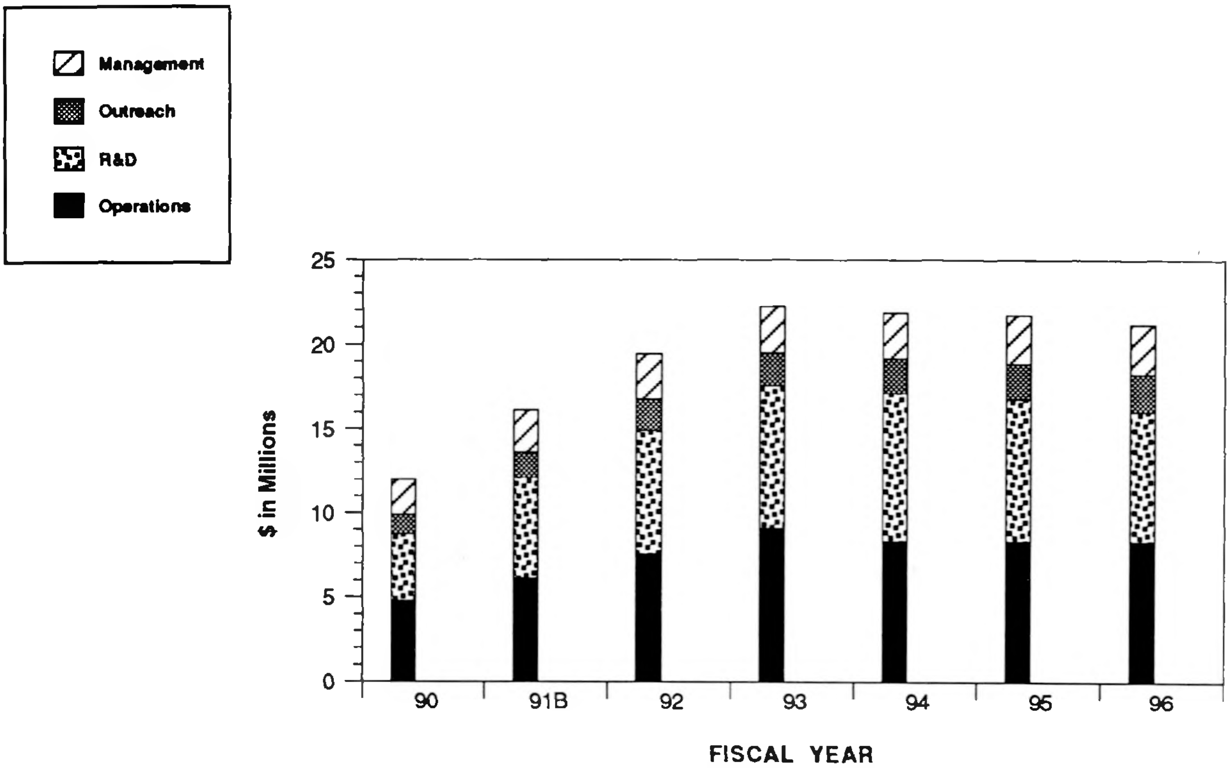
Implementing a formal, comprehensive transportation emergency preparedness program coordinated with DOE site emergency response activities, as well as with Federal, State, and local emergency management functions. Future activities include (1) establishing more formal criteria against which training for responding to a transportation incident must be measured and (2) expanding the current emergency response orientation workshops. The expanded workshops will include an emergency response training and qualification program for DOE and DOE contractor personnel, including highly specialized program training and exercises. In addition, the number of courses offered to State, local, and Tribal governments, carriers, and other appropriate participants will be increased.

Analyzing the need for additional National Environmental Policy Act documentation to support DOE's radioactive material transportation and packaging activities and taking action. DOE is a major shipper and receiver of radioactive materials in the United States. DOE will gather information describing all major aspects of nuclear materials transport in which DOE, or its contractors, is involved as a shipper or receiver. Based upon the results of the shipment study and the evaluation of existing Environmental Impact Statements and Environmental Assessments, DOE will assess the need for additional documentation and take appropriate action.

As a result of the requirement for transportation to support all ongoing Departmental shipping, all operational activities are Priority 1. Transportation technology development priorities will follow guidelines of the priority system to be established for all the technology development programs. Finally, all funding estimates are considered to be valid. (See Section 1.2.)

The next five years will build on existing programs for transportation safety and open interaction with the public.

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.)



Fiscal Year	90*	91B*	92	93	94	95	96
$ in Millions	12.0	15.2	19.4	22.2	21.9	21.7	21.2

* DP Funded

Figure 6.5a. Activities are planned to foster safe and efficient Department of Energy transportation in support of its program. (R&D = research and development)

Fiscal Year (Thousands of Dollars)

OFFICE	1990	1991B	1992	1993	1994	1995	1996
Albuquerque	4,210	5,789	7,660	8,780	9,120	8,750	8,050
Chicago	205	205	200	350	400	500	600
Nevada	0	0	300	300	300	300	300
Oak Ridge	3,516	3,490	5,017	5,372	5,372	5,377	5,377
Richland	2,512	3,705	4,220	5,335	4,585	4,585	4,585
Headquarters	1,534	2,002	2,000	2,060	2,120	2,190	2,250
TOTAL	11,977	15,191	19,397	22,197	21,897	21,702	21,162

Figure 6.5b. The funding and estimated costs support direction and coordination of Department of Energy transportation activities. It does not include freight charges and other costs of shipping commodities, or transportation costs associated with specific programs.

Attachment A

Corrective Activities Summaries by Site

NOTE: **Validated estimates have been identified that exceed the amount set forth for the FY 1991 President's budget by $30 million. The estimates set forth for FY 1992 are all validated estimates. The estimates for FY 1993 and beyond include validated amounts and may include unvalidated amounts. (See Section 1.2 regarding validated and unvalidated cost estimates.)**

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CORRECTIVE ACTIVITIES FUNDING SUMMARY BY SITE
(Thousands of Dollars)

Operations Office/Installation	FY90	FY91B	FY92	FY93	FY94	FY95	FY96
Albuquerque Operations Office							
Kansas City Plant	4,174	6,049	4,140	316	316	316	316
Los Alamos National Laboratory	7,224	11,478	20,664	9,482	12,168	13,633	5,836
Mound Plant	2,700	1,723	0	0	0	0	0
Pantex Plant	3,053	1,300	315	0	0	0	0
Pinellas Plant	256	0	0	0	0	0	0
Sandia National Laboratory - Albuquerque	2,118	100	3,411	2,154	0	0	0
Sandia National Laboratory - Livermore	217	280	440	0	0	0	0
Albuquerque Other 1/	591	0	0	0	0	0	0
Albuquerque Total	20,333	20,930	28,970	11,952	12,484	13,949	6,152
Chicago Operations Office							
Chicago Combined Laboratories	5,328	10,172	10,200	1,870	603	603	603
Chicago Total	5,328	10,172	10,200	1,870	603	603	603
Idaho Operations Office							
Idaho National Engineering Laboratory	7,800	13,978	7,000	5,000	5,000	3,000	1,000
Idaho Total	7,800	13,978	7,000	5,000	5,000	3,000	1,000
Nevada Operations							
Nevada Test Site	1,737	836	1,660	0	0	0	0
Nevada Total	1,737	836	1,660	0	0	0	0
Oak Ridge Operations Office							
FMPC and Ports	17,129	35,429	23,912	25,839	11,775	8,918	3,220
Oak Ridge Reservation (ORNL ORGDP Y-12)	12,875	17,533	24,737	15,610	30,700	12,400	23,400
Paducah Gaseous Diffusion Plant	889	2,750	12,709	21,700	31,410	10,000	6,200
Oak Ridge Other 1/	33	0	48	48	48	48	48
Oak Ridge Total	30,926	55,712	61,406	63,197	73,933	31,366	32,868
Richland Operations Office							
Richland Site	18,319	22,026	24,777	13,008	11,158	11,158	11,158
Richland Total	18,319	22,026	24,777	13,008	11,158	11,158	11,158
Rocky Flats Office							
Rocky Flats Plant	1,807	1,381	2,921	6,223	2,415	0	0
Rocky Flats Total	1,807	1,381	2,921	6,223	2,415	0	0
San Francisco Operations Office							
SF Laboratories and Installations	6,641	5,441	23,960	29,250	22,200	8,710	2,360
San Francisco Total	6,641	5,441	23,960	29,250	22,200	8,710	2,360
Savannah River Operations Office							
Savannah River Site	39,400	46,600	17,600	0	0	0	0
Savannah River Total	39,400	46,600	17,600	0	0	0	0
TOTAL CORRECTIVE ACTIVITIES	132,291	177,076	178,494	130,500	127,793	68,786	54,141

1/ No installation Summary Table Included in Attachment A.

ALBUQUERQUE OPERATIONS OFFICE CORRECTIVE ACTIVITIES SUMMARY

Nine facilities, located in five different states, are managed by AL. Major compliance issues occur at KCP, Pantex, SNL, and LANL. Thirty-nine projects have been submitted for funding, with the majority of projects consisting of the improvement or upgrade of pollution control and monitoring capabilities. Other projects address improvements to TSCA and RCRA storage facilities. The outyears show decreases in Corrective Activities funding as the problem areas are brought into compliance.

CORRECTIVE ACTIVITIES NEEDED

- Upgrade waste handling and waste management facilities
- Upgrade treatment facilities to ensure effluent discharges within NPDES permit limits
- Store hazardous and toxic wastes in areas below the level of the 100-year flood elevation
- Achieve compliance levels of toxic compounds discharged to POTW
- Clean up contamination of soil and groundwater from leaking USTs and remove, replace, or upgrade USTs
- Reduce emission of gaseous pollutants from air exhausts
- Clean and reline storm sewers to eliminate release of PCBs to nearby streams
- Construct flood walls around all TSCA and RCRA storage areas
- Construct consolidated sanitary and hazardous waste treatment facilities
- Design and construct wastewater treatment facilities
- Upgrade exhausts with volatile organic compound control equipment
- Construct hazardous material storage facilities with spill containment

STATUS

- Phase 1 of Relining the 002 Main Trunk was completed in 1989 (KCP).
- Radioactive Storage Upgrades was completed in 1989 (KCP).
- Start of Flood Protection Improvements is expected in 1991 (KCP).
- Sewer line design construction was completed for TA III; construction is in progress (SNL).
- Design and construction of the RCRA Waste Staging Facility is under way in 1990 (Pantex).
- Procurement and installation of waste treatment equipment for the high-explosive fabrication facilities and USTs is in progress (Pantex).
- Design specifications have been established for a Tritium Monitoring System (SNL).
- Construction was completed during 1989 on the segregation of sanitary and radioactive wastewater at TA 53 (LANL).

ENVIRONMENTAL RISKS

In the event of a 100-year flood occurring before the completion of the proposed Corrective Activity, hazardous and toxic wastes could be dispersed over a wide area by the flood waters. (Kansas City)

SPECIAL CONSIDERATIONS

NPDES permit reapplication must be submitted in September 1990. Early discussions with NMEID and EPA suggest that the permit will be reissued with more stringent water-quality-based effluent requirements. (LANL)

REGULATORY DRIVERS

- FFCAs with EPA and/or States
- CAA/State Air Quality Control Acts
- RCRA/State Hazardous Waste Acts
- CWA/State Water Pollution Control Acts
- TSCA
- State Regulatory Administrative Codes (FL/OH/TX)
- State and EPA UST Regulations
- State Air Toxics Information and Assessment Act (California)

REGULATORY AUTHORITIES

- EPA Regions IV, V, VI, VII, and IX
- BAAQMD
- NMEID
- City of Albuquerque
- MDNR
- Kansas City POTW
- Ohio EPA
- Texas Water Commission
- Florida Department of Environmental Regulation
- Pinellas County Air Quality Division
- Pinellas County POTW
- Texas Department of Health

MAJOR MILESTONES

- Upgrade Liquid Waste Storage Facility, Pinellas (FY 1990)
- Complete UST removal and associated remediation, Pinellas (FY 1990)
- Procure and install RCRA storage units, Pantex (FY 1990)
- Construct RCRA Waste Staging Facility, Pantex (FY 1990)
- Begin construction of spill containment and installation of storage tank, Mound (4Q FY 1990)
- Design and construct effluent discharge holding systems for high explosives and laboratory facilities, Pantex (FY 1991)
- Complete Waste Management Facilities Modifications, Kansas City (1Q FY 1991)
- Complete Surface Coating Operations Emissions Control, Kansas City (1Q FY 1991)
- Complete Flood Protection Improvements, Kansas City (FY 1993)

FUNDING

(Thousands of Dollars)

	EM
FY90	20,333
FY91B	20,930
FY92	28,970
FY93	11,952
FY94	12,484
FY95	13,949
FY96	6,152
FY92-96 TOT	73,507

ALBUQUERQUE OPERATIONS OFFICE CORRECTIVE ACTIVITIES SUMMARY - KANSAS CITY PLANT

KCP, located in Kansas City, Missouri, has one major compliance issue: permit limitations on hazardous and nonhazardous wastes. Six projects have been submitted for funding. Most of these pertain to upgrading the waste treatment facilities and waste management storage areas and limiting VOC from air emissions. The upgrades to Waste Management Facilities and VOC emission controls and the construction of flood walls to protect KCP from a 100-year flood are estimated to be completed in FY 1992. Corrective Activities will total $11 million over the next 5 years and will range from $6 million in FY 1991 to $0.3 million in FY 1993.

CORRECTIVE ACTIVITIES NEEDED

- Achieve compliance levels of toxic compounds discharged to POTW
- Achieve compliance levels of VOCs in air emissions
- Upgrade and protect waste handling and waste management facilities
- Protect hazardous and toxic wastes in areas below the level of 100-year flood elevation
- Construct flood walls around all TSCA and RCRA storage areas
- Clean and reline storm sewers to eliminate release of PCBs to nearby streams
- Clean up PCB spills and/or releases
- Retrofit exhausts for the major KCP painting operations with VOC control equipment
- Upgrade waste management administrative and operational facilities

STATUS

- Completed Phase 1 of relining the 002 Main Trunk in 1989
- Completed radioactive storage upgrades in 1989
- Completed Precious Metals Processing Area upgrades in 1990
- Remaining 1990 milestones are on track, consistent with plan
- Anticipate completion of Design Phase of Flood Protection Improvements in 1990
- Expect start of construction on Flood Protection Improvements in 1991

ENVIRONMENTAL RISKS

In the event a 100-year flood occurs before the completion of the proposed corrective action, hazardous and toxic wastes could be dispersed over a wide area by the flood waters.

SPECIAL CONSIDERATIONS

- Adequate protection does not exist at this time from a 100-year flood event, as required by RCRA and TSCA for storage of hazardous wastes and PCBs. To date, a berm has been partially built. In the event a 100-year flood occurs before the completion of the proposed Corrective Activity, KCP will likely lose its production capacity for an undetermined, but lengthy, period of time.
- The State of Missouri's PCB limitation is extremely strict and aggressively enforced. The Missouri Water Quality Standard for the discharge of PCBs is 0 ppb. KCP's NPDES Permit limit is <1 ppb PCB on a monthly average.
- The construction phase of the Five-Year Plan projects may be delayed if NEPA determinations are not made in a timely manner.

REGULATORY DRIVERS

- RCRA
- TSCA
- CWA
- CAA/Missouri Air Pollution Control Regulation, 10 CSR 10.2.230
- NPDES Permit and related PCB contingency agreement with the MDNR
- DOE Order 5400.1

REGULATORY AUTHORITIES

- MDNR
- EPA Region VII
- Kansas City Missouri Department of Health
- Kansas City Missouri Pollution Control Department

MAJOR MILESTONES

- Installation of Flouride Removal Equipment was canceled and the flouride generating process will be phased out by (4Q FY 1990)
- Complete repair and seal Waste Management storage lots (4Q FY 1990)
- Complete relining of the 001 Main Trunk (4Q FY 1990)
- Complete protection of Waste Management Storage Areas (1Q FY 1991)
- Complete Surface Coating Operations Emissions Control (1Q FY 1991)
- Complete relining of 002 (4Q FY 1991)
- Complete flood protection improvements (FY 1993)
- Design start date to eliminate TTOs from industrial and sanitary sewer discharge (FY 1995)
- Start construction to eliminate TTOs from industrial and sanitary discharge (FY 1995)

FUNDING

(Thousands of Dollars)

	EM
FY90	4,174
FY91B	6,049
FY92	4,140
FY93	316
FY94	316
FY95	316
FY96	316
FY92-96 TOT	5,404

ALBUQUERQUE OPERATIONS OFFICE
CORRECTIVE ACTIVITIES SUMMARY - LOS ALAMOS NATIONAL LABORATORY

At present, 12 Corrective Activities are planned at Los Alamos National Laboratory to redress problems with water pollution, hazardous waste management, and air quality.

CORRECTIVE ACTIVITIES NEEDED

- Design and construct air quality controls at TA-53 to control radioactive air emissions
- Replace PCB transformers and capacitors to alleviate PCB leaks and spills
- Replace USTs to reduce risk of leaks and spills of oils, chemicals, and radioactive liquids
- Design and construct a hazardous waste treatment facility to properly handle and dispose of waste
- Design and construct wastewater treatment facilities to eliminate NPDES Permit violations, reduce potential contamination, and protect surface waters
- Design and construct a Sanitary Wastewater System Consolidation Project to achieve state-of-the-art sanitary wastewater treatment on an areawide basis
- Design and repair septic tanks Laboratorywide to ensure full regulatory compliance
- Design and construct spill prevention and control measures at numerous sites throughout LANL to prevent contamination of watercourses and the environment
- Design and construct stormwater runoff controls at HE firing sites
- Implement water supply protection program

STATUS

- All 12 Corrective Activities are at least in the planning and design phase, while several Activities are in early construction. Specifically, the design for the new Sanitary Wastewater System Consolidation Project is 50 percent complete; a contract is being written to retrofill 20 PCB transformers, while construction on PCB transformer replacement projects is beginning; construction is under way regarding two spill prevention control facilities; and engineering study and design are in progress for all other Corrective Activities.
- During 1989, construction was completed on the segregation of sanitary and radioactive wastewater at TA 53.

ENVIRONMENTAL RISKS

Potential risks are present for PCB transformers regarding leaks or spills that may adversely affect the environment if the corrective activities do not proceed as scheduled. Likewise, other corrective activities targeted to improve compliance with air and water regulations could present environmental risks if funding and schedules are delayed.

SPECIAL CONSIDERATIONS

The Laboratory's NPDES Permit reapplication must be submitted by September 1990, with a new permit expected by March 1991. Early discussions with EPA and NMEID suggest that the permit will be reissued with more stringent water-quality-based effluent requirements.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
• NPDES • FFCA • PCB regulations at 40 CFR 761 • Radioactive air regulations at 40 CFR 61 • CWA • New Mexico Liquid Waste Regulations • New Mexico UST Regulations • RCRA • HSWA • New Mexico Hazardous Waste Regulations	• NMEID • EPA Region VI

MAJOR MILESTONES

- Complete construction of and fully operate a Sanitary Wastewater System Consolidation Plant (4Q FY 1992)
- Complete construction of all needed septic tank facilities and ensure compliance with liquid waste regulations (4Q FY 1992)
- Replace or retrofill all PCB transformers and capacitors so no PCBs are in the inservice inventory (FY 1993)
- Complete construction of and fully operate a Hazardous Waste Treatment Facility (FY 1993)
- Complete construction of all spill control and countermeasure facilities Laboratorywide (FY 1995)
- Complete construction of and fully operate a Centralized High Explosive Wastewater Treatment Facility (FY 1996)
- Complete construction of all NPDES Wastewater Treatment Facilities to ensure NPDES compliance (FY 1996)
- Replace approximately 100 USTs (FY 1996)

FUNDING

(Thousands of Dollars)

	EM
FY90	7,224
FY91B	11,478
FY92	20,664
FY93	9,482
FY94	12,168
FY95	13,633
FY96	5,836
FY92-96 TOT	61,783

ALBUQUERQUE OPERATIONS OFFICE
CORRECTIVE ACTIVITIES SUMMARY - MOUND PLANT

Mound is the only one of ten sites managed by AL that is located in Ohio. The facility, located near Dayton, has two compliance-related issues: prevent unintentional spills and releases due to an aging fuel oil storage system and install a new potable water system to avoid cross connections. No Corrective Activities were identified beyond FY 1992.

CORRECTIVE ACTIVITIES NEEDED	STATUS
• Install new fuel oil storage tank to prevent leakage into groundwater • Install new potable water system to prevent cross contamination of drinking water	• Project design of new storage tanks is complete. • Tank construction is expected to start in third quarter FY 1990. • New potable water system design is complete. • Potable water system is scheduled for completion in FY 1991.

ENVIRONMENTAL RISKS	SPECIAL CONSIDERATIONS
It is possible that if the fuel oil storage tank fails, the oil could reach the Great Miami River and the Buried Valley Aquifer. The latter comprises a main source of drinking water for the city of Miamisburg, Ohio and for the surrounding area.	A 40+-year-old fuel oil storage tank could cause significant environmental degradation should it fail. It does not currently meet Spill Prevention Control and Countermeasure requirements of the CWA or State statutes.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
• CWA • Ohio Revised Code 3745-95 • DOE Order 5400.1 • NEPA	• EPA Region V • Ohio EPA

MAJOR MILESTONES	FUNDING

• Spill containment
  - Complete design (4Q FY 1988)
  - Complete construction (4Q FY 1992)
• Install new storage tank (4Q FY 1990)
• Install new meteorological tower (FY 1991)
	(Thousands of Dollars)

	EM
FY90	2,700
FY91B	1,723
FY92	0
FY93	0
FY94	0
FY95	0
FY96	0
FY92-96 TOT	0

ALBUQUERQUE OPERATIONS OFFICE CORRECTIVE ACTIVITIES SUMMARY - PANTEX PLANT

Pantex, managed by AL, is the only site situated in Texas. The facility, located near Amarillo, has compliance issues centering primarily on RCRA regulations. Eight Corrective Activities projects have been submitted for funding. Most of these pertain to improvements to the treatment and containment of hazardous and low-level radioactive waste. Others address removal and/or replacement of defective USTs. Costs associated with these projects total $4.7 million, with funding levels of $3.1 million in FY 1990, $1.3 million in FY 1991, and $0.3 million in FY 1992. No Corrective Activities have been identified for FY 1993, FY 1995, and FY 1996.

CORRECTIVE ACTIVITIES NEEDED

- Construction of waste storage and spill containment areas to prevent spills of hazardous material in the environment
- Installation and upgrades of hazardous waste treatment units to ensure compliance with regulatory requirements before disposal
- Removal and/or replacement of defective USTs

STATUS

- Procurement of RCRA-compliant storage units is scheduled for October 1990.
- Design and construction of the RCRA Waste Staging Facility are under way in FY 1990. Design of the Hazardous Waste Staging Facility is being worked in conjunction with the RCRA Waste Staging facility.
- Procurement and installation of replacement USTs and/or tank monitoring devices are in progress.
- Procurement and installation of waste treatment equipment for two high-explosive fabrication facilities are in progress.

ENVIRONMENTAL RISKS

No immediate or near-term risks to workers, the public, or the environment are identified in connection with Corrective Activities.

SPECIAL CONSIDERATIONS

The identified Corrective Activities are primarily directed toward protecting the groundwater of the site and the contiguous area. Several Corrective Activities have been identified as being items required to rectify Headquarters Tiger Team findings.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
• 40 CFR 264 • 40 CFR 265 • 40 CFR 268 • 40 CFR 280-281 • RCRA • 31 Texas Administrative Code 335.4 • Texas Underground Storage Tank Program • Texas Solid Waste Disposal Act • Texas Air Control Board Regulation I	• EPA Region VI • Texas Water Commission • Texas Air Control Board • Texas Department of Health

MAJOR MILESTONES

- Design and construct effluent discharge holding systems for high explosives and laboratory facilities
  - Purchase and install equipment (FY 1990)
- Install waste treatment equipment at high-explosive fabrication facilities (4Q FY 1990)
- Complete replacement of tanks and installation of tank monitoring systems on USTs (4Q FY 1990)
- Complete installation of RCRA compliant storage units (4Q FY 1991)
- Complete construction of RCRA Waste Staging Facility (4Q FY 1991)
- Complete modification of burning ground evaporation pans into hazardous waste tanks (4Q FY 1991)

FUNDING

(Thousands of Dollars)

	EM
FY90	3,053
FY91B	1,300
FY92	315
FY93	0
FY94	0
FY95	0
FY96	0
FY92-96 TOT	315

ALBUQUERQUE OPERATIONS OFFICE
CORRECTIVE ACTIVITIES SUMMARY - PINELLAS PLANT

The Pinellas Plant in Florida has identified two Corrective Activities projects. These projects pertain to improvements in liquid waste storage facilities and removal of unused underground storage tanks.

CORRECTIVE ACTIVITIES NEEDED

- Construct adequate containment structure for the liquid storage facility (1990)
- Remove UST and clean up soil and groundwater as necessary (FY 1990)
- Replace one liquid solvent waste storage tank (FY 1990)

STATUS

- Underground Storage Tank Removal/Replacement--Title II Design for replacement of the storage tanks has been completed. Removal of the tanks is scheduled to be completed in FY 1990.
- Liquid Waste Storage Facility Upgrade--A modification to the Pinellas Plant RCRA Operating Permit from the State of Florida has been requested. This modification, in part, requests permission to close the existing storage tank before tank replacement. Replacement of the tank is scheduled to be completed in FY 1992.

ENVIRONMENTAL RISKS

There are only minimal immediate environmental risks through completion of these Corrective Activities.

SPECIAL CONSIDERATIONS

- The Pinellas Plant is located in proximity to a heavily populated residential area; thus, close monitoring and control of environmental releases is of utmost importance.
- Currently, the Pinellas Plant meets air emission requirements; however, the development of emission standards that apply to the plant operation is anticipated.
- Issuance of the modification to the RCRA Operating Permit from the State of Florida is required before completion of the Liquid Waste Storage Facility Upgrade. A closure plan must be submitted and approved. Time delays caused by the State approval cycle will adversely affect completion of this project in FY 1990.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
• **CWA** • **RCRA** • **Florida Administrative Rule, Chapter 17-61, Section 0.050** • **Florida Air and Waste Pollution Control Act**	• EPA Region IV • Florida Department of Environmental Regulation • Pinellas County Air Quality Division • Pinellas County POTW

MAJOR MILESTONES	FUNDING
• Complete Liquid Waste Storage Facility upgrade (FY 1990) • Complete UST removal and associated remediation (FY 1990) • Complete Neutralization Facility upgrades (FY 1990)	(Thousands of Dollars)

	EM
FY90	256
FY91B	0
FY92	0
FY93	0
FY94	0
FY95	0
FY96	0
FY 92-96 TOT	0

ALBUQUERQUE OPERATIONS OFFICE
CORRECTIVE ACTIVITIES SUMMARY - SANDIA NATIONAL LABORATORIES-ALBUQUERQUE AND INHALATION TOXICOLOGY RESEARCH INSTITUTE SUMMARY

SNLA has five Corrective Activities: three previously identified items and two new Corrective Activities pertaining to air pollution control and monitoring and potential cross connections of stormwater and sewer lines. ITRI has two previously identified Corrective Activities pertaining to construction of a sewer line and replacing underground fuel oil storage tanks and lines.

CORRECTIVE ACTIVITIES NEEDED	STATUS
• Characterize groundwater flow regimes at SNL • Construct and monitor sewer line at SNL • Install pollution control and monitoring equipment at SNL • Correct sewer cross connections at SNL • Construct 1.7 miles of sewer line to discharge sanitary wastes into Albuquerque Sewage Treatment Plant at ITRI • Replace, remove, or relocate entire fuel oil system at ITRI	• Initiated data compilation to locate new hydrogeologic wells at SNL • Completed sewer line design for TA III; construction in progress at SNL • Air/water pollution activities to begin in FY 1992 at SNL • Completed leak test on all underground storage tanks in March 1989 at ITRI • Removed two empty fuel tanks in October 1989 at ITRI

ENVIRONMENTAL RISKS	SPECIAL CONSIDERATIONS
• Completion of the sewer line removes the potential for nondomestic wastes in septic systems to be leached continually into the soils. • Discharge of untreated sanitary sewers into storm sewers results in potential contamination of New Mexico's waterways.	• DOE/NMEID Agreement in Principle will identify special air/water pollution conditions that require correction. • The use and construction costs of the sewer line will be shared by ITRI, SNLA, CTA, and Kirtland Air Force Base.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
• RCRA • CWA • CAA • NPDES • City of Albuquerque Sewer Ordinance	• EPA Region VI • NMEID • City of Albuquerque Pretreatment Section • Bernatillo County Air Quality Control Board

MAJOR MILESTONES	FUNDING
• Complete construction of TA III sewer line (4Q FY 1990) • Design air pollution control equipment (4Q FY 1992) • Design and construct TA V sewer line (FY 1993) • Correct sanitary and storm sewer cross connections (FY 1993) • Install/monitor performance of air pollution control equipment (FY 1993) • Complete sewer line connection, ITRI (FY 1991) • Complete fuel tank project, ITRI (FY 1991)	(Thousands of Dollars)

	EM
FY90	2,118
FY91B	100
FY92	3,411
FY93	2,154
FY94	0
FY95	0
FY96	0
FY 92-96 TOT	5,565

ALBUQUERQUE OPERATIONS OFFICE
CORRECTIVE ACTIVITIES SUMMARY - SANDIA NATIONAL LABORATORIES-LIVERMORE

SNLL has one Corrective Activities project: upgrade of the TRL tritium monitor system. Replacement and modernization of the monitoring equipment will ensure the safety of the workers by detecting accidental releases from the glove boxes in the TRL. The capacity of the existing system has been exceeded, and it is considered to be outdated (the monitors have been in existence over 15 years). As required, the new monitors will detect lower level releases of tritium.

CORRECTIVE ACTIVITIES NEEDED

Replacement of two-thirds of the 60 fixed stations and 6 portable stations within the TRL is scheduled to take place over the next 3 years.

STATUS

- An SNLL design team was formed.
- Monitor specification criteria have been determined.
- A survey of monitor manufacturers is being conducted.

ENVIRONMENTAL RISKS

Accidental release of tritium may not be detected by the current monitoring system and could pose a hazard to human health and the environment.

SPECIAL CONSIDERATIONS

- Early submissions to the DOE ER and WM Five-Year Plan failed to include FY 1990 funding.
- Omission of funding in Five-Year Plan has impacts on the Corrective Activities program at SNLL.
- Additional requirements may result from Tiger Team activities.
- Additional requirements apply from the Agreement in Principle between the State and DOE.

REGULATORY DRIVERS

- State of California Air Toxic "Hot Spots" Information and Assessment Act of 1987
- DOE Orders 5400.1 and 5480.1A
- 40 CFR Part 61, Stack Emissions Monitoring Under NESHAPS
- CAA
- DOE HQ Environmental Survey, 1987

REGULATORY AUTHORITIES

- BAAQMD
- EPA Region IX

MAJOR MILESTONES

Laboratory Monitor Upgrades

- Complete first, one-third installation (4Q FY 1991)
- Complete second, one-third installation (4Q FY 1992)
- Complete calibration (4Q FY 1992)
- Complete installation, calibration, system function testing (4Q FY 1993)

FUNDING

(Thousands of Dollars)

	EM
FY90	217
FY91B	280
FY92	440
FY93	0
FY94	0
FY95	0
FY96	0
FY92-96 TOT	440

CHICAGO OPERATIONS OFFICE CORRECTIVE ACTIVITIES SUMMARY

CH has compliance issues at four of its laboratory installations: ANL-E - compliance with NPDES permit limits, control of leachate from a sanitary landfill, upgrades to wastewater collection systems, and effluent controls; BNL - upgrading hazardous waste management facilities; ANL-W, ANL-E, BNL, and Fermi - potential for contamination of soil, groundwater, and/or surface water. Twenty-one Corrective Activities have been identified at these four installations, with costs ranging from \$4.86 million in FY 1990 to approximately \$10 million in FY 1991 and a total cost from FY 1990-1996 of \$26 million.

CORRECTIVE ACTIVITIES NEEDED

- Potential and known contamination of soil, groundwater, and/or surface water must be assessed and cleaned up (ANL-E, BNL, Fermi, ANL-W).
- Sanitary and laboratory wastewater and canal water treatment plants, currently incapable of consistent compliance with NPDES Permit limits, must be repaired or upgraded (ANL-E).
- Sanitary and laboratory wastewater collection systems must be repaired to prevent infiltration of groundwater and exfiltration of wastewater (ANL-E).
- A leachate collection system must be installed at the sanitary landfill (ANL-E).
- Hazardous waste management facilities must be upgraded or constructed to eliminate violations of Federal, State, and local regulations (BNL).
- USTs for hazardous materials must be removed, upgraded, or replaced to comply with county requirements (BNL).
- Miscellaneous effluents must be treated to prevent ongoing NPDES permit violations (ANL-E).
- The RSWF must be upgraded to comply with EPA regulations for permitting mixed waste storage (ANL-W).

STATUS

- Assessment and/or cleanup of pollutant spills and/or releases are under way (ANL-E, BNL, Fermi, ANL-W); contaminated soil was removed from leaking underground gas tank cleanup (Fermi, 1989); required cathodic protection was provided for two tanks (ANL-W, 1989).
- CDRs were completed for repair/upgrade of laboratory and sanitary sewer collection systems and wastewater treatment facilities and for rehabilitation of canal water treatment facilities (ANL-E).
- Preliminary design for the leachate collection system at the sanitary landfill will be completed in 1991 (ANL-E).
- CDR for the hazardous waste management facilities is completed (BNL).
- Work is under way to remove, replace, and upgrade USTs (BNL). Four tanks were removed or abandoned in place in FY 1989. Two tanks were replaced (February 1990).
- Preliminary designs are complete for the coal-pile runoff treatment plant and the chloride removal plant (ANL-E).
- Forty-eight oversized liners were installed in the RSWF (ANL-W, 1989).

ENVIRONMENTAL RISKS

- No immediate health hazard (all installations)
- Potential degradation of surface water (ANL-E)
- Potential contamination of onsite soil and underlying aquifer (ANL-E, BNL)

SPECIAL CONSIDERATIONS

- BNL is located over a designated sole-source aquifer.
- The BNL site has been added to EPA's NPL.
- An inability to collect leachate from sanitary landfill poses multiple liabilities under RCRA, CERCLA, and CWA (ANL-E).
- RSWF is intended for interim storage of mixed TRU waste from the Integral Fast Reactor (ANL-W).

REGULATORY DRIVERS	REGULATORY AUTHORITIES
• RCRA and CERCLA (all installations) • 1987 Joint BNL-Suffolk County Agreement (BNL) • CERCLA Section 120 Interagency Agreement being negotiated among DOE, EPA, and NY State (BNL) • TSCA (Fermi, ANL-W) • DOE/ANL commitment to Illinois EPA to remedy noncompliance with NPDES Permit limits (ANL-E) • State of Illinois Solid Waste Rules and Regulations (ANL-E, Fermi) • CWA (BNL, ANL-E)	• Illinois EPA (ANL-E, Fermi) • New York State Department of Environmental Conservation (BNL) • Suffolk County, Department of Health Services (BNL) • EPA Region II (BNL) • EPA Region V (ANL-E, Fermi) • EPA Region X (ANL-W) • Idaho Department of Health and Welfare (ANL-W)

MAJOR MILESTONES

- Complete construction for treatment of boiler house areas wastewater, ANL-E (4Q 1990)
- Complete modifications of underground and aboveground tanks, BNL (3Q FY 1991)
- Remove cesspool, BNL (4Q FY 1991)
- Complete laboratory wastewater treatment plant improvements, ANL-E (4Q 1992)
- Complete ongoing assessment and/or cleanup of pollutant spills/releases, Fermi, ANL-E, ANL-W (FY 1990-1992)

FUNDING

(Thousands of Dollars)

	EM
FY90	5,328
FY91B	10,172
FY92	10,200
FY93	1,870
FY94	603
FY95	603
FY96	603
FY92-96 TOT	13,879

IDAHO OPERATIONS OFFICE
CORRECTIVE ACTIVITIES SUMMARY

Corrective Activities at INEL primarily pertain to solid waste requirements. Seven Corrective Activities have been identified, with costs ranging from $98 thousand for UST evaluation in FY 1990 to $9 million for mixed waste compliance in FY 1991. The total cost for Corrective Activities from FY 1990-1996 is $41 million.

CORRECTIVE ACTIVITIES NEEDED

- On February 1, 1990, INEL received a Notice of Noncompliance from EPA. Corrective Activities may be necessary after further investigation of the alleged noncompliances identified in the Notice.
- Identification of RCRA compliance concerns at the INEL interim status facilities and implementation of Corrective Activities for these concerns are needed.

STATUS

- Title II design of the LET&D facility is complete. Facility construction is in progress, with pre-startup checkout to start in 1991.
- TRA Liquid Waste Cleanup was not completed in FY 1989 due to permit delays. This activity has been reassigned to the waste management section under landlord activities (landlord was not included last year).
- ICPP injection well was closed (November 1989).
- UST inventory was completed in July 1989. Fourteen tanks have been removed or replaced.
- The Mixed Waste Implementation Program was developed to comply with RCRA.
- ICPP RCRA Part A Permit application has been filed, allowing ICPP to operate under interim status. Part B Permit application for T/S/D units will be filed during the years FY 1990-1993.

ENVIRONMENTAL RISKS

There are only minimal immediate or near-term risks identified in connection with Corrective Activities.

SPECIAL CONSIDERATIONS

- A Notice of Noncompliance was issued by EPA on February 1, 1990, for alleged RCRA violations. This could lead to a FFCA.
- An IAG, still in negotiation, could require that specific activities be performed.

REGULATORY DRIVERS

- RCRA
- COCA
- DOE Order(s) in the 5480.1B series
- Proposed municipal landfill regulations (40 CRF 258)
- DOE Order 5400.1
- IAG still in negotiation

REGULATORY AUTHORITIES

- EPA Region X
- Idaho Department of Health and Welfare
- Idaho Department of Water Resources
- City of Idaho Falls

MAJOR MILESTONES

- Issue draft Waste Characterization Implementation Planning Document (2Q FY 1990)
- Complete facility upgrade priority list (2Q FY 1990)
- Complete Phase I environmental Corrective Activities (3Q FY 1990)
- Complete draft Groundwater Monitoring Implementation Plan (3Q FY 1990)
- Replace or leak test and upgrade all regulated active tanks installed between 1965 and 1974 (1Q FY 1991)
- Complete construction of LET&D Facility (1Q FY 1991)

FUNDING

(Thousands of Dollars)

	EM
FY90	7,800
FY91B	13,978
FY92	7,000
FY93	5,000
FY94	5,000
FY95	3,000
FY96	1,000
FY92-96 TOT	21,000

NEVADA OPERATIONS OFFICE CORRECTIVE ACTIVITIES SUMMARY

The mission of the Corrective Activities planned for NTS is to achieve full compliance with all applicable environmental regulations and DOE requirements. NV has no major compliance issues. Seven projects have been submitted for funding. Three of these projects provide for upgrading the potable water supply system, installing ten sewage systems, and developing three steam cleaning effluent disposal areas. Two projects will provide for compliance with DOE Orders for environmental and radiation protection. The remaining projects address sanitary landfill access control and the evaluation and backfilling of up to 30 abandoned septic tanks. To achieve full compliance by the earliest possible date, all Corrective Activities have been assigned a Priority 1. Except for the inactive septic tank closures, all activities are scheduled for completion by the end of FY 1992.

CORRECTIVE ACTIVITIES NEEDED

- Antisiphon devices will be installed to protect the potable water supply.
- Active sanitary landfills will be fenced, and abandoned landfills will be marked to control access. Logging of shipments will be initiated.
- Existing sewage lagoon systems will be expanded and modernized to meet minimum design capacity requirements.
- To provide compliance with DOE Order 5400.1, nonradiological monitoring and environmental surveillance programs will be implemented; an environmental data base will be established; and reports for radiological, nonradiological, groundwater, and meteorological monitoring will be consolidated.
- A newly lined pond will be constructed for the Area 6 decontamination facility to prevent effluent releases.
- Steam cleaning facilities will be upgraded to correct the improper discharge of industrial wastewater.
- Inactive septic tanks will be evaluated and either backfilled or investigated as CERCLA sites.

STATUS

- One person has received training for cross-connection control inspection. Delays for training additional personnel have delayed installation of potable water protection devices.
- DOE Order 5400.1, Implementation Plan, was completed in November 1989.

ENVIRONMENTAL RISKS

Because of the remoteness and strictly controlled access at NTS, risks to the general public are expected to be minimal. Corrective Activities are needed, however, to eliminate the potential for contamination of potable water supplies used by worker populations. Contamination of soils may have occurred at the steam cleaning effluent disposal areas, the Area 6 decontamination facility, and septic tanks, but, because of the great depth to water at NTS, groundwater contamination at these sites is not expected. Definition of this potential soil contamination and risk assessments will be performed as required by the regulatory authorities.

SPECIAL CONSIDERATIONS

An informal agreement with the State of Nevada has been reached to allow continuation of existing steam cleaning facilities, provided the proposed Corrective Activities are completed in FY 1990. NV is currently negotiating an Agreement in Principle with the State of Nevada that will govern these and other Corrective Activities. The evaluation of inactive septic tanks may identify additional sites that might require CERCLA investigations.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
• State of Nevada Clean Water Regulations • SDWA • CAA • CWA • RCRA • SARA • Title III Regulations • SWDA • DOE Order 5400.1 • DOE Order 5400.3	• State of Nevada, Department of Conservation and Natural Resources and Division of Environmental Protection • EPA Region IX

MAJOR MILESTONES

- Complete installation of potable water system protection (4Q FY 1990 - changed to 4Q FY 1991)
- Upgrade existing sewage systems (4Q FY 1990)
- Submit mixed waste permit application to State of Nevada (1Q FY 1991) - This activity has been moved to Environmental Restoration
- Complete upgrade and construction of steam cleaning facilities (3Q FY 1990 - changed to 4Q FY 1991)
- Complete construction of Area 6 decontamination pond (3Q FY 1990 - changed to 4Q 1990)
- Complete Environmental Monitoring Plan and implement Nonradioactive Environmental Monitoring Program (1Q FY 1992)
- Complete landfill access controls (4Q FY 1992 - New milestone)
- Complete septic tank closures (FY 1996 - New milestone)

FUNDING

(Thousands of Dollars)

	EM
FY90	1,737
FY91B	836
FY92	1,660
FY93	0
FY94	0
FY95	0
FY96	0
FY92-96 TOT	1,660

OAK RIDGE OPERATIONS OFFICE
CORRECTIVE ACTIVITIES SUMMARY
ALL SITES AND FACILITIES

Nine facilities or programs are administered by OR. Major compliance issues arise at ORGDP, PORTS, ORNL, Y-12, FMPC, PGDP, and in FUSRAP. Most projects pertain to improvements in pollution control capabilities. Others address upgrades to the waste treatment facilities and the environmental monitoring and sampling systems. For a detailed summary of FUSRAP, see Attachment B.

CORRECTIVE ACTIVITIES NEEDED

- Develop biological monitoring program to monitor effect on biota and to comply with effluent discharge requirements (PGDP)
- Make improvements to resolve PCB-laden gasket concerns (ORGDP, PGDP, PORTS)
- Install process/runoff water collection systems (PGDP)
- Install systems to control and monitor radiologic air emissions (FMPC)
- Implement water runoff control projects/wastewater treatment studies to prevent further contamination (FMPC)
- Dredge, dewater, and transport sediment for burial and redirect process building drains to meet NPDES permit requirements (PORTS)
- Construct facilities to meet regulatory requirements for disposal of coal ash; eliminate discharge of untreated coal ash sluice water into surface waters (Y-12)
- Design and construct DUOF to eliminate land disposal of depleted uranium/uranium alloy saw fines (Y-12)
- Provide equipment changes or reroute discharges to reduce effluents toxicity into surface waters (ORGDP)
- Test for and correct leaking UST to ensure compliance with RCRA requirements (ORNL)

STATUS

- Preoperational testing of the nitric acid regeneration system was successfully completed in September 1989 (ORGDP).
- Y-12 NPDES Permit application was submitted in November 1989 (Y-12).
- The Stormwater Retention Basin is now in operation at FMPC.
- Engineering and design studies for PCB Control Improvements (gaskets) began in 1989 (PGDP and PORTS). A CDR has been completed for PGDP, and temporary PCB gasket trough installation has begun at Portsmouth.
- An Agreed Order was renegotiated to extend the biological monitoring program to April 1991 (PGDP).

ENVIRONMENTAL RISKS

Improvements to air and water quality are necessary to provide greater worker safety and better environmental protection. However, risk of any environmental insult or adverse impact to public health is low to moderate for the noncompliance situations identified by state compliance inspection and internal DOE appraisals.

SPECIAL CONSIDERATIONS

- Negotiations between DOE and EPA concerning the PCB gaskets are focusing on entering into a Federal Facilities Compliance Agreement that would recognize the use of a trough system as an interim corrective measure with final removal when the facility is decommissioned. The FFCA draft has been submitted to EPA. If no FFCA is negotiated, the PCB cleanup would require replacement of all gaskets (PGDP, PORTS, $491.3 million; ORGDP costs are still being estimated).
- A new NPDES Permit has been issued by Ohio (February 12, 1990), and it may require additional compliance efforts at FMPC and PORTS.
- ORGDP is expecting to obtain an NPDES Permit early in 1990. Projects identified to achieve compliance with this permit have not been allocated funding in FY 1990.
- Effluent discharges from PGDP are being regulated under an Agreed Order with the Kentucky Division of Water.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
• CWA/Tennessee Water Quality Regulations • RCRA/HSWA/Tennessee Hazardous Waste Regulations • TDHE, Subtitle 1 • DOE Orders 5480.1, 5480.11, 5434.1, 5820.2A • FFA draft (EPA Region IV, TDHE, and DOE) • FFA (EPA Region V, DOE) • FFCA (EPA Region IV, DOE) • FFCA (EPA Region V, DOE) • CAA/State Air Pollution Regulations • CERCLA/SARA • TSCA • NEPA • Consent Decree (DOE, Ohio)	• TDHE • EPA Regions IV and V • Kentucky Department for Environmental Protection • Tennessee Water Quality Control Board • Tennessee Air Pollution Control Board • Ohio Department of Health • Ohio Environmental Protection Agency

MAJOR MILESTONES

- Attain FFCA compliance level for nonradiological wastewater treatment plants, ORNL (March 1990)
- Complete Waste Pit Stormwater Runoff Control project, FMPC (FY 1991)
- Complete installation of new monitoring equipment for beryllium stack emissions, Y-12 (March 1992)
- Complete Steam Plant Ash Landfill design and leachate treatment design, Y-12 (September 1992)
- Repair and reroute K-1203 Sewage Treatment Plant lines, ORGDP (September 1992)
- Complete CDR for the DUOF, Y-12 (December 1992)
- Test Wet Stack Sampler Prototypes, FMPC (FY 1992)
- Complete CDR for Process Water and Runoff Collection Systems, PGDP (FY 1992)
- Complete construction of steam plant ash disposal and leachate treatment facility, Y-12 (July 1993)
- Complete construction of PCB control improvements, PGDP (FY 1994)

FUNDING

(Thousands of Dollars)

	EM
FY90	30,926
FY91B	55,712
FY92	61,406
FY93	63,197
FY94	73,933
FY95	31,366
FY96	32,868
FY92-96 TOT	262,770

OAK RIDGE OPERATIONS OFFICE
CORRECTIVE ACTIVITIES SUMMARY
FEED MATERIALS PRODUCTION CENTER AND
PORTSMOUTH GASEOUS DIFFUSION PLANT

Two facilities, FMPC and PORTS, have identified compliance projects located in the State of Ohio. Seven Corrective Activities projects have been submitted for funding relative to these two facilities. The Corrective Activities include improvements to air monitoring and air emission control capabilities; upgrades to wastewater collection, treatment, monitoring, and sampling; and PCB control improvements. Costs associated with these projects total $123.1 million and increase from $17.1 million in FY 1990 to a peak of $25.8 million in FY 1993, then they progressively diminish.

CORRECTIVE ACTIVITIES NEEDED

- Control and monitor radiological air emissions and improve air stack monitoring activities (FMPC)
- Implement water runoff control activities for areas around the plant and wastewater treatment studies to prevent further contamination (FMPC)
- Measure emissions of uranium from wet stacks (FMPC)
- Identify and control contaminated groundwater and soil from runoff and leakage of effluent pipelines (FMPC)
- Modify surge lagoon piping, stormwater retention basin, wastewater treatment systems, and storm sewers to prevent further contamination (FMPC)
- Provide required capabilities for on-line monitoring of current discharges to support NPDES permit (FMPC)
- Dredge, dewater, and transport sediment for burial and redirect process building drains to meet NPDES permit requirements (PORTS)
- Pending EPA approval of variance from PCB usage regulations, install oil collection troughs to collect PCB-contaminated oil drips to meet PCB usage regulations (PORTS)

STATUS

- Engineering studies for PCB control improvements (gaskets) began in 1989. Temporary PCB gasket trough installation began in 1989 and will continue through 1993.
- The Stormwater Retention Basin is now in operation at FMPC.

ENVIRONMENTAL RISKS

The air and water quality improvements are necessary to provide greater worker safety and better environmental protection.

SPECIAL CONSIDERATIONS

- Negotiations between DOE and EPA concerning the PCB gaskets are focusing on entering into a FFCA. The FFCA draft has been submitted to EPA. Total removal and replacement of all gaskets, together with a cleanup of the ducts, would require $266 million over 6 years. Treatment, storage, and disposal costs for these wastes have not yet been estimated.
- A new NPDES permit has been issued by Ohio (February 12, 1990). This may require additional compliance efforts.

REGULATORY DRIVERS

- TSCA
- CWA
- CAA
- CERCLA/SARA
- Consent Decree between DOE and State of Ohio, Section IV, Control of Wastewaters and Runoff, August 1989
- Administrative Consent Order between EPA and DOE, Section 3008(h) of RCRA, as amended, 42 USC Section 6928(h) and 106(a) of CERCLA/SARA, and NEPA
- DOE Orders

REGULATORY AUTHORITIES

- EPA Region V
- Ohio EPA
- Ohio Department of Health
- DOE

MAJOR MILESTONES

- Start design of PCB Control Improvements (Gaskets), PORTS (FY 1990)
- Complete design of Waste Pit Area Stormwater Runoff Control, FMPC (FY 1990)
- Complete design of Wastewater Treatment Facility, FMPC (FY 1991)
- Complete Waste Pit Stormwater Runoff Control project, FMPC (FY 1991)
- Complete construction of Storm Sewer Improvement Project, FMPC (FY 1991)
- Complete installation of prototype Wet Stack Sampler, FMPC (FY 1991)
- Test Wet Stack Sampler Prototype, FMPC (FY 1992)
- Provide NESHAP data to EPA, FMPC (FY 1992)
- Issue evaluation report on prototype, FMPC (FY 1992)
- Complete construction of Wastewater Treatment Facility, FMPC (FY 1993)

FUNDING

(Thousands of Dollars)

	EM
FY90	17,129
FY91B	35,429
FY92	23,912
FY93	25,839
FY94	11,775
FY95	8,918
FY96	3,220
FY92-96 TOT	73,664

OAK RIDGE OPERATIONS OFFICE
CORRECTIVE ACTIVITIES SUMMARY - OAK RIDGE NATIONAL LABORATORY, OAK RIDGE GASEOUS DIFFUSION PLANT, AND Y-12 PLANT

ORNL, ORGDP, and Y-12 are three of nine facilities administered by OR. Each of these Tennessee facilities has extensive environmental compliance programs designed to identify and correct practices that violate current regulations and to minimize the potential for future violations. Corrective Activities being carried out to bring all Oak Ridge Reservation facilities into compliance include changing processes to reduce pollutants, constructing new waste treatment facilities, and improving pollution control systems.

CORRECTIVE ACTIVITIES NEEDED

- Eliminate discharge of untreated coal ash sluice water into surface waters and provide interim measures for minimizing the discharge (Y-12)
- Construct facilities to meet regulatory requirements for disposal of coal ash (Dry Ash Handling Facility, Steam Plant Ash Disposal Facility, and Leachate Treatment System)
(Y-12)
- Replace existing deficient beryllium stack monitoring systems with systems capable of demonstrating compliance with NESHAP regulatory limits (Y-12)
- Complete various Corrective Activities that will eliminate current NPDES violations of discharges into East Fork Poplar Creek and comply with Y-12's NPDES Permit renewal (Y-12)
- Design and construct the DUOF to eliminate land disposal of depleted uranium/uranium alloy sawfines (Y-12)
- Test for and correct leaking USTs to ensure compliance with RCRA requirements (ORNL)
- Install two new boilers to meet plant steam demand and comply with state air pollution control rules (ORGDP)
- Provide equipment changes or reroute plant discharges to reduce toxicity of effluents into surface waters (ORGDP)

STATUS

- Detailed design for the Bethel Valley LLLW-LAT System Update Project will be completed in June 1990.
- Preoperational testing of the nitric acid regeneration system at the Process Waste Treatment Plant was successfully completed in September 1989.
- Y-12 NPDES Permit application was submitted in November 1989.

ENVIRONMENTAL RISKS

Risk of any environmental insult or adverse impact to public health is low to moderate for the noncompliance situations identified by State compliance inspections and internal DOE appraisals.

SPECIAL CONSIDERATIONS

ORGDP is expecting to obtain an NPDES permit early in 1990. Projects identified to achieve compliance with this permit include efforts to reduce water toxicity and rehabilitate the sewage collection system; however, none of these activities is funded in FY 1990.

REGULATORY DRIVERS

- CWA/Tennessee Water Quality Regulations
- RCRA/HSWA/Tennessee Hazardous Waste Regulations
- TDHE, Subtitle 1
- DOE Orders
- FFA (EPA Region IV, TDHE, and DOE)
- FFCA (EPA Region IV, DOE)
- CAA
- CERCLA/SARA
- TSCA
- NEPA

REGULATORY AUTHORITIES

- TDHE
- EPA Region IV

MAJOR MILESTONES

- Complete installation of Boiler No. 8, ORGDP (1Q FY 1990)
- Attain FFCA compliance for nonradiological wastewater treatment plants, ORNL (2Q FY 1990)
- Complete construction of the dry fly ash handling and collection system, Y-12 (3Q FY 1990)
- Complete design study for beryllium stack upgrades, Y-12 (1Q FY 1991)
- Complete installation of Boiler No. 9, ORGDP (1Q FY 1992)
- Complete installation of new monitoring equipment for beryllium stack emissions, Y-12 (2Q FY 1992)
- Complete Steam Plant Ash Landfill design and Leachate Treatment Facility design Y-12 (4Q FY 1992)
- Modify wastewater treatment plants to bring discharges into compliance with 1990 NPDES Permit limits; complete conceptual design Y-12 (4Q FY 1992)
- Repair and reroute K-1203 Sewage Treatment Plant lines, ORGDP (4Q FY 1992)
- Complete construction of Steam Plant Ash Disposal and Leachate Treatment Facility, Y-12 (FY 1993)
- Complete CDR for the DUOF, Y-12 (FY 1993)

FUNDING

(Thousands of Dollars)

	EM
FY90	12,875
FY91B	17,533
FY92	24,737
FY93	15,610
FY94	30,700
FY95	12,400
FY96	23,400
FY92-96 TOT	106,847

OAK RIDGE OPERATIONS OFFICE
CORRECTIVE ACTIVITIES SUMMARY - PADUCAH GASEOUS DIFFUSION PLANT

Four Corrective Activities have been identified from PGDP, which is located in Kentucky within the OR Complex. These projects include a monitoring program to comply with effluent discharge requirements, upgrades to wastewater facilities, improvements to solve PCB gaskets concerns, and closure of a classified landfill. Costs associated with these Corrective Activities total $82 million over the next 5 years. Costs are highest in FY 1994 ($31.4 million), then decrease to $6.2 million in FY 1996.

CORRECTIVE ACTIVITIES NEEDED

- Continue Biological Monitoring Program to ascertain the effects of plant effluents on biota and to comply with effluent discharge requirements
- Improve placement/construction of weirs for KPDES water sampling
- Prepare a CDR for project that provides process water and runoff water collection systems that intercept waste streams before entering storm drains or pen ditches
- Pending EPA approval of variance from PCB usage regulations, install oil collection troughs to collect PCB-contaminated oil drips to meet PCB usage regulations
- Close C-746-F classified solid waste landfill

STATUS

- Agreed Order was renegotiated as the basis to extend the biological monitoring program to April 1991.
- CDR for PCB control improvements project was completed.

ENVIRONMENTAL RISKS

Only minimal near-term risks are identified in connection with Corrective Activities.

SPECIAL CONSIDERATIONS

- Effluent discharges are being regulated under an Agreed Order with the Kentucky Division of Water.
- The alternative chosen pertaining to PCB-saturated ventilation duct gaskets will depend upon the result of negotiations in progress between DOE and EPA. Currently, removal and replacement of all gaskets and cleanup of ducts is the only choice for total compliance and for continuing to operate. Negotiations between EPA and DOE are focusing on entering into an FFCA with EPA. Total removal and replacement of all gaskets, together with a cleanup of the ducts, would require $225 million. Treatment, storage, and disposal costs for these wastes have not yet been estimated.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
• CWA/KPDES Regulations • TSCA • DOE Orders	• EPA Region IV • Kentucky Department for Environmental Protection, Division of Water

MAJOR MILESTONES

- Complete closure of classified landfill (FY 1990)
- Complete requirements of Biological Monitoring Program (FY 1991)
- Complete design of troughing option for PCB control improvements (FY 1992)
- Complete CDR for Process Water and Runoff Collection Systems (FY 1992)
- Complete construction of PCB control improvements (FY 1994)

FUNDING

(Thousands of Dollars)

	EM
FY90	889
FY91B	2,750
FY92	12,709
FY93	21,700
FY94	31,410
FY95	10,000
FY96	6,200
FY92-96 TOT	82,019

RICHLAND OPERATIONS OFFICE CORRECTIVE ACTIVITIES SUMMARY

RL's compliance issues center primarily on RCRA regulations. There are no violations of the CWA and only minor problems with DOE Orders and the CAA. Thirty-six projects/activities have been submitted for funding. Many address upgrading and permitting hazardous and nonhazardous waste treatment, storage, and disposal facilities. Costs associated with these Corrective Activities range from $15 million in FY 1990 to $1 million in FY 1996. All Corrective Activities are directly related to the recently signed FFA and COCA with the State of Washington and EPA Region X.

CORRECTIVE ACTIVITIES NEEDED

- Activities are needed to achieve RCRA, CAA, CWA, NEPA, and TSCA compliance with existing Federal and State requirements (40 CFR 260-272, 40 CRF 761, WAC-173-303, etc.). Major activities include (1) starting construction of the Enclosed Material Handling Facility and the PFP Drum Storage Facility to provide RCRA-compliant hazardous waste storage and (2) completing the following:
  - determination of NEPA compliance requirements for chemical processing facilities;
  - inventory and cleanup of faulty PCB light ballasts;
  - installation of cathodic protection of buried pipelines and catch tanks (project W-020);
  - preparation of contingency plans for SSTs, DSTs, and 242-A Evaporator to comply with RCRA requirements;
  - RCRA-required waste analysis plans for DSTs, 242-A Evaporator, and B-Plant active TSD Units; and
  - definitive design and construction of Phase I and II of the Solid Mixed Waste Disposal Facilities.
- Activities at DOE-RL facilities are subject to interim status requirements of 40 CFR 265 until Part B Permits are approved.
- Activities are needed for additional analyses and measurements for point source radioactive air emissions.

STATUS

- The definitive design of cathodic protection system for waste management facilities is complete. Construction has started.
- The interim status compliance actions for SSTs and DSTs have been identified.
- The definitive design review of the Mixed Waste Storage Facilities was completed in September 1989.
- A preliminary inventory of hot cell facilities having potential PCB-leaking light ballasts has been completed. Sampling and cleanup of residues to EPA standards has been accomplished where worker exposure could be a problem. Routine leakers have been controlled.
- Functional Design Criteria for the Enclosed Material Handling Facility have been approved, and the project is in the conceptual design stage.
- Functional Design Criteria for the PFP Drum Storage Facility have been approved.
- Part B Permits and/or Closure Plans have been submitted in accordance with the Tri-Party Agreement milestones.
- The regulations requiring air monitors/samplers have just passed. Installation will be completed by the end of September 1991.

ENVIRONMENTAL RISKS

No immediate or near-term risk to the public or workers has been identified in connection with Corrective Activities.

SPECIAL CONSIDERATIONS

The Hanford FFA and COCA establish specific actions and timetables to bring the Hanford Site into full compliance with RCRA and CERCLA regulations. This Agreement was signed May 15, 1989, after having been through a public review and comment period.

REGULATORY DRIVERS

- Hanford FFA and COCA (May 1989)
- DOE Orders 5400.1, 5400.3, and 5820.2A
- RCRA (40 CFR 264, 265, 266, 268 and 270)
- Washington Administrative Code 173-201,-215,-220, and -303
- CAA
- CWA
- TSCA
- FIFRA
- 36 CFR 296 and WAC 25-42, Archeological Resources Protection Act

REGULATORY AUTHORITIES

- State of Washington Departments of Ecology, Social and Health Services, Natural Resources, and Agriculture
- State of Washington Office of Archeology and Historical Preservation
- Benton-Franklin-Walla Walla Counties Air Pollution Control Authority
- Benton-Franklin District Health Department
- EPA Region X
- U.S. Army Corps of Engineers

MAJOR MILESTONES

- Complete installation of cathodic protection system for waste management facilities (4Q FY 1990)
- Complete construction of Phase I of solid radioactive mixed waste storage facilities (4Q FY 1990)
- Provide interim status compliance actions for SST and DST farm units to achieve RCRA compliance (1Q FY 1991)
- Start construction of enclosed material handling facility (1Q FY 1991)
- Start construction of PFP drum storage facility (2Q FY 1991)
- Submit 17 Part B Permits and/or Closure Plans (3Q FY 1991)
- Remove PCBs from radioactive facilities (4Q FY 1991)
- Complete installation of required air monitors/samplers for operations facilities (4Q FY 1991)

FUNDING

(Thousands of Dollars)

	EM
FY90	18,319
FY91B	22,026
FY92	24,777
FY93	13,008
FY94	11,158
FY95	11,158
FY96	11,158
FY92-96 Total	70,487

ROCKY FLATS OFFICE
CORRECTIVE ACTIVITIES SUMMARY

RFP is managed by RF. The facility, located near Denver, has a compliance concern regarding the discharge and seepage of treated sanitary effluent water reaching the drinking water supply reservoirs of the site's adjacent communities of Westminster and Broomfield. Costs of the eight Corrective Activities submitted total $29 million over the next 5 years, ranging from $15.9 million in FY 1990 to $0 in FY 1996. Most of the Activities are related to the FFCA with EPA and the CDH. Activities were also affected by the June 16, 1989, Agreement in Principle between DOE and CDH and the December 1989 draft IAG among DOE, CDH, and EPA.

CORRECTIVE ACTIVITIES NEEDED

- RFP lacks a comprehensive data base to track radioactive and mixed wastes, as well as residues.
- Current monitoring of RCRA facilities and environmental releases requires significant upgrades.
- Pollution abatement controls have been adversely affected by settling; that is, releases of sediments may occur that exceed permit conditions.
- Residues are not adequately characterized to determine if they are to be considered hazardous wastes under RCRA.

STATUS

- Ambient VOC samplers for 26 locations have been purchased. A contractor is being selected for installation and operation of these samplers.
- Air stack monitoring equipment is being upgraded and includes new flow rate totalizers and calibrations.
- Revised APENS were submitted on existing sources. New APENS were submitted for Building 709. CDH inspected Building 771 on February 16, 1990.
- Comprehensive organic analyses for RFP surface waters were performed in August 1989 and January 1990. Toxicity testing has been initiated.
- Wastewater treatment facilities are being updated to ensure compliance with permit conditions.
- Water analysis and data bases are being improved to track radioactive and mixed wastes and residues.
- A sitewide audit and monitoring system is being implemented to detect leaks from waste management locations and processes and to assess other releases of pollutants into the environment.
- Updated RCRA Permit application sections are being prepared for units included in the Notice of Intent to Deny issued by CDH in October 1989.

ENVIRONMENTAL RISKS

- RFP is located upstream from the raw water supply reservoirs of Westminster and Broomfield.
- No identified conditions presently exist on or near the RFP site that pose an imminent hazard to human health.

SPECIAL CONSIDERATIONS

RFP currently operates under RCRA Interim Status Regulations/Requirements. A draft RCRA Permit covering low-level, mixed, and hazardous waste storage areas was issued in October 1989. The final permit for these units is expected to be issued sometime in 1990.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
• FFCA with EPA Region VIII and CDH • RCRA/Colorado State Hazardous Waste Regulations • CWA Section 402 • CAA/NESHAPS • CAA/Colorado Air Quality Control Act Regulations • DOE Order 5400.1 • 1989 DOE/CDH Agreement in Principle • Pending HWSA permit for hazardous and mixed waste storage units • Residue compliance agreement with CDH (October 3, 1989) • Draft Permit and Notice of Intent to Deny by CDH (October 4, 89)	• EPA Region VII • CDH • Colorado Water Commission

MAJOR MILESTONES	FUNDING
• Initiate upgrades to the wastewater treatment facilities to ensure compliance with permit conditions (1Q FY 1990) • Begin APENs adjustments to comply with State regulations (2Q FY 1991) • Implement Gaseous Emissions Monitoring Program (4Q FY 1991) • Commence waste stream tracking and analysis program (4Q FY 1991) • Institute air emissions inventory (1Q FY 1992) • Initiate new emissions sampling program (FY 1994)	(Thousands of Dollars)

	EM
FY90	1,807
FY91B	1,381
FY92	2,921
FY93	6,223
FY94	2,415
FY95	0
FY96	0
FY92-96 TOT	11,559

SAN FRANCISCO OPERATIONS OFFICE CORRECTIVE ACTIVITIES SUMMARY

Fifteen Corrective Activities have been identified by SAN. The major SAN items in dollar terms are construction of stacks and monitoring upgrades (LLNL), construction of diversion system and tank upgrading (LLNL), rehabilitation of sanitary sewer pipes (LLNL), and assessment and mitigation of air toxic emissions (LBL). Corrective Activities for SAN facilities will cost $7.1 million in FY 1990 and will total $106 million by FY 1996.

CORRECTIVE ACTIVITIES NEEDED

- Install Waste Water Treatment Unit to ensure compliance with existing water discharge limits (LBL)
- Construct system to divert unacceptable sewer releases from the municipal sewer system into storage tanks and upgrade the tanks to prevent leakage (LLNL)
- Repair leaks in the sanitary sewer system by replacing existing pipes and cross connections (LLNL)
- Determine if any exhaust from LBL facilities adversely impacts offsite environment; minimize release of hazardous air contaminants to the offsite environment (LBL)
- Minimize cooling water flows while ensuring that discharge from SCTI cooling towers does not exceed NPDES limits (ETEC)
- Install sanitary sewer monitoring system to provide control of sewage releases (LLNL)
- Install double-wall USTs and monitoring equipment to bring LBL into compliance with existing regulations (LBL)
- Install double containment lines and monitoring systems for effluents from plating shop (SLAC)

STATUS

- Waste Water Treatment Unit installation is complete at LBL.
- The design of the sanitary sewer diversion system is complete at LLNL.
- Five of nine satellite sanitary sewer stations are operating at LLNL. The remainder will be operating by 4Q FY 1990.
- Title I, Title II, and Engineering Design of the UST Fuel System are complete at LBL.
- The conceptual design to install new waste transfer lines and a monitoring system in the plating shop is complete.
- Construction of a Sewer Diversion System is scheduled for completion in October 1990.
- Sewer pipe rehabilitation and cross connection conceptual design is scheduled for FY 1990 completion.
- Milestones for air toxics are on schedule. The Emission Inventory Plan was submitted to the BAAQMB in October 1989.
- Conceptual design is complete for the brine concentration system for SCTI. Construction milestones are on schedule.
- LBL plans to complete construction of USTs by December 1990 (LBL-2008).
- Completion of containment lines for the Plating Shop scheduled for December 31, 1990, is dependent on receiving funding by April 1990 (SLAC-3004).

ENVIRONMENTAL RISKS

- Potential of unacceptable waste releases to City of Livermore sewer system (LLNL)
- Continued risk of leaking pipes and misrouted effluents (LLNL)
- No immediate or near-term risks identified at LBL or SLAC

SPECIAL CONSIDERATIONS

- A DOE Tiger Team will be inspecting LLNL operations in April 1990.
- A determination was made at DOE/HQ that NE and NPR would use program funds to jointly fund the SCTI NO_x emission control system for the ETEC site. The ADS for this activity under the Corrective Activities area has been removed.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
• California Administrative Code Title 22, 23, and 26 • State of California AB 1807 and 2588 • California Environmental Quality Act • California Porter-Cologne Act • California RWQCB (S.F. Bay Region) • Ventura County Air Pollution Control District • Central Valley Regional Water Control Board • East Bay Municipal Utility District Ordinance 270 • City of Berkeley, Tank Testing and Monitoring Program • DOE Allowable Discharge Limit DOE Order 5400 • NESHAPS • NPDES • CWA • NEPA • RCRA	• California RWQCB (S.F. Bay Region) • California DHS, Toxic Substances Control Division • California Department of Fish and Game • Alameda County Health Department • San Joaquin County Air Pollution Control District • San Joaquin County Health Department • Ventura County Department of Environmental Health • Ventura County Air Pollution Control District • Bay Area Air Quality Management District • City of Berkeley Health Department • City of Livermore Regulatory Office • EPA Region IX

MAJOR MILESTONES

- Complete construction of satellite sewer monitoring stations, LLNL (4Q FY 1990)
- Complete system changeover and disposal of existing wastewater treatment unit in accordance with provisions of the California Department of Health Services' permit (3Q FY 1990)
- Complete construction of sanitary sewer diversion system, LLNL (1Q FY 1991), and tank system upgrade, LLNL (FY 1995)
- Complete installation of Underground Fuel Storage Tanks, LBL (1Q FY 1991)
- Complete installation of new underground waste transfer lines and monitoring system for Plating Shop, SLAC (1Q FY 1991)
- Complete construction of disposal system for cooling tower blowdown and demineralizer regeneration wastewater from SCTI, ETEC (1Q FY 1992)
- Complete Title I and Title II design for sanitary sewer pipe rehabilitation project, LLNL (FY 1992)
- Complete Air Toxics Facility Assessment and Rehabilitation Title I (FY 1993); complete Title II (FY 1994); complete construction, LBL (FY 1996)

FUNDING

(Thousands of Dollars)

	EM
FY90	6,641
FY91B	5,441
FY92	23,960
FY93	29,250
FY94	22,200
FY95	8,710
FY96	2,360
FY92-96 TOT	86,480

SAVANNAH RIVER OPERATIONS OFFICE
CORRECTIVE ACTIVITIES SUMMARY

SR has only one Corrective Activity that was submitted in the FY 1991 version of the Environmental Restoration and Waste Management Five-Year Plan. This Corrective Activity is Thermal Mitigation for the K-Reactor. The total estimated cost for this FY 1989 Line Item is $79 million, and it is scheduled to be completed by December 31, 1992.

CORRECTIVE ACTIVITIES NEEDED

The Cooling Tower will be built for the K-Reactor to mitigate thermal discharges for reuse in the reactor building. The goal is to cool the reactor water before discharge into the waters of South Carolina to prevent harming vegetation or aquatic life.

Currently, there is a Capital Equipment project for FY 1990 that is funded under GE, Nuclear Materials Production, to resolve the issue of the A-008 outfall. This project includes a pH neutralization system, a solids treatment facility, cooling towers, and all necessary sewer lines and pipes. The State of South Carolina has said that this must be completed by December 31, 1990, or the powerhouse must be shutdown. Since this is funded under GE, Nuclear Materials Production, it has been removed from this plan.

STATUS

The contracts for building the K-Reactor Cooling Tower have been awarded, the conceptual design bids have been completed, and the site preparation contractor was mobilized on November 20, 1989. Preliminary site preparation is scheduled for completion in FY 1991.

ENVIRONMENTAL RISKS

Health studies conducted by the CDC and reported in 1984 and the Savannah River EIS, published in 1987, have not identified any immediate or short- term onsite offsite health risks. The Savannah River Site Environmental Report for 1988 (WSRC, 1989) did not list any environmental or health risks.

SPECIAL CONSIDERATIONS

Before the primary subcontractor can begin construction of the K-Reactor Cooling Tower, several permits from the State of South Carolina must be issued, such as the NPDES Permit and a construction permit. Also, the subdrainage system will affect 0.5 acres of wetlands. SR will have to apply to the U.S. Army Corps of Engineers to determine if a permit is necessary, pursuant to Section 404 of the CWA.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
• Consent Order with the State of South Carolina, CO-84-4-W • CWA/South Carolina Pollution Control Act (Title 48, Chapter 1) • Federal Water Pollution Control Act (Water Quality Act of 1987) • Executive Order 12088	• EPA Region IV • South Carolina Department of Health and Environmental Control • U.S. Army Corps of Engineers

MAJOR MILESTONES	FUNDING
• Complete Title II design (3Q FY 1990) • Ensure that system is operational (FY 1993)	(Thousands of Dollars)

	EM
FY90	39,400
FY91B	46,600
FY92	17,600
FY93	0
FY94	0
FY95	0
FY96	0
FY92-96 TOT	17,600

Attachment B

Environmental Restoration Summaries by Site

NOTE: Validated estimates for Environmental Restoration (ER), Waste Management (WM), and Corrective Activities (CA) have been identified that exceed the amount set forth for the FY 1991 President's budget by $605 million. $1,528 million of the total ER, WM, and CA estimates set forth for FY 1992 is unvalidated. The estimates set forth for FY 1993-1996 include both validated and unvalidated amounts. (See Section 1.2 regarding validated and unvalidated cost estimates.)

ENVIRONMENTAL RESTORATION FUNDING SUMMARY BY SITE (cont'd)
(Thousands of Dollars)

Operations Office/Installation	FY90	FY91B	FY92	FY93	FY94	FY95	FY96
Richland Operations Office							
Hanford Site 100	17,087	10,790	60,641	85,931	101,658	96,587	92,285
Hanford Site 200	19,554	31,533	43,382	64,096	104,119	126,553	163,811
Hanford Site 300	4,376	5,001	24,765	31,866	35,093	29,988	26,083
Hanford Site 1100	4,944	5,494	9,370	12,320	12,830	37,800	37,800
Richland Other 1/	38,399	49,038	87,439	86,396	89,254	90,235	93,801
Richland Total	84,360	101,856	225,597	280,609	342,954	381,163	413,780
Rocky Flats Office							
Rocky Flats Plant	57,814	40,500	45,692	30,171	45,204	46,764	62,817
Rocky Flats Total	57,814	40,500	45,692	30,171	45,204	46,764	62,817
San Francisco Operations Office							
Lawrence Livermore National Laboratory	17,313	19,462	36,850	28,100	18,350	16,900	16,600
ETEC, LBL, LEHR, and SLAC	5,454	9,986	23,199	15,046	8,041	6,193	571
San Francisco Total	22,767	29,448	60,049	43,146	26,391	23,093	17,171
Savannah River Operations Office							
Savannah River Site	60,862	62,427	84,357	109,824	122,263	143,252	145,589
Savannah River Total	60,862	62,427	84,357	109,824	122,263	143,252	145,589
Headquarters Office 1/	45,036	59,298	57,698	56,206	55,410	57,260	59,360
TOTAL ENVIRONMENTAL RESTORATION	715,213	949,839	1,737,393	2,009,887	2,090,970	2,161,134	2,040,384

1/ No Installation Summary Table included in Attachment B.

ENVIRONMENTAL RESTORATION FUNDING SUMMARY BY SITE
(Thousands of Dollars)

Operations Office/Installation	FY90	FY91B	FY92	FY93	FY94	FY95	FY96
Albuquerque Operations Office							
Inhalation Toxicology Research Institute	182	65	6,280	6,234	6,080	2,586	432
Kansas City Plant	2,685	4,564	20,655	26,064	13,222	16,772	5,901
Los Alamos National Laboratory	16,143	15,408	120,610	160,220	161,900	131,970	86,180
Mound Plant	16,438	23,057	47,934	44,882	59,931	64,249	51,787
Pantex Plant	2,950	9,428	10,856	11,376	12,266	12,486	12,566
Pinellas Plant	1,607	2,692	3,039	3,272	6,388	6,519	7,442
Sandia National Laboratory - Albuquerque	4,074	4,352	12,994	14,683	15,280	9,071	7,639
Sandia National Laboratory - Livermore	1,019	1,256	9,883	5,527	5,304	1,041	1,041
South Valley Site	1,300	3,000	2,064	872	872	872	872
Uranium Mill Tailings Remedial Action Project	61,504	96,245	121,623	143,310	70,368	44,465	35,000
Albuquerque Other 1/	1,918	1,830	4,620	4,830	4,830	4,830	4,830
Albuquerque Total	109,820	161,897	360,558	421,270	356,441	294,861	213,690
Chicago Operations Office							
Argonne National Laboratory - East	5,963	15,091	17,452	22,493	16,957	13,571	11,001
Argonne National Laboratory - West	0	210	2,237	295	268	268	268
Brookhaven National Laboratory	3,909	7,455	4,705	3,113	10,855	10,510	61
Chicago Combined Laboratories	1,579	11,905	18,695	15,388	18,598	16,597	12,656
Fermi National Acceleration Laboratory	0	0	64	0	0	0	0
Princeton Plasma Physics Laboratory	0	0	20	21	15	15	15
Chicago Total	11,451	34,661	43,173	41,310	46,693	40,961	24,001
Idaho Operations Office							
Grand Junction Project Office	36,120	36,792	46,191	23,055	15,470	11,020	6,120
Idaho National Engineering Laboratory	44,912	38,759	81,324	83,700	74,080	71,630	82,490
Idaho Total	81,032	75,551	127,515	106,755	89,550	82,650	88,610
Nevada Operations							
Nevada Test Site	2,714	13,900	39,110	60,863	98,358	98,534	100,250
Nevada Offsite Test Locations	135	207	2,775	2,915	3,300	3,900	8,050
Nevada Total	2,849	14,107	41,885	63,778	101,658	102,434	108,300
Oak Ridge Operations Office							
Feed Materials Production Center	42,245	82,482	154,945	274,206	337,266	387,709	343,702
Formerly Utilized Sites Remedial Action Program	12,323	34,565	47,626	66,642	82,654	86,554	82,117
Oak Ridge Gaseous Diffusion Plant	55,218	94,773	153,424	137,617	137,576	156,088	135,883
Oak Ridge National Laboratory	37,054	62,816	145,660	178,236	133,120	153,862	170,367
Paducah Gaseous Diffusion Plant	21,467	20,485	30,808	34,953	27,595	19,595	11,097
Portsmouth Gaseous Diffusion Plant	19,998	11,178	27,880	23,768	46,988	44,488	28,188
Weldon Spring Remedial Action Project	9,530	25,985	51,543	52,845	48,561	51,499	49,298
Y-12 Plant	28,268	31,140	51,601	59,703	60,392	59,227	60,597
Oak Ridge Other 1/	13,119	6,670	27,382	28,848	30,254	29,674	25,817
Oak Ridge Total	239,222	370,094	690,869	856,818	904,406	988,696	907,066

1/ No Installation Summary Table included in Attachment B.

ALBUQUERQUE OPERATIONS OFFICE
INSTALLATION SUMMARY - INHALATION TOXICOLOGY RESEARCH INSTITUTE

ITRI occupies approximately 200,000 square feet of laboratory space on the south edge of Kirtland AFB in Albuquerque. The laboratory houses up to 15,000 research animals and generates sanitary, hazardous, radioactive, and mixed wastes. ITRI conducts studies on the health effects of inhaling fission products, fuel cycle actinides, insulating materials, coal combustion effluents, and diesel exhaust emissions.

EXTENT/TYPES OF CONTAMINATION	STATUS
Four areas were identified as requiring investigation: • sanitary lagoons - could contain RCRA wastes • groundwater under sanitary lagoons - contains elevated levels of nitrates • hot ponds - could contain RCRA wastes, and • USTs - could be releasing diesel oil	• USTs were tested; one tank failed tightness test and was permanently removed from service. • Two empty USTs have been removed. • Diesel oil contamination of soil to a depth of 75 ft has been found. • Hot pond cleanup has been completed, and all radioactive sediment has been removed. Contaminated concrete remains.

HEALTH RISKS	SPECIAL CONSIDERATIONS
No immediate health risks have been identified based on information available to date.	If ITRI is unable to connect to the Albuquerque sewage treatment plant or unable to remediate the nitrate plume, NMEID could withdraw the discharge permit, which would effectively shut down the facility.

REGULATORY DRIVERS

- NMEID discharge permit for sanitary lagoons
- State and Federal UST regulations
- RCRA
- Applicable State regulations
- DOE Orders

REGULATORY AUTHORITIES

- NMEID
- EPA Region VI

MAJOR MILESTONES

- Complete hot pond structure removal task (FY 1991)
- Complete assessments for sanitary lagoons, nitrates in groundwater, diesel oil release, and hot ponds remediation tasks (FY 1992)
- Complete cleanup of sanitary lagoons, hot ponds remediation tasks (FY 1994)
- Complete cleanup of nitrates in groundwater, diesel oil release tasks (FY 1995)

CONTINUATION

FUNDING

Funding By Priority Level
(Thousands of Dollars)

Year	Priority 1		Priority 2		Priority 3		Priority 4		Total	
	A*	C**	A	C	A	C	A	C	A	C
FY90	0	0	0	0	0	182	0	0	0	182
FY91B	0	0	0	0	0	65	0	0	0	65
FY92	0	0	1,928	2,498	1,132	722	0	0	3,060	3,220
FY93	0	0	0	3,275	0	2,959	0	0	0	6,234
FY94	0	0	0	3,053	0	3,027	0	0	0	6,080
FY95	0	0	0	2,442	0	144	0	0	0	2,586
FY96	0	0	0	144	0	288	0	0	0	432
FY 92-96 TOT	0	0	1,928	11,412	1,132	7,140	0	0	3,060	18,552

A* Assessment C** Cleanup

Grand Total 21,612

ALBUQUERQUE OPERATIONS OFFICE
INSTALLATION SUMMARY - KANSAS CITY PLANT

KCP is part of the Bannister Federal Complex, located 12 miles south of downtown Kansas City, Missouri. The facility occupies approximately 136 acres, with the manufacturing operation housed in 3.2 million square feet of building space. KCP manufactures an extensive variety of nonnuclear components for nuclear weapons. Miniature electrical components include cables, printed wiring boards, transformers, coils, and microelectronic devices. No radioactive materials are machined or processed. Site characterization began in 1983. Thirty-five sites are identified in the RCRA 3008(h) Administrative Order on Consent for ER.

EXTENT/TYPES OF CONTAMINATION

The primary contaminants at KCP are PCBs and chlorinated solvents. Past PCB spills have created soil and groundwater contamination in at least three locations. Solvents have also created soil and groundwater contamination in at least four locations. One solvent plume appears to be discharging low levels of contaminants to the Blue River.

STATUS

- Completed installation assessment (1986)
- Completed three RI plans (1987-1988)
- Completed three RI reports (1988-1989)
- Completed installation of extraction wells and an ultraviolet/ozone/hydrogen peroxide groundwater treatment system to remove chlorinated organics originating from underground tank farm (1987)
- Completed removal of 28 underground tanks, piping, and soil contaminated with chlorinated organics, oils, and coolants (1988)
- Removed and disposed of offsite PCB-contaminated soils, relined 002 raceway, and capped nearby area (1989)
- Completed two RFI/CMS documents, a groundwater optimization study, one RFI and two RFI work plans (FY 1989)
- Assessments scheduled for completion in FY 1990 and FY 1991 are on schedule

HEALTH RISKS

No immediate health risks have been identified based on information available to date; however, primary concerns are PCB contamination of the outfalls and VOC contamination of the groundwater.

SPECIAL CONSIDERATIONS

An in situ cleanup technology was the original method of choice for remediation of the old Indian Creek outfall PCB contamination. EPA rejected the method and has suggested excavation and incineration. Other alternatives are being explored.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
• RCRA 3008(h) Administrative Order on Consent • RCRA Part B Permit Land Disposal Postclosure Application • TSCA • Applicable State regulations • DOE Orders	• MDNR • Kansas City, Missouri, Pollution Control Department • EPA Region VII

MAJOR MILESTONES	CONTINUATION
• Complete assessments on one task (Abandoned Indian Creek Outfall) in FY 1990 and two more in FY 1991 (South Lagoon and Northeast Area) • Complete one cleanup task (Abandoned Indian Creek Outfall) in FY 1993 • Complete assessments for five tasks in FY 1992 (Plating Building, Department 27 and Miscellaneous PCB Sites, Classified Trench, TCE Still Area, and Miscellaneous Contaminated Soil Sites), two in FY 1993 (Outfall 001 Raceway and Department 26), one in FY 1994 (Department 27-Inside) • Complete cleanup for one task in FY 1993, (Abandoned Indian Creek Outfall), one task in FY 1995 (South Lagoon), and one in FY 1996 (Outfall 001 Raceway)	

FUNDING

Funding By Priority Level
(Thousands of Dollars)

Year	Priority 1		Priority 2		Priority 3		Priority 4		Total	
	A*	C**	A	C	A	C	A	C	A	C
FY90	0	0	555	2,107	23	0	0	0	578	2,107
FY91B	0	0	2,680	1,378	506	0	0	0	3,186	1,378
FY92	0	0	2,606	17,549	500	0	0	0	3,106	17,549
FY93	0	0	3,045	22,519	500	0	0	0	3,545	22,519
FY94	0	0	800	12,222	200	0	0	0	1,000	12,222
FY95	0	0	600	16,072	100	0	0	0	700	16,072
FY96	0	0	500	5,401	0	0	0	0	500	5,401
FY 92-96 TOT	0	0	7,551	73,763	1,300	0	0	0	8,851	73,763

A* Assessment C** Cleanup

Grand Total 82,614

ALBUQUERQUE OPERATIONS OFFICE
INSTALLATION SUMMARY - LOS ALAMOS NATIONAL LABORATORY

LANL occupies about 24,400 acres in Los Alamos County, approximately 90 miles north-northeast of Albuquerque and 25 miles northwest of Santa Fe. The Laboratory is situated on the Pajarito Plateau, which is made up of fingerlike mesas ranging in elevation from 6,200 to 7,800 ft. Major programs at LANL include applied research in nuclear and conventional weapons development, nuclear fission and fusion, nuclear safeguards and security, and waste management. Approximately 600 potential release sites are currently scheduled for investigation under HSWA. Seven surplus facilities are identified for D&D in the Five-Year Plan.

EXTENT/TYPES OF CONTAMINATION

The approximately 600 potential release sites scheduled for investigation are a result of historic operational practices (e.g., disposal in trenches, pits, shafts, and routine untreated releases to canyons) or accidents (e.g., leaks and spills). Waste streams include:

- processing operations--radionuclides, solvents, organics, and metals;
- R&D activities--laboratory reagents, chemicals, solvents, metals, and radionuclides;
- high-explosives operations--barium, metals, and high explosives; and
- D&D activities--large quantities of building debris contaminated with radionuclides and high-explosive residuals.

STATUS

Remedial Actions

- Approximately 600 potential release sites were identified from the 1988 Solid Waste Management Unit Report.
- RCRA Closure Plans have been submitted for seven closure tasks.
- Scoping and reconnaissance studies were conducted for 33 of 55 release sites.

D&D

- D&D is in progress on three reactors and one hot cell facility.

HEALTH RISKS

No immediate health risks have been identified based on information available to date; however, the risk associated with the waste sites at LANL cannot be quantified until a major portion of the characterization work is completed.

SPECIAL CONSIDERATIONS

RCRA waste resulting from ER Program activities may initially be shipped offsite until a RCRA-permitted mixed waste disposal facility at LANL is available for use.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
• RCRA 3004(u) Permit (March 1990) • Applicable State regulations • CERCLA • DOE Orders	• NMEID • EPA Region VI

MAJOR MILESTONES	CONTINUATION
• Complete 3 RCRA closures (FY 1990) • Start RFI/CMS assessments for 3 tasks in FY 1991 and 1 task in FY 1992 • Start 3 D&D tasks in FY 1990, 2 in FY 1991, 1 in FY 1992, and 1 in FY 1993 • Complete RFI/CMS assessments for 9 tasks in FY 1995 and 12 tasks in FY 1996 • Complete 4 D&D tasks in FY 1990, 1 in FY 1991, 2 in FY 1993, and 1 in FY 1994 • Start CMI remediations for 9 tasks in FY 1995	

FUNDING

Funding By Priority Level
(Thousands of Dollars)

Year	Priority 1		Priority 2		Priority 3		Priority 4		Total	
	A*	C**	A	C	A	C	A	C	A	C
FY90	0	983	10,895	4,265	0	0	0	0	10,895	5,248
FY91B	110	0	6,680	8,618	0	0	0	0	6,790	8,618
FY92	90	0	97,580	21,440	0	1,500	0	0	97,670	22,940
FY93	90	0	140,650	15,980	0	3,500	0	0	140,740	19,480
FY94	90	0	145,550	16,260	0	0	0	0	145,640	16,260
FY95	0	0	115,300	15,370	0	1,300	0	0	115,300	16,670
FY96	0	0	55,000	24,500	0	6,680	0	0	55,000	31,180
FY 92-96 TOT	270	0	554,080	93,550	0	12,980	0	0	554,350	106,530

A* Assessment C** Cleanup

Grand Total 660,880

ALBUQUERQUE OPERATIONS OFFICE
INSTALLATION SUMMARY - MOUND PLANT

Mound is located within the southern city limits of Miamisburg in southwestern Ohio. The plant site occupies 306 acres in a high area overlooking Miamisburg and the Great Miami river. The surrounding area is extensively urbanized, with the Dayton metropolitan area located about 10 miles north-northeast of the installation. Mound, an integrated research, development, and production facility, performs work in support of DOE weapons and energy programs, with emphasis on explosives and nuclear technology. The main function of the plant is the manufacture of nonnuclear and tritium-containing components for nuclear weapons.

EXTENT/TYPES OF CONTAMINATION

One hundred and eight potential release sites have been identified for further study; examples of contamination include:

- elevated levels of tritium in the groundwater, probably related to earlier liquid releases from operations;
- trace levels of chlorinated organics in the groundwater from solvents that either were used in high-explosives processing or were incidental to industrial operations;
- soils contaminated with thorium from past storage, handling, and repackaging activities;
- plutonium-contaminated soils onsite and deposition of plutonium-contaminated sediments offsite in the Miami-Erie Canal; and
- 12 inactive facilities that contain contaminated glovebox equipment and services, associated laboratory equipment, and structures (D&D).

STATUS

- Installation preliminary assessment completed (1987)
- Mound Site Survey Report completed (1988)
- Initial screening of seeps and pits conducted (1988)
- RI/FSs for most OUs initiated
- Decommissioning of surplus NE areas in R-Building completed and returned for reuse by DOE (FY 1990)

HEALTH RISKS

- No immediate health risks have been identified based on information available to date; however, steps must be taken within the next 5 years to prevent offsite contamination of groundwater.
- Primary concerns are VOCs and tritium contamination of the groundwater.
- The health risk associated with the waste sites at Mound cannot be quantified until a major portion of the characterization work associated with the RI is complete.

SPECIAL CONSIDERATIONS

- Mound is listed on the NPL.
- The Buried Valley Aquifer in the vicinity of Mound has been designated as a sole-source aquifer by EPA and as a Class I aquifer on a regional basis.

REGULATORY DRIVERS

Remedial Actions

- FFA and Consent Order being negotiated with EPA Region V (negotiations expected to be completed in early 1990)
- Findings and Order by Consent being negotiated with the State of Ohio
- RCRA Part B Permit application (currently under review by Ohio EPA)
- Applicable State of Ohio regulations
- DOE Orders

D&D

- MOU between OMA and Office of Terminal Waste Disposal and Remedial Action (NE 20) (signed in 1982)
- Applicable State of Ohio regulations
- DOE Orders

REGULATORY AUTHORITIES

- Ohio EPA
- EPA Region V

MAJOR MILESTONES

- Complete RI/FS work plans for three OUs (FY 1990)
- Complete assessment of surplus underground radioactive liquid waste transfer lines (FY 1991)
- Complete Advanced Nuclear Systems and Projects Division Areas decommissioning (FY 1991)
- Complete decommissioning of surplus areas of PP Building (FY 1991)
- Complete decommissioning of SW Cave surplus areas (FY 1991)
- Start cleanup on two OUs (FY 1992)
- Complete decommissioning of surplus areas of WD Building (FY 1993)
- Complete decommissioning of old SD plant (FY 1994)
- Complete RI/FS assessments on all nine OUs (FY 1995)
- Complete decommissioning of surplus areas in SW Building (FY 1995)
- Complete decommissioning of SM Building and surplus plant underground liquid waste transfer lines (FY 1996)

CONTINUATION

FUNDING

Funding By Priority Level
(Thousands of Dollars)

Year	Priority 1		Priority 2		Priority 3		Priority 4		Total	
	A*	C**	A	C	A	C	A	C	A	C
FY90	129	11,846	3,026	1,437	0	0	0	0	3,155	13,283
FY91B	568	15,079	6,910	0	0	0	500	0	7,978	15,079
FY92	284	15,360	18,739	9,838	0	3,713	0	0	19,023	28,911
FY93	106	10,499	6,382	24,544	0	3,351	0	0	6,488	38,394
FY94	46	9,325	4,180	45,275	0	1,105	0	0	4,226	55,705
FY95	0	8,384	2,618	52,807	0	440	0	0	2,618	61,631
FY96	0	2,498	1,223	47,196	870	0	0	0	2,093	49,694
FY 92-96 TOT	436	46,066	33,142	179,660	870	8,609	0	0	34,448	234,335

A* Assessment C** Cleanup

Grand Total 268,783

ALBUQUERQUE OPERATIONS OFFICE
INSTALLATION SUMMARY - PANTEX PLANT

Pantex is located in the Panhandle of Texas, about 17 miles northeast of downtown Amarillo and 10 miles west of the town of Panhandle. Pantex controls a total land area of about 16,000 acres. The total population within a 50-mile radius of the plant was 259,300 in 1980. The plant is operated to meet DOE's responsibilities for nuclear weapons assembly, stockpile monitoring, maintenance, modifications, and retirements (disassembly). Pantex conducts R&D on high explosives in support of weapons design and development and production engineering for DOE. Approximately 100 potential release sites have been identified at Pantex for investigation. Corrective Activities will be conducted beginning in FY 1990 under the terms of a RCRA Section 3008(h) Corrective Action Order on Consent.

EXTENT/TYPES OF CONTAMINATION

- The principal types of contamination identified requiring investigation and remediation are in facilities that may have managed hazardous waste and spill/release sites resulting from historical operations conducted in widespread areas of the facility.
- There are more than 20 former landfills that are not used as hazardous waste management facilities but that may have received hazardous materials during their operation.
- An onsite drainage system of unlined ditches and playa lakes has received Plant liquid effluent and rainfall runoffs over the history of the Plant. The ditches have received treated high-explosive wastewater effluents and, at times, various solvents used in high-explosive synthesis and formulation.
- Several areas of the Plant, the burning ground area and the firing sites in particular, also have been identified as having low-level radioactive contamination from past operational activities.
- Little is currently known about groundwater systems and contamination at Pantex. In FY 1990, routine monitoring identified low levels of suspected contamination in the Zone 12 Production Area in a perched water aquifer about 275 ft below the surface. The main aquifer (Ogallala) is about 450 ft below the surface.

STATUS

- In FY 1989, investigations proceeded on two gasoline leaks and the former chemical burn pit, and a RIR was released to regulatory agencies.
- Three Ogallala aquifer monitoring wells were installed downgradient of the former chemical burn pit.
- Additional planned work at the gasoline leaks was put on hold following receipt of a draft Section 3008(h) Corrective Action Order on Consent from EPA Region VI.
- All presently identified potential release sites have been incorporated into the Section 3008(h) Corrective Action Order on Consent negotiated with EPA Region VI in FY 1990.
- Schedules for investigation of these release sites have been specified in the Consent Order, but are subject to annual review and modification (with EPA approval).
- All assessment/remediation work at Pantex is now being restructured to the RCRA Corrective Action process.

HEALTH RISKS

No immediate health risks have been identified based on information available to date; however, very little is known about the extent and types of subsurface contamination. No offsite contamination resulting from past activities has been identified to date. Ogallala aquifer monitoring wells installed in FY 1990 between the former chemical burn pit and the Amarillo/Pantex water supply wells have been analyzed, and no hazardous constituents have been found. Perched groundwater contamination onsite was verified in FY 1990, but the extent of contamination is unknown due to lack of monitoring wells in Zone 12.

SPECIAL CONSIDERATIONS

Very little information is currently available about the extent of subsurface contamination at Pantex. The schedules negotiated in the Section 3008(h) Corrective Action Order on Consent are based on limited knowledge of actual remedial action that may be required. Schedules and remedial action work are expected to require adjustments as investigations are conducted, and the Section 3008(h) Corrective Action Order on Consent allows annual readjustment based on program experience and funding limitations.

The Texas Water Commission is currently drafting Corrective Action Permit provisions for Pantex under RCRA. The schedules and requirements in the Corrective Action Order on Consent are expected to "roll over" into the state RCRA Permit, though this process is subject to negotiation with the State.

REGULATORY DRIVERS

- Section RCRA 3008(h) Corrective Action Order on Consent with EPA Region VI
- RCRA [the Texas Water Commission is expected to draft a Corrective Action permit in FY 1990, using the schedules and release sites in the Section 3008(h) Corrective Action Order on Consent]
- DOE Orders

REGULATORY AUTHORITIES

- Texas Water Commission
- EPA Region VI

MAJOR MILESTONES

- Complete four RCRA Facility Investigation Work Plans (FY 1990)
- Complete six RCRA Facility Investigation Work Plans (FY 1991)
- Complete one RCRA Facility Investigation Report (FY 1991)
- Complete eight RCRA Facility Investigation Reports (FY 1992)
- Complete six CMSs (FY 1993)
- Complete three CMSs (FY 1994)
- Complete three CMSs (FY 1995)

CONTINUATION

FUNDING

Funding By Priority Level
(Thousands of Dollars)

Year	Priority 1		Priority 2		Priority 3		Priority 4		Total	
	A*	C**	A	C	A	C	A	C	A	C
FY90	0	0	2,753	0	197	0	0	0	2,950	0
FY91B	46	0	8,468	714	200	0	0	0	8,714	714
FY92	46	0	7,940	2,720	150	0	0	0	8,136	2,720
FY93	46	0	5,060	6,120	150	0	0	0	5,256	6,120
FY94	46	0	2,410	9,810	0	0	0	0	2,456	9,810
FY95	46	0	1,430	10,560	450	0	0	0	1,926	10,560
FY96	46	0	600	11,770	150	0	0	0	796	11,770
FY 92-96 TOT	230	0	17,440	40,980	900	0	0	0	18,570	40,980
									Grand Total	59,550

A*Assessment C**Cleanup

ALBUQUERQUE OPERATIONS OFFICE
INSTALLATION SUMMARY - PINELLAS PLANT

Pinellas is located on a 99.2-acre site about 6 miles north of St. Petersburg in Pinellas County, Florida. Pinellas County is on a peninsula bordered on the west by the Gulf of Mexico and on the east and south by Tampa Bay. The 1988 census estimated a population of 839,891 in Pinellas County. Key activities at Pinellas include design, development, and production of special electronic and mechanical equipment for nuclear weapon applications. Such specialized products include neutron generators, radioisotope thermoelectric generators, specialty capacitors, thermal batteries and crystal resonators, oscillators, and clocks.

EXTENT/TYPES OF CONTAMINATION

There is contaminated groundwater with a mechanism for offsite transport via an underlying groundwater system. The extent and types of contamination have not been fully defined. Fourteen SWMUs have been identified at the site by EPA Region IV. They will be assessed and remediated under RCRA. One site, adjacent to the Plant, will be remediated as a CERCLA site. The 4.5-acre site is property that was formerly owned by DOE and is now owned by a private individual.

STATUS

- Installation assessment completed (1987)
- Technical Assistance Reports prepared for two sites
- RI plans prepared for two sites
- Interim remedial actions for 4.5-acre site started (1990)
- HSWA Permit issued by EPA Region IV (February 1990)

HEALTH RISKS

No immediate health risks have been identified based on information available to date; however, the risks cannot be quantified until a major portion of the characterization work associated with the RFI is complete.

SPECIAL CONSIDERATIONS

- Although Pinellas is not expected to be listed on the NPL, the site contractor is a PRP for the Peak Oil Site. (Pinellas shipped small quantities of waste for disposal at Peak; DOE's share in responsibility is less than 1 percent.)
- The 4.5-acre site is not on Federal property (previously sold by General Services Administration).

REGULATORY DRIVERS

- RCRA 3004(u) provisions of Part B Permit application
- FDER to handle the 4.5-acre site rather than RCRA 3004(u)
- Applicable State regulations
- DOE Orders

REGULATORY AUTHORITIES

- FDER
- EPA Region IV

MAJOR MILESTONES

- Initiate assessment of the 14 SWMUs as required by the Site HSWA Permit from EPA Region IV (FY 1990)
- Start interim remedial action for 4.5-acre site (FY 1990)
- Initiate assessment activity for 4.5-acre site (FY 1991)
- Initiate assessment of Floridian Aquifer (FY 1992)
- Complete assessment of 4.5-acre site (FY 1992)
- Continue assessment of Floridian Aquifer (FY 1993)
- Start remedial action of Floridian Aquifer (FY 1994)

CONTINUATION

FUNDING

Funding By Priority Level
(Thousands of Dollars)

Year	Priority 1		Priority 2		Priority 3		Priority 4		Total	
	A*	C**	A	C	A	C	A	C	A	C
FY90	222	467	830	88	0	0	0	0	1,052	555
FY91B	1,230	300	920	242	0	0	0	0	2,150	542
FY92	825	369	615	1,230	0	0	0	0	1,440	1,599
FY93	443	430	554	1,845	0	0	0	0	997	2,275
FY94	185	861	545	2,952	0	1,845	0	0	730	5,658
FY95	185	922	369	2,583	0	2,460	0	0	554	5,965
FY96	185	984	369	2,214	0	3,690	0	0	554	6,888
FY 92-96 TOT	1,823	3,566	2,452	10,824	0	7,995	0	0	4,275	22,385

A* Assessment C** Cleanup

Grand Total 26,660

ALBUQUERQUE OPERATIONS OFFICE
INSTALLATION SUMMARY - SANDIA NATIONAL LABORATORIES-ALBUQUERQUE

SNLA occupies several parcels of land covering 2,820 acres within Kirtland AFB in Albuquerque. SNLA is an R&D laboratory primarily dedicated to the design and testing of nonnuclear components of nuclear weapons. Sandia also has responsibility for two offsite areas: the TTR and Kauai Test Range. TTR covers 640 square miles in the high desert region of west central Nevada, approximately 140 air miles northwest of Las Vegas. TTR was used as a bombing range throughout World War II. The Kauai Test Range is located on the island of Kauai within the Navy-owned Pacific Missile Range Facility. The facility is used for launching missiles over the Pacific Ocean to remote target areas.

EXTENT/TYPES OF CONTAMINATION

SNLA
The Installation Assessment identified 20 tasks containing 139 potential release sites. These potential release sites include shallow land burial sites, test areas, drainfields, and historic spill sites. Contaminants include a wide variety of hazardous and radioactive wastes, explosive residues, solvents, photochemicals, and petroleum products. Few of the sites have been characterized to date; however, the potential (unverified) for TCE groundwater contamination has been identified.

Tonopah Test Range
The Preliminary Assessment identified 3 tasks containing 15 potential release sites. These potential release sites include shallow land burial sites, test areas, drainfields, and historic spill sites. Contaminants include a limited group of hazardous and radioactive wastes, explosive and rocket propellant residues, solvents, photochemicals, and petroleum products. Few of the sites have been characterized to date; however, it is estimated that the extent of contamination is limited to surface and subsurface soils.

(Continued)

STATUS

Assessment
At SNLA the Environmental Restoration program has begun RCRA Facility Investigations of 6 tasks that contain 30 potential release sites. Groundwater detection monitoring networks have been installed at the shallow land burial sites. A closure plan was submitted to the NMEID for approval of a cap at the Chemical Waste Landfill and has not yet been reviewed. Closure cannot begin until approval is secured, and this project may be delayed until FY 1991. The assessment phase of the program was developed as a two-stage process. The first stage will confirm or reject the status of a potential release site. The second stage will sufficiently characterize a release to support a CMS.

Remediation
At SNLA the installation of a multicomponent RCRA cap is planned for the Chemical Waste Landfill after design approval is obtained from NMEID.

HEALTH RISKS

No immediate health risks have been identified based on information available to date; however, the risk associated with the release sites at SNLA cannot be quantified until a major portion of the characterization work performed during the RCRA Facility Investigations has been completed.

SPECIAL CONSIDERATIONS

The release sites at SNLA and TTR are located in alluvial materials at large distances from the groundwater. In these arid climates, driving forces to cause movement of contaminants to a receptor are weak; however, the technology to demonstrate low migration potential and minimal risk if the contamination is left in place is also weak. Technical risk evaluations and cost/benefit evaluations will be necessary to propose corrective measures that meet the regulatory requirements.

REGULATORY DRIVERS

SNLA
- RCRA 3004(u) Corrective Action for releases from SWMUs
- Postclosure permit for closed landfills
- RCRA Closure for regulated landfills
- RCRA Part B Operating Permit with HSWA provisions of SWMUs (expected in Fall 1990)
- DOE Orders

TTR and Kauai
- CERCLA, Non-NPL
- Applicable State regulations
- DOE Orders

REGULATORY AUTHORITIES

- NMEID
- EPA Region VI
- EPA Region IX

MAJOR MILESTONES

SNLA
- Complete two-stage assessment process in 4 years for each task
- Complete Chemical Waste Landfill cap (FY 1990)
- Complete requirements of the NMEID Compliance Agreement for the Chemical Waste Landfill (FY 1991)
- Complete 1 assessment in FY 1991, 1 assessment in FY 1992, 3 assessments in FY 1993, 4 assessments in FY 1994, 7 assessments in FY 1995, 1 assessment in FY 1996, and 4 assessments in outyears. Remediation milestones dependent on assessment results

CONTINUATION

Extent/Types of Contamination (Continued)

Kauai Test Facility
The Preliminary Assessment identified one task containing three potential release sites. These potential release sites include rocket propellant residues, a drainfield, and historic spills. Contaminants are limited to hazardous constituents and petroleum products.

FUNDING

Funding By Priority Level
(Thousands of Dollars)

Year	Priority 1		Priority 2		Priority 3		Priority 4		Total	
	A*	C**	A	C	A	C	A	C	A	C
FY90	0	0	2,272	1,735	0	0	67	0	2,339	1,735
FY91B	27	0	3,704	0	45	0	576	0	4,352	0
FY92	32	0	9,761	1,943	755	0	503	0	11,051	1,943
FY93	32	0	9,306	4,435	205	0	705	0	10,248	4,435
FY94	32	0	7,495	3,879	205	0	3,669	0	11,401	3,879
FY95	32	0	4,047	2,142	205	0	2,645	0	6,929	2,142
FY96	32	0	3,132	1,740	205	0	2,530	0	5,899	1,740
FY 92-96 TOT	160	0	33,741	14,139	1,575	0	10,052	0	45,528	14,139

A* Assessment C** Cleanup

Grand Total 59,667

ALBUQUERQUE OPERATIONS OFFICE
INSTALLATION SUMMARY - SANDIA NATIONAL LABORATORIES-LIVERMORE

SNLL lies about 40 miles east of San Francisco in the Livermore Valley, approximately 3 miles east of the Livermore city center. SNLL occupies about 413 acres of land only a few blocks from the edge of the City of Livermore. In 1988 the population within 50 miles was estimated at nearly 6,000,000. SNLL consists of R&D laboratories dedicated to the design and testing of nonnuclear components of nuclear weapons systems. A significant fraction of R&D at SNLL is devoted to energy-related programs in the Combustion Research Facility.

EXTENT/TYPES OF CONTAMINATION

- In 1984, CEARP identified two sites with contamination or potential contamination: NLF and a 59,000-gal diesel FOS, which happened in 1974.
- In 1987, DOE acquired the Trudell Auto Repair Service Station (Trudell Site), with known waste oil contamination, as part of the security buffer zone around SNLL.
- The contaminant of most concern at SNLL is the benzene found at the FOS site. Benzene, a component of diesel fuel, has been identified in a few groundwater analyses at levels of 3.5 ppb and less. The contaminated soils at the FOS must be remediated to protect the public and the environment. The soils at the Trudell Site contain both lead and waste oils and must be removed. To date, no hazardous wastes have been identified at NLF.

STATUS

NLF:

- Assessment Phase activities completed (FY 1989)
- SWAT 1 year monitoring phase ongoing
- Three new monitoring wells, two lysimeters, one piezometer used in year-long testing
- SWAT report to be written (FY 1990)
- Extensive remediation under the SWAT program possibly required by California RWQCB

FOS:

- Assessment Phase activities completed (FY 1989)
- SNLL/LANL developed pre-FS plan to evaluate cleanup standards/certain remedial methods
- Bench-Scale Treatability Study done by ANL and the University of Notre Dame
- INEL to provide technical oversight

(Continued)

HEALTH RISKS

- A full assessment for the benzene at the FOS site was incorporated in the FOS RIR. Benzene, a known carcinogen, presents a health risk to persons ingesting the groundwater from this site. However, the aquifer is not used as a source of drinking water for either humans or animals, nor is it used for irrigation.
- The lead in the soils at Trudell could possibly present a risk to persons or animals ingesting the soils; however, access to the site is controlled by a security fence and 24-hour patrols.
- Risk at NLF is believed to be insignificant.

SPECIAL CONSIDERATIONS

Conditions at the FOS do not lend themselves to an obvious remedial action, and innovative technologies such as in situ bioremediation are being considered. To determine required cleanup standards for the FOS and to best utilize the ER funding, a Bench-Scale Treatability Study has been developed. This study is being implemented in FY 1990. Cores were taken, and a cleanup standard will be developed by ANL and the University of Notre Dame.

Other factors that could cause a change in the ER program effort, funding, or manpower requirements would be additional requirements resulting from the Tiger Team assessment and new NEPA requirements.

REGULATORY DRIVERS

- California RWQCB Order 88-142 final schedule for the ER activities, including the FOS, the Trudell Site, and the NLF (under the SWAT program) (1988). (In 1989, California RWQCB Order 89-184 modified this schedule to allow one additional year for a pre-FS Bench-Scale Study for the FOS)
- California SWAT
- California Waste Code
- California Code of Regulations, Title 26, Toxics
- RCRA
- CERCLA
- DOE Orders

REGULATORY AUTHORITIES

- California RWQCB
- Local, county, and State regulatory authorities
- EPA Region IX

MAJOR MILESTONES

Assessment Phase:
- Submit NLF SWAT Report (FY 1990)
- Obtain approval of Bench-Scale Treatability Study Work Plan (FY 1990)
- Pull BSTS cores (FY 1990)
- Complete BSTS (FY 1990)
- Submit FOS FS to California RWQCB (FY 1990)
- Submit BSTS Final Report, SNLL (FY 1991)

Remediation Phase:
- Submit Trudell RD to California RWQCB (FY 1990)
- Complete Trudell RA (FY 1991)
- Submit Trudell Compliance Verification Monitoring Report to California RWQCB (FY 1991)
- Complete FOS RD (FY 1991)
- Submit Interim Status Reports (4Q FY 1991-1994)
- Submit Interim Status Reports (4Q FY 1992-1995)
- Complete NLF RA (FY 1995)
- Complete FOS RA (FY 1997)

CONTINUATION

(continuation of status)
Trudell Site:
- Assessment Phase completed (FY 1989)
- RIR submitted to California RWQCB (4Q FY 1989)
- RIR approved by California RWQCB (1Q FY 1990)
- California RWQCB directed excavation of the site as interim cleanup measure (1Q FY 1990)

FUNDING

Funding By Priority Level
(Thousands of Dollars)

Year	Priority 1		Priority 2		Priority 3		Priority 4		Total	
	A*	C**	A	C	A	C	A	C	A	C
FY90	442	0	256	173	148	0	0	0	846	173
FY91B	0	1,126	0	130	0	0	0	0	0	1,256
FY92	0	3,655	599	4,129	1,500	0	0	0	2,099	7,784
FY93	0	1,029	223	4,263	12	0	0	0	235	5,292
FY94	0	1,029	0	4,263	12	0	0	0	12	5,292
FY95	0	1,029	0	0	12	0	0	0	12	1,029
FY96	0	1,029	0	0	12	0	0	0	12	1,029
FY 92-96 TOT	0	7,771	822	12,655	1,548	0	0	0	2,370	20,426

A* Assessment C** Cleanup

Grand Total 22,796

ALBUQUERQUE OPERATIONS OFFICE
INSTALLATION SUMMARY - SOUTH VALLEY SITE

From 1951 to 1967, the AEC operated a metal-working plant associated with weapons production in the South Valley of Albuquerque, approximately 2 miles west of Kirtland AFB. The Air Force bought the plant in 1967 and produced jet engines from then until 1984 when GE bought the plant. The site includes two separate units--the GE Plant and the nearby San Jose 6 Municipal well. Discovery of solvent contamination of the municipal well in 1980 led to the designation of the South Valley Superfund site in 1983. As a former owner (as AEC), DOE is liable for its share of the cleanup.

EXTENT/TYPES OF CONTAMINATION

- VOCs are present in groundwater and soil.
- The vertical and lateral extent of VOC contamination in the groundwater is not fully known.
- It is not known if there is metal contamination.
- Cleanup standards for VOCs are yet to be negotiated.

STATUS

- The RI/FS was completed in 1988, and EPA issued RODs for cleanup.
- DOE, the Air Force, and GE attempted to negotiate an agreement to fund the EPA-selected remedies. Due to failure to reach agreement after 6 months, EPA issued CERCLA 106 Unilateral Orders against GE to implement the remedies.
- GE is currently implementing RAs.
- GE submitted a Remedial Action Plan to EPA in late 1989.
- GE is negotiating an RD/RA schedule with EPA Region VI.
- GE, the Air Force, DOE, and DOJ are negotiating a settlement agreement to reimburse GE.
- The Air Force and DOE are negotiating an IAG to transfer DOE's share of the cleanup money to the Air Force. The Air Force will reimburse GE for the Federal government.

HEALTH RISKS

Contamination of the underlying aquifer with solvents is a potential health risk.

SPECIAL CONSIDERATIONS

- The contaminated site is private (GE) property.
- As a PRP and previous facility owner, DOE is required by statute and regulation to cover its fair share of response action costs at the South Valley Superfund site. Negotiations with DOJ, the Air Force, and GE defining how this should be done are nearing completion.

REGULATORY DRIVERS

- CERCLA 106 Unilateral Cleanup Orders issued against GE in July 1989
- EPA special notice letters that identified DOE, the Air Force, and GE as PRPs liable for cleanup activities at GE and the San Jose 6 OUs
- Applicable State regulations
- DOE Orders

REGULATORY AUTHORITIES

- NMEID
- EPA Region VI

MAJOR MILESTONES

- Start RD/RA (FY 1990)
- Complete RD/RA (FY 2003 for GE plant - 2019 for San Jose)
  (RD/RA schedule is under negotiation. Further detail is not available at this time.)

CONTINUATION

FUNDING

Funding By Priority Level
(Thousands of Dollars)

Year	Priority 1 A*	Priority 1 C**	Priority 2 A	Priority 2 C	Priority 3 A	Priority 3 C	Priority 4 A	Priority 4 C	Total A	Total C
FY90	0	0	0	0	0	1,300	0	0	0	1,300
FY91B	0	0	0	0	0	3,000	0	0	0	3,000
FY92	0	0	0	0	0	2,064	0	0	0	2,064
FY93	0	0	0	0	0	872	0	0	0	872
FY94	0	0	0	0	0	872	0	0	0	872
FY95	0	0	0	0	0	872	0	0	0	872
FY96	0	0	0	0	0	872	0	0	0	872
FY 92-96 TOT	0	0	0	0	0	5,552	0	0	0	5,552

A* Assessment C** Cleanup

Grand Total 5,552

ALBUQUERQUE OPERATIONS OFFICE
INSTALLATION SUMMARY - URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT

In 1978, the Congress passed the Uranium Mill Tailings Radiation Control Act (Public Law 95-604), which directed DOE to provide for stabilization and control of the uranium mill tailings from inactive sites in a safe and environmentally sound manner. The sandlike tailings, located at 24 sites and associated vicinity properties, are the result of uranium production from the early 1950s until the early 1970s. Compliance with proposed EPA UMTRA standards will require restoration of groundwater at some tailings sites. Activities described include only the UMTRA sites managed by AL. Additional UMTRA activities are being conducted by other Operations Offices.

EXTENT/TYPES OF CONTAMINATION

- Twenty-four sites in 10 States (4 of which are on Indian reservations) consisting of one or more piles of tailings and abandoned mill buildings
- Approximately 5000 vicinity properties, tailings used for construction and landscaping before recognition of the potential hazards, and open lands contaminated by windblown tailings from sites
- 30 million cubic yards of tailings
- Emanation of radon gas from decay of radium-226, (radon-222, polonium-218, and 214)
- Gamma radiation decay products (lead-214, bismuth-214)
- RCRA-listed hazardous constituents in groundwater plus molybedum, radium, uranium, selenium, and nitrates
- Asbestos and other hazardous and mixed organic wastes at abandoned millsites

STATUS

- Remediation was completed at 4 of 24 sites before FY 1990. Two of these were completed in 1989. The commitment of three sites was missed by one site, which was completed in FY 1990.
- Through FY 1989, remediation has been completed at more than 3,500 of 5,000 vicinity properties, over 4,000 of which are the responsibility of ID. Remediation was completed at 769 vicinity properties in 1989, which is greater than the commitment of 720 properties.
- One additional site was completed during the first quarter of FY 1990, with two more projected to be completed by the end of the year. To date (FY 1990), 255 of the scheduled 721 vicinity properties have been remediated.
- Engineering and NEPA documentation are under way on all remaining sites.

HEALTH RISKS

- Unstabilized piles will continue to emanate radon gas and allow dispersal of windblown contamination.
- Unremediated vicinity properties will expose occupants of residential and commercial structures to unacceptable levels of radon gas.
- Unstabilized tailings piles will continue to contaminate groundwater through infiltration of water.

SPECIAL CONSIDERATIONS

Shared State/DOE Funding
Site acquisition, engineering, and remedial action costs are shared: DOE 90 percent and States 10 percent. DOE pays all costs for the four sites on Indian land. In addition, DOE pays all other project costs such as project management and control, NEPA documentation, conceptual design, and S&M.

Groundwater Restoration
Compliance with UMTRA standards promulgated by EPA in 1983 did not require groundwater restoration. Following a court remand in 1985, EPA proposed revised groundwater standards in 1987. Compliance with these revised standards, not yet finalized, will require groundwater characterization at all 24 UMTRA sites and groundwater restoration at some of those sites. Restoration will be performed under a new, separate DOE project.

REGULATORY DRIVERS

- PL 95-604 Uranium Mill Tailings Radiation Control Act
- 40 CFR 192
- PL 100-616
- Applicable State regulations
- PL 95-415
- RCRA
- DOE Orders

REGULATORY AUTHORITIES

- Affected States Department of Health
- NRC
- EPA
- DOI

MAJOR MILESTONES

- Complete NEPA documentation at four additional sites, with the four remaining sites rescheduled for completion during FY 1991 (FY 1990)
- Complete site engineering at two additional sites, with the five remaining sites rescheduled for completion in FY 1991 (FY 1990)
- Complete remediation at 721 additional vicinity properties and 4 additional sites (including 1 delayed from FY 1989), with 8 sites due to be under construction by the end of FY 1990 (of the 9 sites previously planned, 2 construction starts have been delayed until FY 1991 and 1 site scheduled to be completed in FY 1989 was completed in FY 1990) (FY 1990)
- Complete remediation at 510 additional vicinity properties and 1 additional site (which had initially been scheduled to be completed in FY 1990), resume remediation at 4 sites, and have 8 sites under construction (end of FY 1991)
- Complete all remaining UMTRA surface NEPA documentation and site engineering (FY 1991)

(Continued)

CONTINUATION

Major Milestones (Continued)

- Complete UMTRA surface remediation at 3 additional sites and 81 additional vicinity properties and have 10 sites under construction (end of FY 1992)
- Complete UMTRA surface remediation at 4 additional sites and at all remaining vicinity properties for a total of 5,048 and have 8 sites under construction (end of FY 1993)
- Complete UMTRA surface remediation at remaining 8 sites (FY 1994)
- Complete surface postremediation assessment at all remaining UMTRA sites (FY 1995)
- Complete UMTRA groundwater technology development at 1 site (FY 1995)
- Complete UMTRA groundwater technology development at 3 additional sites (FY 1996)
- Complete preremediation UMTRA groundwater assessment at 2 sites (FY 1996)

FUNDING

Funding By Priority Level
(Thousands of Dollars)

Year	Priority 1		Priority 2		Priority 3		Priority 4		Total	
	A*	C**	A	C	A	C	A	C	A	C
FY90	27,544	33,960	0	0	0	0	0	0	27,544	33,960
FY91B	24,310	70,935	0	1,000	0	0	0	0	24,310	71,935
FY92	24,038	93,585	0	4,000	0	0	0	0	24,038	97,585
FY93	29,065	104,245	0	10,000	0	0	0	0	29,065	114,245
FY94	19,093	23,275	0	28,000	0	0	0	0	19,093	51,275
FY95	9,465	0	0	35,000	0	0	0	0	9,465	35,000
FY96	0	0	0	35,000	0	0	0	0	0	35,000
FY 92-96 TOTAL	81,661	221,105	0	112,000	0	0	0	0	81,661	333,105
									Grand Total	414,766

A*Assessment C**Cleanup

CHICAGO OPERATIONS OFFICE
INSTALLATION SUMMARY - ARGONNE NATIONAL LABORATORY-EAST

ANL-E occupies a 1700-acre tract located approximately 22 miles southwest of downtown Chicago, in DuPage County, Illinois. ANL-E is a multidisciplinary R&D laboratory that conducts both basic and applied research in a variety of fields of interest to DOE, other agencies, and the public.

EXTENT/TYPES OF CONTAMINATION

- Soils contaminated with hazardous metals, organic and inorganic chemicals, coal pile runoff, radioactive contaminants, and lime sludge
- Contaminated reactor system components, hot cells, and experimental apparatus
- Groundwater contaminated with tritium, strontium-90, and cesium-137
- Soils contaminated with PCBs
- Pitchblende-contaminated soil (NBL-NJ)

STATUS

- Waste characterization is in progress, additional investigations are planned, and remediation will be conducted as needed.
- Hydrogeological characterization is in progress, and additional investigations are planned.
- Assessments are in progress, and S&M activities are ongoing.
- Assessments are under way; S&M of inactive reactor facility, hot cells, and radioactive materials burial site is in progress.
- D&D of EBWR and CP-5 reactor is under way.
- Other D&D project planning activities are in progress.
- Technical assistance in developing and/or reviewing criteria, standards, and requirements; computer codes analysis; and implementation policies for HQ ER&WM activities in FUSRAP and SFMP are ongoing.
- Removal of EBWR systems/components is not completed.

HEALTH RISKS

- Contamination of the underlying aquifer with organic, inorganic, and radioactive contaminants exists.
- Potential release of radioactive contamination from deteriorating containment building containing highly contaminated components and structures exists.
- Potential release of radiological and chemical contaminants to the offsite surface drainage system exists.

SPECIAL CONSIDERATIONS

- Delay in addressing potential groundwater contamination could cause modification of the RCRA Permit and enforcement action by the Illinois EPA.
- Interim D&D effort at the CP-5 Reactor will eliminate the major source of tritium release and the potential for radioactive releases to groundwater.
- NBL-NJ Decommissioning Project is a docketed site for cleanup under EPA and is subject to DOE Orders.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
• Applicable State Regulations (Illinois and New Jersey) • RCRA • CERCLA • TSCA • CWA	• Illinois EPA • NJDEP • EPA Region II (NBL-NJ) • EPA Region V (ANL-E)

MAJOR MILESTONES	CONTINUATION
• Complete annual environmental radiological S&M activities and issue report for ANL-E surplus facilities and NBL-NJ property (FY 1990) • Complete ANL-E EBWR reactor vessel removal (FY 1992); complete bioshield decontamination, miscellaneous decontamination, cleanup, and project closeout (FY 1994) • Complete removal of pitchblende-contaminated soil, NBL-NJ (FY 1992)	

FUNDING

Funding By Priority Level
(Thousands of Dollars)

Year	Priority 1		Priority 2		Priority 3		Priority 4		Total	
	A*	C**	A	C	A	C	A	C	A	C
FY90	3,399	2,531	0	0	33	0	0	0	3,432	2,531
FY91B	3,826	7,656	0	3,570	23	16	0	0	3,849	11,242
FY92	4,175	9,407	50	3,570	250	0	0	0	4,475	12,977
FY93	4,030	14,610	53	0	0	3,800	0	0	4,083	18,410
FY94	2,038	14,614	55	0	0	0	0	250	2,093	14,864
FY95	2,045	8,668	58	0	0	0	0	2,800	2,103	11,468
FY96	2,040	8,900	61	0	0	0	0	0	2,101	8,900
FY 92-96 TOT	14,328	56,199	277	3,570	250	3,800	0	3,050	14,855	66,619

A* Assessment C** Cleanup

Grand Total 81,474

CHICAGO OPERATIONS OFFICE
INSTALLATION SUMMARY - ARGONNE NATIONAL LABORATORY-WEST

ANL-W is located on the southeastern portion of INEL near Idaho Falls, Idaho. The primary mission is R&D in support of the nation's fast reactor program. Reactor complexes at ANL-W include the Experimental Breeder Reactor No. 2, the Transient Reactor Test Facility, and the Zero Power Physics Reactor.

EXTENT/TYPES OF CONTAMINATION	STATUS
• Radioactively contaminated soils • Fuel oil spills • Radioactively contaminated piping and equipment	Hydrogeological and waste characterization is in progress; additional assessment and characterization work is planned.

HEALTH RISKS	SPECIAL CONSIDERATIONS
Potential exists for contamination of the underlying Snake River aquifer.	• Delay of activities dictated by COCA must have prior approval of EPA Region X. • The State of Idaho is well appraised of the COCA activities.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
• Applicable State regulations • INEL COCA between DOE and EPA • RCRA • CERCLA • CERCLA FFA (pending)	• State of Idaho • EPA Region X

MAJOR MILESTONES	CONTINUATION
• Complete D&D of Central Liquid Waste Processing Area (FY 1992) • Submit last of a series of Monitoring/Analysis/Testing Plans for COCA activities (FY 1993)	

FUNDING

Funding By Priority Level
(Thousands of Dollars)

Year	Priority 1		Priority 2		Priority 3		Priority 4		Total	
	A*	C**	A	C	A	C	A	C	A	C
FY90	0	0	0	0	0	0	0	0	0	0
FY91B	210	0	0	0	0	0	0	0	210	0
FY92	449	0	0	0	0	1,788	0	0	449	1,788
FY93	295	0	0	0	0	0	0	0	295	0
FY94	268	0	0	0	0	0	0	0	268	0
FY95	268	0	0	0	0	0	0	0	268	0
FY96	268	0	0	0	0	0	0	0	268	0
FY 92-96 TOT	1,548	0	0	0	0	1,788	0	0	1,548	1,788

A* Assessment C** Cleanup

Grand Total: 3,336

CHICAGO OPERATIONS OFFICE
INSTALLATION SUMMARY - BROOKHAVEN NATIONAL LABORATORY

BNL is a multiprogram R&D laboratory located in central Suffolk County of Long Island about 60 miles east of New York City. The site consists of 8.2 square miles, most of which is wooded, except for a developed area of about 2.6 square miles. The Laboratory is situated over an EPA-designated, sole-source drinking water aquifer.

EXTENT/TYPES OF CONTAMINATION	STATUS
• Contaminated reactor system components, hot cells, and experimental apparatus • Oil-contaminated soil and contaminated sludge • Groundwater contaminated with solvents, tritium, and strontium-90	• Waste characterization is in progress, and additional investigations are planned. • Hydrogeological monitoring and characterization is in progress, and remediation projects have been proposed. • Installation of sitewide groundwater monitoring program is in progress. D&D of waste tanks, soil sampling, analysis efforts, and remediation projects to mitigate groundwater contamination have been proposed. • Characterization and remedial activities will be planned in accordance with the three-party IAG being negotiated with DOE, EPA, and the State. • Support to UMTRA is ongoing.

HEALTH RISKS	SPECIAL CONSIDERATIONS
• Potential exists for release of radioactive contamination from deteriorating containment building containing highly contaminated components and structures. • Contamination of underlying sole-source aquifer from sources onsite is possible based upon currently available information.	• The facility is located over a designated sole-source aquifer. • Site was added to NPL December 21, 1989.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
• Applicable State regulations • New York State law regarding waste landfill closures by 1990 • Tri-Party Agreement to be finalized and signed by DOE, EPA, and New York State • Joint BNL-Suffolk County Agreement signed in 1987 • RCRA • CERCLA • CWA	• Suffolk County • New York State • EPA Region II

MAJOR MILESTONES	CONTINUATION
• Complete disposal of waste tank sludge (FY 1990) • Complete shipment of low-level shielding debris from closed landfills (FY 1990) • Complete installation of 26 groundwater monitoring wells (FY 1991) • Complete D&D and dismantlement of waste tanks and dispose of waste materials (FY 1991) • Complete cost-effectiveness studies for four UMTRAs (FY 1991) • Complete construction and installation of landfill impermeable caps (FY 1992) • Demonstrate applicability of the performance assessment reliability analysis methodology (FY 1993) • Complete initial site RI/FS (FY 1994)	

FUNDING

Funding By Priority Level
(Thousands of Dollars)

Year	Priority 1		Priority 2		Priority 3		Priority 4		Total	
	A*	C**	A	C	A	C	A	C	A	C
FY90	0	3,216	493	0	200	0	0	0	693	3,216
FY91B	0	3,000	4,155	0	300	0	0	0	4,455	3,000
FY92	0	1,838	2,367	0	500	0	0	0	2,867	1,838
FY93	0	0	363	1,500	250	0	0	1,000	613	2,500
FY94	0	0	55	2,000	0	0	0	8,800	55	10,800
FY95	0	0	58	1,000	452	0	0	9,000	510	10,000
FY96	0	0	61	0	0	0	0	0	61	0
FY 92-96 TOT	0	1,838	2,904	4,500	1,202	0	0	18,800	4,106	25,138

A* Assessment C** Cleanup

Grand Total 29,244

CHICAGO OPERATIONS OFFICE
INSTALLATIONS SUMMARY - COMBINED LABORATORIES

BCL, located in Columbus, Ohio, is a not-for-profit multidisciplinary enterprise performing applied research for commercial and Government customers. For 40 years, BCL conducted research for DOE and its predecessor agencies in the areas of nuclear materials fabrication and handling. PNPF, located in Piqua, Ohio, is a decommissioned demonstration power reactor. The facility was operated between 1963 and 1966 and was decommissioned and retired in 1969. HNPF, located near Hallam, Nebraska, is a decommissioned demonstration power reactor. The facility was operated between 1962 and 1964 and was decommissioned and retired in 1969.

EXTENT/TYPES OF CONTAMINATION

- Contaminated reactor system components, hot cells, and experimental apparatus (BCL)
- Spent fuel pool contaminated water (BCL)
- Small amount of limited concentrations of radioactive sludge in reactor building sump (PNPF)

STATUS

- S&M activities are in progress (BCL, PNPF, and HNPF).
- D&D of facilities is ongoing (BCL).
- Hydrogeological and waste characterization is in progress (BCL).
- Project work plans for installation of groundwater monitoring wells are under review (HNPF).
- D&D was initiated at King and West Jefferson Streets sites (BCL).

HEALTH RISKS

Potential exists for release of radioactive contamination from deteriorating containment building containing highly contaminated components and structures (BCL).

SPECIAL CONSIDERATIONS

- The land and facilities are privately owned by Battelle Memorial Institute (BCL).
- The land and facilities are owned by the Nebraska Public Power District and leased to DOE (HNPF).
- Per the property lease agreement between the City of Piqua and DOE, ownership of property transfers to the City of Piqua in FY 2019 (PNPF).
- The City of Piqua Municipal Power Systems Department uses the containment building as an electric distribution warehouse and office complex (PNPF).

REGULATORY DRIVERS	REGULATORY AUTHORITIES
· Applicable State regulations (Ohio and Nebraska) · NRC License requirements (BCL)	· Ohio EPA (BCL, PNPF) · EPA Region V (BCL, PNPF) · EPA Region VII (HNPF) · Nebraska Department of Health (HNPF) · NRC Region III (BCL)

MAJOR MILESTONES	CONTINUATION
· Complete annual environmental radiological S&M activities and issue report for HNPF, PNPF, and BCL surplus facilities (FY 1990) · Complete BCL NEPA documentation (FY1990) · Complete D&D of three buildings (JS-1, JS-10, JS-12), West Jefferson Site, BCL (FY 1990) · Complete facilities assessment and characterization, BCL (FY 1991) · Complete disposal of hot cell spent fuel pool contaminated water, West Jefferson Site, BCL (FY 1991) · Complete D&D of Building 2 (FY 1991), Building 6 (FY 1992), Buildings 1 and 3 (FY 1993), Buildings 4 and 5 (FY 1994), Building 7 (FY 1995), Building 9 (FY 1997), and Building A (FY 1998), King Avenue Site, BCL · Complete D&D of Building JN-2, West Jefferson Site, BCL (FY 1998)	

FUNDING

Funding By Priority Level
(Thousands of Dollars)

Year	Priority 1		Priority 2		Priority 3		Priority 4		Total	
	A*	C**	A	C	A	C	A	C	A	C
FY90	1,579	0	0	0	0	0	0	1,579	0	
FY91B	3,667	8,238	0	0	0	0	0	0	3,667	8,238
FY92	1,209	17,416	70	0	0	0	0	0	1,279	17,416
FY93	637	14,678	73	0	0	0	0	0	710	14,678
FY94	601	17,922	75	0	0	0	0	0	676	17,922
FY95	546	15,973	78	0	0	0	0	0	624	15,973
FY96	536	12,039	81	0	0	0	0	0	617	12,039
FY 92-96 TOT	3,529	78,028	377	0	0	0	0	0	3,906	78,028

A* Assessment C** Cleanup

Grand Total 81,934

CHICAGO OPERATIONS OFFICE
INSTALLATION SUMMARY - FERMI NATIONAL ACCELERATOR LABORATORY

Fermilab, located about 25 miles west of Chicago, Illinois, is a single-program installation for exploring the fundamental structure of matter using high-energy particle accelerators. Fermilab operates the Tevatron, the world's highest energy accelerator in both fixed-target and colliding beam modes.

EXTENT/TYPES OF CONTAMINATION	STATUS
• Soils contaminated with PCBs • Soils contaminated with chromates	Remediation of soils is near completion.

HEALTH RISKS	SPECIAL CONSIDERATIONS
Potential exists for worker exposure to PCBs and chromates based upon information collected to date.	

REGULATORY DRIVERS

- Applicable State regulations
- TSCA
- CERCLA
- CWA

REGULATORY AUTHORITIES

- Illinois EPA
- EPA Region V

MAJOR MILESTONES

Complete PCB cleanup (FY 1992)

CONTINUATION

FUNDING

Funding By Priority Level
(Thousands of Dollars)

Year	Priority 1		Priority 2		Priority 3		Priority 4		Total	
	A*	C**	A	C	A	C	A	C	A	C
FY90	0	0	0	0	0	0	0	0	0	0
FY91B	0	0	0	0	0	0	0	0	0	0
FY92	0	0	0	0	0	64	0	0	0	64
FY93	0	0	0	0	0	0	0	0	0	0
FY94	0	0	0	0	0	0	0	0	0	0
FY95	0	0	0	0	0	0	0	0	0	0
FY96	0	0	0	0	0	0	0	0	0	0
FY 92-96 TOT	0	0	0	0	0	64	0	0	0	64

A* Assessment C** Cleanup

Grand Total: 64

CHICAGO OPERATIONS OFFICE
INSTALLATION SUMMARY - PRINCETON PLASMA PHYSICS LABORATORY

PPPL, located in Princeton, New Jersey, conducts research in magnetic confinement fusion and also investigates the practical applications of plasma physics. These include the experimental demonstration of economical fusion power through development of the Tokamak series of fusion reactors.

EXTENT/TYPES OF CONTAMINATION	STATUS
Gasoline- and oil-contaminated soils	Removal and remediation of USTs was initiated in FY 1989 and is ongoing.

HEALTH RISKS	SPECIAL CONSIDERATIONS
Potential for contamination of underlying aquifer exists based on available information.	

REGULATORY DRIVERS

- Applicable State regulations
- RCRA/UST regulations

REGULATORY AUTHORITIES

New Jersey Department of Environmental Protection

MAJOR MILESTONES

- Complete soil remediation activities and installation of groundwater monitoring wells (FY 1990)
- Complete removal of third UST and restoration of excavation area (FY 1991)

CONTINUATION

FUNDING

Funding By Priority Level
(Thousands of Dollars)

Year	Priority 1 A*	Priority 1 C**	Priority 2 A	Priority 2 C	Priority 3 A	Priority 3 C	Priority 4 A	Priority 4 C	Total A	Total C
FY90	0	0	0	0	0	0	0	0	0	0
FY91B	0	0	0	0	0	0	0	0	0	0
FY92	0	0	20	0	0	0	0	0	20	0
FY93	0	0	21	0	0	0	0	0	21	0
FY94	0	0	15	0	0	0	0	0	15	0
FY95	0	0	15	0	0	0	0	0	15	0
FY96	0	0	15	0	0	0	0	0	15	0
FY 92-96 TOT	0	0	86	0	0	0	0	0	86	0

A* Assessment C** Cleanup

Grand Total: 86

IDAHO OPERATIONS OFFICE
INSTALLATION SUMMARY - GRAND JUNCTION PROJECT OFFICE

ID's GJPO is located on a 56-acre site adjacent to the Gunnison River in Western Colorado immediately south of the City of Grand Junction, Colorado (population 28,500). The primary mission of the GJPO is to apply project management, engineering, and geoscience expertise to support the DOE Environmental Restoration process. Major programs include UMTRA Grand Junction Vicinity Properties, Monticello Millsite and Vicinity Properties (NPL-listed sites being remediated under the authority of CERCLA), D&D at the GJPO site, and the postclosure long-term S&M of DOE disposal sites.

EXTENT/TYPES OF CONTAMINATION

- Uranium mill tailings were used for construction and landscaping on approximately 4,000 vicinity properties before the potential health hazards from radon gas and gamma radiation were recognized.
- Radium-226 exceeds EPA standards for soil at these 4,000 locations, and interior gamma radiation and interior radon/radon decay products may also exceed EPA interior standards at these locations.
- Asbestos and other hazardous and mixed wastes are commonly identified at these vicinity properties and at abandoned uranium millsites.
- Heavy metal concentrations in the groundwater beneath the GJPO facility and the Monticello Millsite exceed CWA limits and EPA/State standards.

STATUS

- REAs were completed at more than 3,400 of 4,000 Grand Junction Vicinity properties.
- Remediation construction was completed on more than 2,600 vicinity properties.
- GJPORAP RI/FS-EA was publicly reviewed and finalized. The ROD is scheduled for completion in FY 1990. Preliminary site activities are under way.
- Monticello Vicinity Property ROD was completed, and remediation activities are ongoing.
- Monticello Millsite Project RI/FS-EA was publicly reviewed and is finalized. The ROD is scheduled for completion in FY 1990. Detailed design will be initiated in FY 1991.
- The Long-Term S&M policy for the transfer of Title 1 sites is under development by GJPO and UMTRA-PO, Albuquerque.

HEALTH RISKS

- Unremediated vicinity properties can expose occupants of residential and commercial structures to unacceptable levels of radon gas, radon decay products, and gamma radiation.
- Residual radioactive materials from earlier uranium milling operations at GJPO and Monticello, Utah, can pose potential, near- and long-term health risks to offsite residents through groundwater contamination and potential surface water contamination.

SPECIAL CONSIDERATIONS

- State/DOE share funding of UMTRA.
- <u>Groundwater Restoration</u>: Proposed revisions to EPA regulations for UMTRA sites would require groundwater restoration.
- <u>GJPO Remedial Action Program</u>: Wastes must be removed by FY 1994.
- FFA was signed requiring cleanup by 1996.
- Monticello Vicinity Properties and Millsite are on the NPL.
- Passive restoration of groundwater is anticipated for GJPORAP and the Monticello Millsite.

REGULATORY DRIVERS

- PL-95-604, Uranium Mill Tailings Radiation Control Act
- 40 CFR 192 (Due to a federal court remand, EPA has issued draft UMTRA standards for groundwater protection. DOE is attempting to comply with these standards even though they have not been finalized.)
- PL 100-616
- Applicable State regulations
- Written agreement with the CDH on GJPO CERCLA remedial actions
- FFA for Monticello Remedial Action Project/Monticello Vicinity Properties

REGULATORY AUTHORITIES

- State of Utah Department of Health
- CDH
- EPA
- NRC

MAJOR MILESTONES

UMTRA

- Complete REAs at 450 vicinity properties (FY 1990)
- Complete remedial action on 650 vicinity properties (FY 1990)
- Complete all engineering (FY 1991)
- Complete nine major complex commercial projects (FY 1992)
- Complete the Grand Junction Vicinity Properties Project (FY 1993)

SFMP/GJPORAP

- Issue the Monticello Millsite ROD (FY 1990)
- Issue the GJPORAP ROD (FY 1990)
- Complete GJPORAP remedial action (FY 1992)
- Complete detailed Monticello Millsite design (FY 1992)
- Complete 100 Monticello Vicinity Properties remediations (FY 1993)
- Complete another 100 remediations (FY 1994)
- Complete Monticello Vicinity Properties remedial action (FY 1995)
- Complete Monticello Millsite remedial action (FY 1996)

CONTINUATION

FUNDING

Funding By Priority Level
(Thousands of Dollars)

Year	Priority 1		Priority 2		Priority 3		Priority 4		Total	
	A*	C**	A	C	A	C	A	C	A	C
FY90	4,321	31,799	0	0	0	0	0	0	4,321	31,799
FY91B	3,728	33,064	0	0	0	0	0	0	3,728	33,064
FY92	2,707	43,484	0	0	0	0	0	0	2,707	43,484
FY93	1,838	21,217	0	0	0	0	0	0	1,838	21,217
FY94	960	14,510	0	0	0	0	0	0	960	14,510
FY95	1,000	10,020	0	0	0	0	0	0	1,000	10,020
FY96	1,110	5,010	0	0	0	0	0	0	1,110	5,010
FY 92-96 TOT	7,615	92,241	0	0	3,070	0	0	0	7,615	94,241

A* Assessment C** Cleanup

Grand Total 101,856

IDAHO OPERATIONS OFFICE
INSTALLATION SUMMARY - IDAHO NATIONAL ENGINEERING LABORATORY

ID has responsibility for Environmental Restoration activities at INEL. INEL is situated in southern Idaho along the western edge of the Eastern Snake River Plains and encompasses an area of approximately 890 square miles of desert. The nearest major community is Idaho Falls (population 46,000), located 42 miles southeast of INEL. Activities at INEL include the operation of nuclear reactors, fuel processing plants, waste management facilities, and other supporting facilities. At INEL, approximately 350 waste management units are combined into 10 WAGs where characterization and eventual remediation will occur. D&D activities are ongoing at four sites. INEL was placed on the NPL in 1989, which will require CERCLA cleanup at three listed sites.

EXTENT/TYPES OF CONTAMINATION	STATUS
• Of the approximately 350 identified waste management units at INEL that make up the WAGs, only three have been confirmed to involve releases of hazardous constituents. Potential release site contaminants include petroleum products, acids, bases, solvents, heavy metals, radionuclides, PCBs, and asbestos. • INEL was placed on the NPL because of volatile organic and chromium migration in excess of CERCLA criteria. • The extent of contamination at the D&D facilities ranges from radionuclides to mixed hazardous wastes. Facilities on the D&D list not undergoing cleanup are in the S&M program to ensure safe containment of contaminants.	• Assessments are in progress on six of ten WAGs. • S&M (non-D&D) is being conducted for 350 identified potential release sites. • Cleanup is in progress on three WAGs. • D&D cleanup is being performed at three facilities, and assessment is in progress on the fourth. • D&D S&M is in progress for about 13 inactive/surplus facilities awaiting cleanup. • Buried TRU waste characterization was to have been done 4Q FY 1989, but unexpected problems prevented completion. • Twenty-nine COCA sites have been removed from the COCA list as a result of submitting Summary Assessments to EPA. About 20 more Summary Assessments have also been submitted.

HEALTH RISKS	SPECIAL CONSIDERATIONS
Potential risks to employees at INEL TAN, primarily through drinking water, have been mitigated.	INEL was placed on the NPL.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
· COCA between INEL and EPA Region X based on RCRA Sections 3008 (h) and 3004 (u) · Negotiations aimed at development of a CERCLA IAG, including INEL, EPA, and the State of Idaho · Applicable State regulations	· Idaho State Department of Health and Welfare · EPA Region X

MAJOR MILESTONES	CONTINUATION
· Conclude IAG (FY 1990) · Complete Buried Waste Program characterization (FY 1990) · Complete BORAX-V Turbine Building D&D (1990) · Complete SPERT-IV waste removal and remedial action (4Q FY 1990) · Complete INEL TAN groundwater assessment (4Q FY 1991) · Complete BWP (WAG 7-RWMC) RI/FS Report (FY 1994) · Complete cleanup of TAN, CFA, EBR I/BORAX, and miscellaneous WAGs (FY 1996)	

FUNDING

Funding By Priority Level
(Thousands of Dollars)

Year	Priority 1		Priority 2		Priority 3		Priority 4		Total	
	A*	C**	A	C	A	C	A	C	A	C
FY90	1,943	1,000	40,914	1,055	0	0	0	0	42,857	2,055
FY91B	855	1,150	30,167	6,537	0	50	0	0	31,022	7,737
FY92	500	2,340	61,125	15,209	150	2,000	0	0	61,775	19,549
FY93	300	0	57,590	25,560	250	0	0	0	58,140	25,560
FY94	300	0	45,210	28,120	150	300	0	0	45,660	28,420
FY95	300	0	45,300	25,880	150	0	0	0	45,750	25,880
FY96	300	0	42,300	39,740	150	0	0	0	42,750	39,740
FY 92-96 TOT	1,700	2,340	251,525	134,509	850	2,300	0	0	254,075	139,149

A* Assessment C** Cleanup

Grand Total 393,224

NEVADA OPERATIONS OFFICE
INSTALLATION SUMMARY - NEVADA TEST SITE

NV operates the NTS and historical test areas on the TTR and Air Force Range Area 13. NTS covers approximately 1,350 square miles of desert. The closest major population center is Las Vegas, about 80 miles southeast of NTS. NTS's primary mission is conducting belowground nuclear tests and, historically, aboveground nuclear tests. Approximately 800 individual sites were identified that include the aboveground and belowground testing locations, ancillary waste disposal sites associated with testing activities, and areas where surficial soils were contaminated with plutonium as a result of safety tests of nuclear devices. Pending further clarification as part of its planned ER program, NV considers CERCLA to be the primary regulatory authority governing any remediation of the sites. For active tunnel ponds and muckpiles that receive wastes generated during re-entry operations following nuclear tests, RCRA may be the primary regulatory authority.

EXTENT/TYPES OF CONTAMINATION

In addition to the releases from nuclear testing, radioactive and mixed solid and liquid wastes were disposed of at the NTS. Contaminants include surface and subsurface radionuclides, buried mixed waste, organic compounds, chromium and other metals, and petroleum. The total volumes of materials released and wastes generated have not been determined. Most of the materials were released as an unavoidable consequence of the nuclear testing, and the majority of the wastes generated were through re-entry operations associated with the testing. Waste disposal was through landfilling, underground injection, and leachfields on the NTS, as well as offsite disposal. Some small quantities of residual materials are still in inactive storage tanks located on the NTS. About 3,000 acres of soil is contaminated to a shallow depth with plutonium. There are eight facilities at the NTS where D&D is to be performed.

STATUS

During FY 1989 and FY 1990, the draft ER Program Management Plan for the field office was prepared, the Site-Specific Plan for the NTS and Offsite Locations was prepared and revised, and ADSs were developed for each of the WAGs at the NTS.

- A draft Groundwater Characterization Well work plan for the first set of wells was prepared and is under review.
- The initiation of the Yucca Flat RI/FS was deferred to FY 1990 to allow rescoring of the site and the signing of an agreement with the regulatory authority.
- The Area 23 Hazardous Waste Trench Closure Plan was submitted to the State regulatory authority for approval. Closure is expected to be complete by the end of FY 1990.
- Currently, the ER Program Management Plan and the plans for Groundwater Characterization are being revised to reflect the input received on NV's plans from regulatory authorities and the findings of the Tiger Team.

HEALTH RISKS

The health risks associated with known surface and subsurface contamination at the NTS have not been quantified. Because of the remote nature of the NTS and the rigidly controlled access to this facility, risks to the general public are expected to be minimal. There are limited risks to the work force as a result of testing activities; however, these risks are also considered minimal. These risks and the risks that will be present during the conduct of CERCLA programs at the NTS will be reduced through the worker training programs and the rigid safety protocols that have been implemented at the NTS. The primary focus of ER activities will be to reduce the uncertainties pertaining to the extent of contamination and its associated health risks. No known onsite or offsite health risks are associated with the planned D&D activities.

SPECIAL CONSIDERATIONS

A number of factors may affect current plans for ER activities. The NTS WAGs will be rescored using the new HRS procedures this fiscal year. Until this rescoring has been reviewed by the regulatory authorities, it is uncertain if the NTS will be a candidate for the NPL. Because of the nature of activities conducted at the NTS and the physical environment, there are constraints on the investigation and remediation of sites where contamination may be present. To enhance the ability to effectively clean up large areas with surficial contamination, a Technology Development program is ongoing.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
• It is anticipated that the NTS will be included on the NPL and that an agreement between DOE and the State of Nevada and/or EPA will be in place by January 1991 • CERCLA/SARA • RCRA • SDWA • Underground Injection Control regulations • NCP regulations • DOE Orders • Applicable State regulations	• Nevada Division of Environmental Protection • EPA Region IX

MAJOR MILESTONES	CONTINUATION
• Complete ER Program Management Plan (FY 1990) • Complete Area 23 Hazardous Waste Trench closure (FY 1990) • Complete draft overall RI/FS Work Plan for NV (FY 1990) • Sign Agreement in Principle with State of Nevada (FY 1990) • Sign Interagency Agreement with EPA and/or State of Nevada (FY 1991) • Initiate groundwater characterization well drilling (FY 1991) • Complete Active Tunnel Pond Assessment (FY 1991) • Initiate Yucca Flat RI/FS fieldwork (FY 1991) • Initiate Pahute Mesa RI/FS (FY 1992) • Initiate Sump and Injection Well RI/FS (FY 1992) • Initiate Frenchman Flat RI/FS (FY 1993) • Initiate Inactive Ponds and Muckpiles RI/FS (FY 1993) (Continued)	<u>Major Milestones</u> (Continued) • Begin Pu-contaminated soil cleanup at NAFR Area 13 (FY 1993) • Initiate Shoshone Mountain RI/FS (FY 1994) • Initiate Leachfields RI/FS (FY 1994) • Complete Closure Plan development (FY 1994) • Begin contaminated soil cleanup at TTR and NTS (FY 1995) • Complete soil cleanup at NAFR Area 13 (FY 1995) • Complete atmospheric test debris disposal program (FY 1995) • Begin remediation of inactive ponds and muckpiles (FY 1996)

FUNDING

Funding By Priority Level
(Thousands of Dollars)

Year	Priority 1		Priority 2		Priority 3		Priority 4		Total	
	A*	C**	A	C	A	C	A	C	A	C
FY90	1,220	0	925	569	0	0	0	0	2,145	569
FY91B	11,150	0	1,300	1,450	0	0	0	0	12,450	1,450
FY92	32,710	0	4,100	2,300	0	0	0	0	36,810	2,300
FY93	33,010	0	5,553	22,300	0	0	0	0	38,563	22,300
FY94	33,500	0	6,360	58,300	0	198	0	0	39,860	58,498
FY95	34,000	0	4,725	59,575	0	234	0	0	38,725	59,809
FY96	34,500	0	2,250	63,000	0	500	0	0	36,750	63,500
FY 92-96 TOT	167,720	0	22,988	205,475	0	932	0	0	190,708	206,407

A* Assessment C** Cleanup

Grand Total 397,115

NEVADA OPERATIONS OFFICE
INSTALLATION SUMMARY - NEVADA OFFSITE TEST LOCATIONS

NV manages eight offsite locations that are or were used primarily for testing nuclear explosive devices. The purpose of the underground nuclear tests conducted at these sites was to study the potential for gas field stimulation or other beneficial uses of nuclear detonations. These sites are located at Amchitka, Alaska; Grand Valley and Rifle, Colorado; Carlsbad and Farmington, New Mexico; Hattiesburg, Mississippi; Fallon, Nevada; and the Central Nevada Site near Goldfield, Nevada. The closest site to a major population center is Tatum Dome, which is located 21 miles southwest of Hattiesburg. Pending further clarification as part of the planned negotiations with the States, NV considers CERCLA to be the primary regulatory authority governing any remediation of these sites.

EXTENT/TYPES OF CONTAMINATION

- Subsurface contamination with radioactivity has been reported at the Amchitka site.
- Some groundwater contamination was found at the Rio Blanco Gas Stimulation Test Site near Grand Valley.
- No contamination or risks have been reported for the Rulison Gas Stimulation Test Site near Rifle.
- A significant release of radioactivity into the groundwater and some waste disposal of contaminated materials have been reported for the Gnome-Coach Site, 31 miles from Carlsbad.
- Contamination of a deep brine aquifer has been reported at the Tatum Dome Test Site near Hattiesburg.
- Slightly elevated concentrations of chromium have been found in a drilling mud disposal pit at the Central Nevada Test Site.

STATUS

- Preliminary Assessments have been conducted for all offsite locations and submitted to the appropriate regulatory authorities.
- Preliminary planning has been expanded with the splitting of the single offsite activity presented in the last Five-Year Plan into discrete investigation and remediation activities.
- Negotiations have been initiated with both the Nevada and the Mississippi regulatory authorities.

HEALTH RISKS

- Historically, cleanup activities have been conducted at each site after each nuclear test. In addition, long-term monitoring has been performed at each location.
- The Preliminary Assessments that were conducted for each of the offsite locations did not identify any significant threats to public health or the environment that would require interim remediation under the provisions of CERCLA.
- No environmental risks have been found associated with the Gasbuggy Stimulation Test Site near Farmington.
- No significant environmental risks have been identified at the Shoal Test Area near Fallon, Nevada.

SPECIAL CONSIDERATIONS

A number of factors may affect current plans for ER offsite activities. The NTS WAGs will be rescored using the new HRS procedures this fiscal year. The EPA regions for the offsite locations will be contacted to determine if rescoring will also be required for the offsite locations. Until the potential need for rescoring has been reviewed by the regulatory authorities, it is considered unlikely that any of the offsite locations will become candidates for the NPL. Because of the nature of activities conducted at these sites and the physical environment, there are constraints on the investigation and remediation of sites where contamination may be present. Negotiations with regulatory authorities are ongoing with Nevada and have been initiated in one offsite State (Mississippi). Pending negotiations and agreements with all the offsite States, specific activity requirements and schedules are uncertain.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
· Alaska water quality, drinking water, and solid waste management regulations · Colorado water quality and solid waste regulations · Mississippi water pollution control, waste disposal, underground injection, and groundwater use and protection regulations · Nevada waste management, disposal, air and water pollution control, radiation control, underground storage tank, and underground water and wells regulations · New Mexico waste management, water supply, and water quality regulations · CERCLA	· Alaska Department of Environmental Conservation · Colorado Department of Health · Colorado Division of Water Resources · Mississippi Bureau of Conservation and Water Resources · Mississippi Bureau of Pollution Control · Nevada Division of Environmental Protection · Nevada Division of Water Resources (State Engineer) · New Mexico Environmental Improvement Board · New Mexico Health and Environment Department · New Mexico State Engineer · New Mexico Water Quality Control Commission · EPA Region IV · EPA Region VI · EPA Region VIII · EPA Region IX · EPA Region X

MAJOR MILESTONES	CONTINUATION
· Complete Tatum Dome Work Plan (FY 1991) · Sign agreements in principle with regulatory authorities (FY 1991) · Initiate RI/FS efforts in Alaska, Colorado, New Mexico, and Nevada (FY 1992) · Complete Tatum Dome RI Report (FY 1993) · Complete Tatum Dome FS Report (FY 1993) · Begin remediation of Tatum Dome (FY 1994) · Complete all offsite investigations (FY 1994) · Complete remediation of Tatum Dome (FY 1996)	

FUNDING

Funding By Priority Level
(Thousands of Dollars)

Year	Priority 1		Priority 2		Priority 3		Priority 4		Total	
	A*	C**	A	C	A	C	A	C	A	C
FY90	0	0	135	0	0	0	0	0	135	0
FY91B	0	0	207	0	0	0	0	0	207	0
FY92	0	0	2,775	0	0	0	0	0	2,775	0
FY93	0	0	2,915	0	0	0	0	0	2,915	0
FY94	0	0	2,800	500	0	0	0	0	2,800	500
FY95	0	0	1,400	2,500	0	0	0	0	1,400	2,500
FY96	0	0	1,000	7,050	0	0	0	0	1,000	7,050
FY 92-96 TOT	0	0	10,890	10,050	0	0	0	0	10,890	10,050

A* Assessment C** Cleanup

Grand Total 20,940

OAK RIDGE OPERATIONS OFFICE INSTALLATION SUMMARY - FEED MATERIALS PRODUCTION CENTER

FMPC near Fernald, Ohio, is a large-scale, fully integrated facility with capabilities for processing uranium compounds into metals, melting and casting uranium metal, and machining uranium shapes to finished dimensions. Cleanup of the 1050-acre site and waste management now constitute the major site activities. Cleanup at the Reactive Metals, Inc., Extrusion Plant in Ashtabula, Ohio, is being performed in conjunction with these activities.

EXTENT/TYPES OF CONTAMINATION

- At FMPC, wastes include raffinate slurries containing uranium and radium; wastewaters and various solid wastes contaminated with uranium and thorium materials, pyrophoric, and reactive chemicals; oils contaminated with uranium; and organic solvents. More than 20 release sites and an estimated 900,000 cubic yards of waste have been identified.
- Onsite and offsite surface soil at RMI is contaminated, and groundwater contains above background concentrations of uranium. Fields Brook, which is adjacent to the site, contains PCBs, chlorinated solvents, toxic metals, and TCE.

STATUS

- The commitment to obtain a ROD on OU 6 in FY 1989 was rendered not applicable. It was decided that remediation will be covered under a removal action. Final remediation will be conducted under OU 5 as negotiated in the Consent Agreement.
- A sitewide RI/FS was initiated in 1986 to formulate, assess, and recommend RA alternatives to mitigate identified environmental concerns. This investigation has been segmented into 5 (formerly 6) distinct OUs.
- Corrective measures due to inactive facilities involve RCRA facilities/closures, RCRA waste handling, and the UST program.
- Implementation of cleanup actions at the Fields Brook Superfund site and other RMI facilities has been initiated.
- Cleanup at RMI of offsite surface soil and groundwater is planned.
- Cleanup of contamination in buildings and equipment at RMI is under way.

HEALTH RISKS

- There is uranium contamination in three offsite private wells. DOE dug one well as an alternate water supply.
- Radon emissions from silos are a potential health risk to workers.
- The CDC is performing an independent review of the FMPC historical emissions data to assess the accuracy of the reported emissions. It will then perform independent modeling and a dose and risk assessment before deciding whether to do an epidemiological study. The CDC review, independent modeling, and assessment are expected to take 18 months.
- An IT Corporation report on FMPC historical doses and potential health effects is expected to be released in the near future.

(Continued)

SPECIAL CONSIDERATIONS

This Plan does not reflect the Modernization Study proposals for FMPC and Reactive Metals, Inc., D&D.

REGULATORY DRIVERS

- Applicable State regulations-PAC
- RCRA
- CERCLA (NPL listed site)
- DOE Orders
- FFCA, 1986
- Consent decree from Ohio EPA, December 1988
- CERCLA Section 120/106 Consent Agreement
- NEPA

REGULATORY AUTHORITIES

- Ohio EPA
- EPA Region V
- DOE
- DOT
- SWOAPCA

MAJOR MILESTONES

- Issue Environmental Restoration Program for RMI (FY 1990)
- Submit draft RODs to EPA:
  OU 1 (1Q FY 1992)
  OU 2 (1Q FY 1992)
  OU 4 (4Q FY 1991)
  OU 3 (2Q FY 1992)
  OU 5 (2Q FY 1992)
- Initiate Title I and II Engineering for OUs 1 and 2 (FY 1993)
- Initiate Title I and II Engineering for ESF (FY 1993)
- Initiate Title I and II Engineering for OU 5 (FY 1993)
- Initiate Title I and II Engineering for OU 3 (FY 1993)
- Initiate Remediation Implementation for OUs 1 and 2 (FY 1993)
- Initiate Title I and II Engineering for ETPS Facility (FY 1993)

(Continued)

CONTINUATION

Health Risks (Continued)

- RI/FS are under way to assess potential public health and environmental impacts associated with past and present activities.

Major Milestones (Continued)

- Initiate Remediation Implementation for OU 5 (FY 1994)
- Initiate Remediation Implementation for ESF (FY 1994)
- Initiate Remediation Implementation for OU 3 (FY 1994)
- Complete Remediation of OU 1 Task 2 (FY 1995)
- Complete Remediation of OU 3 Tasks 1 and 3 (FY 1996)

FUNDING

Funding By Priority Level
(Thousands of Dollars)

Year	Priority 1 A*	Priority 1 C**	Priority 2 A	Priority 2 C	Priority 3 A	Priority 3 C	Priority 4 A	Priority 4 C	Total A	Total C
FY90	26,940	11,803	0	3,502	0	0	0	0	26,940	15,305
FY91B	22,386	59,754	0	342	0	0	0	0	22,386	60,096
FY92	16,495	114,293	0	3,702	0	0	0	20,455	16,495	138,450
FY93	11,870	231,785	0	2,572	0	0	0	27,979	11,870	262,336
FY94	5,754	308,565	0	2,285	0	0	0	20,662	5,754	331,512
FY95	12,469	352,594	0	1,984	0	0	0	20,662	12,469	375,240
FY96	12,469	308,849	0	1,722	0	0	0	20,662	12,469	331,233
FY 92-96 TOT	59,057	1,316,086	0	12,265	0	0	0	110,420	59,057	1,438,771

A* Assessment C** Cleanup

Grand Total 1,497,828

OAK RIDGE OPERATIONS OFFICE
INSTALLATION SUMMARY - FORMERLY UTILIZED SITES REMEDIAL ACTION PROGRAM

In 1974, DOE established FUSRAP to identify and clean up or otherwise control sites where residual radioactive material (exceeding current guidelines) remains from the early years of the Nation's atomic energy program. Remedial action at 25 sites is authorized by the Atomic Energy Act as amended. Public Law 98-50 directed DOE to conduct decontamination R&D projects at four additional sites (previously used essentially for commercial ventures). Public Law 98-360 directed DOE to reacquire a former Atomic Energy Commission site and use it as a disposal site.

EXTENT/TYPES OF CONTAMINATION

- FUSRAP sites include buildings and soil contaminated with radioactive, mixed radioactive, or hazardous chemical wastes and materials, consisting primarily of low concentrations of uranium, radium, and thorium.
- Contaminated sites include DOE-owned and leased property, other government property, privately owned commercial property, and residential vicinity properties.
- Volume estimates for major site groupings:
  Missouri 950,000 cubic yards
  New York 300,000 cubic yards
  New Jersey 600,000 cubic yards

STATUS

- Remedial Actions at 9 of the 30 sites have been completed.
- RIs are under way at four sites in Missouri, three sites in New Jersey, and five sites in New York.
- Interim RAs are under way in New Jersey, New York, Tennessee, Pennsylvania, Missouri, Oregon, and Massachusetts.
- Radiological monitoring and surveillance of Palos Park, Illinois, are ongoing.
- Management of Niagara Falls Storage Site under the Surplus Facilities Management Program continues.

HEALTH RISKS

Radioactive and mixed radioactive and hazardous contamination is present on privately owned property. This contamination is not adequately stabilized or controlled and could result in exposure above established guidelines. All sites are in urban areas. If contamination is not controlled, the public could be exposed to radiation by direct exposure, inhalation of suspended radionuclides, inhalation of radon isotopes, or ingestion of radionuclides.

SPECIAL CONSIDERATIONS

- Six of the 30 sites included in FUSRAP are listed on the NPL: Wayne and Maywood in New Jersey; Shpack in Massachusetts; and the St. Louis Airport site, Latty Avenue site, and their vicinity properties in Missouri. The three Missouri sites were placed on the NPL as one NPL listing.
- EPA Region II, EPA Region VII, and DOE are negotiating FFAs for the NPL sites in New Jersey and all FUSRAP sites in Missouri.

REGULATORY DRIVERS

- Finalized FFAs probable by FY 1991
- Applicable State regulations
- Atomic Energy Act, as amended
- Reports accompanying PL 98-50 and PL 98-360
- CERCLA
- NEPA
- RCRA
- CAA
- DOE Orders

REGULATORY AUTHORITIES

- State agencies in the affected states
- Various EPA Regional offices

MAJOR MILESTONES

- Complete designation surveys and decisions (FY 1990)
- Issue draft RI reports for four New York sites (FY 1991)
- Issue draft RI reports for two NPL sites in New Jersey (FY 1991)
- Publish environmental documentation for remedial action at Albany Research Center, Aliquippa Forge, and Elza Gate sites. Complete remedial action at Albany Research Center (FY 1991)
- Issue draft RI reports for four Missouri sites (FY 1991)
- Perform removal action at Elza Gate Site (FY 1992)
- Issue RODs for New York site (FY 1993)
- Issue RODs for New Jersey and Missouri sites (FY 1994)
- Acquire real estate for New York disposal site (ROD dependent) (FY 1993)
- Issue site selection report for New Jersey waste disposition (ROD dependent) (FY 1994)
- Start field investigation of selected New Jersey site (ROD dependent) (FY 1995)

(Continued)

CONTINUATION

Major Milestones (Continued)

- Cleanup vicinity properties in New Jersey and Missouri, as appropriate, to prevent the spread of contamination (FY 1991-1996)

FUNDING

Funding By Priority Level
(Thousands of Dollars)

Year	Priority 1		Priority 2		Priority 3		Priority 4		Total	
	A*	C**	A	C	A	C	A	C	A	C
FY90	7,262	4,997	64	0	0	0	0	0	7,326	4,997
FY91B	11,695	15,119	7,751	0	0	0	0	0	19,446	15,119
FY92	4,926	28,322	14,378	0	0	0	0	0	19,304	28,322
FY93	2,980	29,682	33,980	0	0	0	0	0	36,960	29,682
FY94	1,736	60,153	20,765	0	0	0	0	0	22,501	60,153
FY95	1,076	79,653	5,825	0	0	0	0	0	6,901	79,653
FY96	4,138	77,153	826	0	0	0	0	0	4,964	77,153
FY 92-96 TOT	14,856	274,963	75,774	0	0	0	0	0	90,630	274,963

A* Assessment C** Cleanup

Grand Total 365,593

OAK RIDGE OPERATIONS OFFICE
INSTALLATION SUMMARY - OAK RIDGE GASEOUS DIFFUSION PLANT

ORGDP occupies a 1,500-acre site adjacent to the Clinch River approximately 10 miles west of downtown Oak Ridge, Tennessee. The original mission of ORGDP was the production of enriched uranium hexafluoride for defense purposes. Because of a declining demand for enriched uranium, the enrichment process at ORGDP was placed on standby in 1985 and was shut down in 1987. ORGDP now has a multipurpose mission that includes being the location of many contractor central staff functions, operating waste treatment facilities, serving as a center for applied technology, and supporting the development of the Advanced Vapor Laser Isotope Separation uranium enrichment technology.

EXTENT/TYPES OF CONTAMINATION

- Operation of ORGDP for the past 44 years created facilities and sites that contain hazardous materials and wastes. The sites include burial grounds, process facilities, storage facilities, underground tanks, surface impoundments, treatment facilities, process lines, and accumulation areas that have the potential for releasing contaminants to the environment. Uranium-contaminated liquid and sludge, solid PCBs, and RCRA hazardous wastes will be incinerated onsite.
- One hundred ten SWMUs have been identified at ORGDP. Offsite surface waters have been contaminated with radionuclides, metals, and organic compounds.
- The gaseous diffusion facilities comprise approximately 140 acres. These facilities contain extensive amounts of asbestos insulation, RCRA oils and chemicals, PCBs, special nuclear materials, and residual radionuclides. The gas centrifuge buildings, with 325,000 square feet of floor space, contain contaminated and classified centrifuge equipment and process materials.

STATUS

- The SWMUs at ORGDP have been identified; 23 RFI plans have been submitted to EPA and TDHE.
- Groundwater monitoring is in progress.
- Closure of two surface impoundments by sludge removal and cement fixation is in progress.
- The TSCA Incinerator is expected to be in full operation in FY 1990 after the State air test in June (the original 1989 commitment date was not met).
- S&M activities for the inactive gaseous diffusion facilities and for the former centrifuge facilities are ongoing.
- Centrifuge facilities cleanup is in progress.
- Planning for D&D of the diffusion facilities has been initiated, the execution of which is estimated to take 30 years.

HEALTH RISKS

- Personnel exposure to friable asbestos-bearing materials, PCBs, and RCRA-regulated oils and chemicals is a concern in and around the gaseous diffusion facilities.
- Possible contamination of the Clinch River could affect municipal drinking water supply, fishing, and recreation.

SPECIAL CONSIDERATIONS

- Delay or deferral of the TSCA Incinerator would cause several DOE facilities to continue to be in violation of Federal and State regulations relating to the disposal of hazardous materials, and no options for alternative disposition exist.
- The gaseous diffusion facilities are the largest in the Defense facilities D&D program, and they require sustained S&M to ensure that health and safety requirements are met until decommissioning can be completed.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
• Applicable State regulations • Tennessee and Federal RCRA • Tennessee and Federal TSCA • RCRA Permit • CERCLA • NEPA • DOE Orders	• TDHE • EPA Region IV

MAJOR MILESTONES	CONTINUATION
• Start full operation of the TSCA Incinerator (4Q FY 1990) • Issue ORGDP D&D Plan (4Q FY 1990) • Complete centrifuge equipment disposal (4Q FY 1990) • Complete demolition of structurally unsafe cooling towers (4Q FY 1991) • Complete design and remediation of currently identified underground petroleum storage tanks (4Q FY 1991) • Complete sludge fixation of surface impoundments (4Q FY 1992) • Complete Phase II groundwater well installations (FY 1993) • Complete stripping of K-1210 centrifuge process area (FY 1994) • Dispose of all PCB materials in HEU shutdown facilities (FY 1995) • Demolish all unused cooling towers (FY 1996)	

FUNDING

Funding By Priority Level
(Thousands of Dollars)

Year	Priority 1		Priority 2		Priority 3		Priority 4		Total	
	A*	C**	A	C	A	C	A	C	A	C
FY90	25,896	14,255	8,673	3,280	2,609	135	0	400	37,178	18,040
FY91B	43,349	11,586	14,027	10,300	11,731	3,780	0	0	69,107	25,666
FY92	43,147	0	30,623	17,108	35,386	17,230	0	9,930	109,156	44,268
FY93	43,317	0	25,691	22,694	27,621	6,364	0	11,930	96,629	40,988
FY94	45,776	0	26,685	25,884	26,746	1,555	0	10,930	99,207	38,369
FY95	51,473	0	21,258	31,834	36,140	1,453	0	13,930	108,871	47,217
FY96	44,131	0	20,498	20,364	28,610	0	0	22,280	93,239	42,644
FY92-96 TOT	227,844	0	124,755	117,884	154,503	26,602	0	69,000	507,102	213,486

A* Assessment C** Cleanup

Grand Total 720,588

OAK RIDGE OPERATIONS OFFICE
INSTALLATION SUMMARY - OAK RIDGE NATIONAL LABORATORY

ORNL occupies several sites and covers approximately 2,900 acres in Melton Valley and Bethel Valley, 10 miles southwest of downtown Oak Ridge, Tennessee. ORNL's mission is to conduct applied research and engineering development in support of DOE's programs in fusion, fission, conservation, fossil, and other energy technologies and to perform basic scientific research in selected areas of the physical and life sciences. Past R&D and waste management activities at ORNL have produced a significant number of surplus, inactive facilities contaminated with low-level radioactive and/or hazardous chemical wastes.

EXTENT/TYPES OF CONTAMINATION

- Approximately 350 SWMUs have been identified at ORNL. Wastes that have been generated are primarily liquid and solid, low-level, intermediate-level, and TRU radioactive waste. Nonradioactive wastes include organic solvents, corrosive waste, PCBs, and heavy metals.
- D&D activities encompass a variety of facilities ranging from abandoned waste storage tanks to large experimental reactors.

STATUS

- The site has been divided into 20 WAGs, 13 of which will undergo detailed investigations.
- Ten of the 13 RI Plans have been completed and submitted to the State and EPA for review.
- Drafts of all major RI/FS project-level documents related to quality assurance, health and safety, data base management, and waste management have been completed.
- The RI for the Main Plant area (WAG 1) has been initiated.
- An RFI for SWSA 6 is under way, including chemical and radiological characterization of trench leachate.
- Staff at ORNL are providing technical assessment and field support to other DOE programs.

HEALTH RISKS

No immediate or short-term offsite health risks have been identified based on information available to date. However, there is surface and groundwater contamination, and there is offsite radionuclide contamination.

SPECIAL CONSIDERATIONS

- Nonstandard techniques/equipment may be identified and used during the WAG 10 RI since the hydrofracture wells are a unique problem.
- The magnitude of the ER cleanup effort can only be approximated because site characterization information is preliminary and current technology limitations make achievement of regulatory goals problematic for some sites (e.g, those containing TRU wastes).
- Scheduling for remediation of ORNL LLW USTs will be negotiated within the FFA process.

REGULATORY DRIVERS

- Applicable State regulations
- RCRA Permit
- SWDA
- FFA (EPA Region IV, TDHE, and DOE) has been negotiated and is at DOE-HQ for approval.
- DOE Orders

REGULATORY AUTHORITIES

- TDHE
- EPA Region IV

MAJOR MILESTONES

- Complete drilling of monitoring wells associated with basic network for principal WAGs (FY 1990)
- Complete in situ vitrification of pilot-scale radioactive seepage trench (FY 1990)
- Complete decommissioning of Building 3033 Storage Garden (FY 1990)
- Complete waste removal from High Radiation Level Analytical Facility (FY 1990)
- Submit WAG 6 RFI/CMS Report to EPA and TDHE (FY 1991)
- Submit WAG 2 RI Plan to EPA and TDHE for review, comment, and approval (FY 1992)
- Complete WAG 1 RI (FY 1994)
- Submit RI Plans for WAGs 11 and 13 to EPA and TDHE for review, comment, and approval (FY 1994)
- Complete decommissioning of the Metal Recovery Facility (FY 1994)

(Continued)

CONTINUATION

Major Milestones (Continued)

- Complete decommissioning of the Fission Product Development Laboratory (FY 1994)
- Complete WAG 4 RI (FY 1995)
- Complete decommissioning of the Fission Product Pilot Plant (FY 1995)
- Complete decommissioning of the Waste Evaporator Facility (FY 1995)
- Complete WAG 1 RI/FS (FY 1996)
- Complete WAG 4 RI/FS (FY 1996)
- Complete first phase of Homogeneous Reactor Experiment decommissioning (FY 1996)

FUNDING

Funding By Priority Level
(Thousands of Dollars)

Year	Priority 1		Priority 2		Priority 3		Priority 4		Total	
	A*	C**	A	C	A	C	A	C	A	C
FY90	4,978	3,815	26,364	1,300	406	148	28	15	31,776	5,278
FY91B	4,795	11,000	35,304	11,525	192	0	0	0	40,291	22,525
FY92	11,554	43,705	43,121	44,325	690	0	0	2,265	55,365	90,295
FY93	21,150	50,945	46,096	55,200	550	0	0	4,295	67,796	110,440
FY94	20,890	30,700	47,270	26,900	575	0	0	6,785	68,735	64,385
FY95	15,955	12,600	48,837	62,300	600	0	0	13,570	65,392	88,470
FY96	16,725	12,500	41,597	88,200	625	0	0	10,720	58,947	111,420
FY 92-96 TOT	86,274	150,450	226,921	276,925	3,040	0	0	37,635	316,235	465,010

A* Assessment C** Cleanup

Grand Total 781,245

OAK RIDGE OPERATIONS OFFICE
INSTALLATION SUMMARY - PADUCAH GASEOUS DIFFUSION PLANT

The principal onsite process at PGDP in Kentucky is the separation of uranium isotopes through gaseous diffusion. The process produces enriched uranium, which is used for nuclear fuel in commercial power plants and for military purposes. The site covers 750 acres (including 74 acres of process buildings). The site is included in a 3,422-acre tract of DOE-owned property.

EXTENT/TYPES OF CONTAMINATION

- Ninety-five SWMUs have been identified as needing site characterization.
- Groundwater contamination exists both onsite and offsite.
- Sediment and soil contamination exists both onsite and offsite.
- Major known contaminants are technetium-99, TCE in the groundwater, and PCBs.

STATUS

- The Phase I Investigation Site Work Plan for characterization of the rate and extent of contaminant migration was submitted to EPA and Kentucky and was approved by EPA. This met the commitment to complete this activity in FY 1989.
- Characterization work began in May 1989 under the site work plan required by the Consent Order, meeting the commitment to begin field investigation in FY 1989. Twelve wells and 50 borings are complete.

HEALTH RISKS

- All residents whose wells were contaminated have been placed on public water supplies. Surrounding residential wells are being monitored.
- Potential health risks exist if the contaminant plume is not characterized and remediated.

SPECIAL CONSIDERATIONS

- ER funding is included in the annual NE funding appropriation; however, revenue received for enrichment services to commercial and government customers is used to offset appropriations.
- The HSWA Permit to be issued with the RCRA Postclosure Permit or the RCRA T/S/D Permit is expected in FY 1990. The HSWA Permit will drive the RFI process for all other SWMUs and spill sites not addressed under the Consent Order.
- Additional manpower requirements were identified during the 1990 baseline review. This manpower is necessary to comply with ACO and HSWA Permit schedules.

REGULATORY DRIVERS

- Applicable State regulations
- DOE/EPA Administrative Consent Order for offsite contamination, signed November 23, 1988
- A RCRA Part B Permit to be issued by Kentucky
- The HSWA permit to be issued by EPA with first State RCRA Permit
- CWA 304(l)
- CERCLA
- DOE Orders

REGULATORY AUTHORITIES

- The State of Kentucky (through the Kentucky Natural Resources and Environmental Protection Cabinet and the Kentucky Cabinet for Human Resources) RCRA, CWA, and State environmental requirements
- EPA Region IV for CERCLA and HSWA

MAJOR MILESTONES

- Complete Phase I of work plan (FY 1990)
- Develop Phase II of work plan (FY 1990)
- Submit work plan for investigation of PCB contamination in KPDES outfalls (FY 1990)
- Complete investigation covered by DOE/EPA Consent Order (FY 1991)
- Complete work plans under HSWA Permit for high priority SWMUs not included in DOE/EPA Consent Order (FY 1991)
- Complete design for corrective actions required by DOE/EPA Consent Order (FY 1992)
- Complete remediation of PCB sources as required by CWA 304(l) (3Q FY 1992)
- Implement corrective actions covered by DOE/EPA Consent Order (4Q FY 1992)
- Complete alternative analyses for highest priority SWMUs (FY 1993)
- Complete analysis required by HSWA permit (FY 1994)
- Complete construction of remedial activities for groundwater contamination (FY 1994)

(Continued)

CONTINUATION

Major Milestones (Continued)

- Implement corrective actions required by HSWA Permit (FY 1995)
- Complete SWMU field investigations (FY 1996)

FUNDING

Funding By Priority Level
(Thousands of Dollars)

Year	Priority 1		Priority 2		Priority 3		Priority 4		Total	
	A*	C**	A	C	A	C	A	C	A	C
FY90	14,300	0	0	0	4,880	2,287	0	0	19,180	2,287
FY91B	5,703	0	0	0	12,742	2,040	0	0	18,445	2,040
FY92	2,437	3,000	0	0	22,829	2,542	0	0	25,266	5,542
FY93	2,437	5,000	0	0	23,445	4,071	0	0	25,882	9,071
FY94	2,437	2,000	0	0	14,137	9,021	0	0	16,574	11,021
FY95	2,437	0	0	0	9,137	8,021	0	0	11,574	8,021
FY96	2,437	0	0	0	5,639	3,021	0	0	8,076	3,021
FY 92-96 TOT	12,185	10,000	0	0	75,187	26,676	0	0	87,372	36,676

A* Assessment C** Cleanup

Grand Total 124,048

OAK RIDGE OPERATIONS OFFICE
INSTALLATION SUMMARY - PORTSMOUTH GASEOUS DIFFUSION PLANT

The principal onsite process at PORTS in Ohio is the separation of uranium isotopes through gaseous diffusion. This process produces enriched uranium, which is used for nuclear fuel in commercial power plants and for military purposes. The site covers 3,700 acres (including 93 acres for the process buildings) approximately 20 miles north of Portsmouth, Ohio.

EXTENT/TYPES OF CONTAMINATION

- Seventy-three SWMUs have been identified as needing site characterization.
- Known groundwater contamination exists at three units.
- Contamination plumes have been identified and are presently contained within the site boundary.
- As the 73 units are characterized, additional soil, surface water, air, and groundwater contamination is expected to be confirmed.
- Major contaminants are technetium-99, TCE, and PCBs.

STATUS

- Closure plans for four RCRA units have been approved by regulators.
- A groundwater assessment report for four RCRA units was completed, meeting the FY 1989 commitment date.
- The commitment to complete closure of X-616 in FY 1989 has been delayed until FY 1991 due to consent decree considerations and has been combined with three other units for completion in FY 1991.
- The commitment to submit the RFI work plan for Quadrant I in FY 1989 was not met due to delays in signing the Ohio Consent Decree and the EPA Administrative Consent Order.
- A general RFI plan has been approved by Ohio EPA and is under review by EPA.
- Decontamination of abandoned GCEP facilities is planned for FY 1992.

HEALTH RISKS

If DOE does not act within the next 5 years to remediate the groundwater contamination, offsite contamination will probably occur; this conclusion is based on the groundwater travel times at the site.

SPECIAL CONSIDERATIONS

ER funding is included in the annual NE funding appropriation; however, revenues received for enrichment services to commercial and government customers are used to offset appropriations.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
• Applicable State regulations • Administrative Consent Order between EPA and DOE under Section 3008(h) of RCRA, as amended, 42 USC Section 6928(h) and 106(a) of CERCLA, October 1989 • Consent Decree between State of Ohio and DOE, August 1989 • FFCA between DOE/EPA, December 1986 • RCRA/CERCLA • DOE Orders	• Ohio EPA for State environmental laws • EPA Region V for RCRA/CERCLA • Ohio EPA on closure of four RCRA hazardous waste disposal sites

MAJOR MILESTONES	CONTINUATION
• Submit RFI work plan for Quadrants II and III (FY 1990) • Complete closure of X-231B, X-616, X-701B, and X-749 (FY 1991) • Submit RFI work plan for Quadrant IV (FY 1991) • Complete RFIs (FY 1992) • Complete decontamination of abandoned facilities (FY 1992) • Complete corrective measures studies (FY 1993) • Implement Quadrant III corrective measures (FY 1993) • Complete GCEP Termination Program (FY 1993) • Upgrade 46 USTs with release detection systems (FY 1993) • Implement Quadrants I and IV corrective measures (FY 1994) • Implement Quadrant II corrective measures (FY 1995) • Complete Quadrants I, II, III, and IV Corrective Measures Implementation (FY 1996)	

FUNDING

Funding By Priority Level
(Thousands of Dollars)

Year	Priority 1		Priority 2		Priority 3		Priority 4		Total	
	A*	C**	A	C	A	C	A	C	A	C
FY90	0	4,093	12,645	1,100	0	0	2,160	0	14,805	5,193
FY91B	0	0	10,078	1,100	0	0	0	0	10,078	1,100
FY92	0	0	16,600	4,800	0	0	5,280	1,200	21,880	6,000
FY93	0	0	9,175	13,313	0	0	1,280	0	10,455	13,313
FY94	0	0	8,675	38,313	0	0	0	0	8,675	38,313
FY95	0	0	8,175	36,313	0	0	0	0	8,175	36,313
FY96	0	0	7,675	20,513	0	0	0	0	7,675	20,513
FY 92-96 TOT	0	0	50,300	113,252	0	0	6,560	1,200	56,860	114,452

A*Assessment C**Cleanup

Grand Total 171,312

OAK RIDGE OPERATIONS OFFICE
INSTALLATION SUMMARY - WELDON SPRING SITE
REMEDIAL ACTION PROJECT

This site, located about 30 miles west of St. Louis, Missouri, was used by the Army as an ordnance works in the 1940s and 1950s; then, in the late 1950s and 1960s the AEC used Weldon Spring for the processing of uranium and thorium. The site is currently on the EPA NPL, and DOE is conducting a comprehesive RA, including long-term management of radiological waste.

EXTENT/TYPES OF CONTAMINATION

The Weldon Spring Site includes the following:

- Quarry - 9-acre site containing 95,000 cubic yards of radiologically contaminated soil and rubble and 3,000,000 gal of radiologically or chemically contaminated water
- Raffinate Pits - 4 waste lagoons, 250,000 cubic yards of raffinate sludges, and 57 million gal of radioactive or chemically contaminated water
- Plant - 41 buildings and other structures and 470,000 cubic yards of contaminated soil and building material
- Vicinity Properties - Approximately 25,000 cubic yards of contaminated soil
- Groundwater - Nitroaromatic and radiological contaminated groundwater at the quarry and the plant sites

STATUS

- Radiological and chemical characterization of the site was completed in 1988.
- The 1989 commitment to issue a draft RI/FS EA for quarry bulk waste removal was rendered no longer applicable due to incorporation of the EA into the RI/FS.
- Environmental Compliance (CERCLA and NEPA):
  (1) RI/FS-EIS Work Plan was issued in 1988.
  (2) RI/FS for quarry bulk waste removal was reviewed by EPA and the State and issued to the public in March 1990.
  (3) RI and Baseline Risk Assessment for chemical plant cleanup and waste disposal have been reviewed by EPA and the State and are nearing completion.
  (4) EE/CA for site water treatment plant was submitted to EPA and State in February 1990.
- Several interim response actions have been completed, and others are under way, including asbestos abatement, PCB abatement, buildings demolition, chemicals stabilization, and uncontrolled offsite uranium discharges reduction.

HEALTH RISKS

- No immediate health risks have been identified based on information available to date.
- Radiological and chemical contamination has migrated beyond the quarry site boundary. A county well supply is within one-half mile of the quarry site.
- Radiological and chemical contamination has migrated beyond the plant site boundary.
- A large high school is located downwind of the site and within one-quarter mile of the site boundary.

SPECIAL CONSIDERATIONS

- Acting on guidance from the OMB, DOE and the Army have signed an MOU for joint funding of RAs for the plant site.
- To ensure employee safety, OSHA regulations relating to medical surveillance and training for field workers in hazardous waste operations have been implemented.

REGULATORY DRIVERS

- Applicable State regulations
- FFA with EPA Region VII, August 1986
- NPDES Permits (November 1988; May 1989; another due in 1990)
- DOE Orders
- CERCLA
- NEPA

REGULATORY AUTHORITIES

- MDNR
- Missouri Department of Health
- EPA Region VII

MAJOR MILESTONES

- Complete ROD for quarry bulk waste removal (FY 1990)
- Issue Quarry RI/FS documents (FY 1990)
- Issue Draft Site FS (FY 1990)
- Issue site ROD for waste disposition (FY 1991)
- Initiate excavation of quarry bulk waste (FY 1992)
- Complete vicinity property RA (FY 1994)
- Complete quarry bulk waste excavation (FY 1995)
- Complete dismantling of four buildings (FY 1996)

CONTINUATION

FUNDING

Funding By Priority Level
(Thousands of Dollars)

Year	Priority 1 A*	Priority 1 C**	Priority 2 A	Priority 2 C	Priority 3 A	Priority 3 C	Priority 4 A	Priority 4 C	Total A	Total C
FY90	1,587	7,943	0	0	0	0	0	0	1,587	7,943
FY91B	987	24,998	0	0	0	0	0	0	987	24,998
FY92	1,933	49,610	0	0	0	0	0	0	1,933	49,610
FY93	2,073	50,772	0	0	0	0	0	0	2,073	50,772
FY94	615	47,946	0	0	0	0	0	0	615	47,946
FY95	529	50,970	0	0	0	0	0	0	529	50,970
FY96	234	49,064	0	0	0	0	0	0	234	49,064
FY 92-96 TOT	5,384	248,362	0	0	0	0	0	0	5,384	248,362

A* Assessment C** Cleanup

Grand Total 253,746

OAK RIDGE OPERATIONS OFFICE
INSTALLATION SUMMARY - Y-12 PLANT

The Y-12 Plant occupies an 811-acre site in the Bear Creek Valley approximately 2 miles from downtown Oak Ridge, Tennessee. The site is drained by Bear Creek and East Fork Poplar Creek. The Plant, built in 1943 as part of the Manhattan Project, was established to separate uranium isotopes by the electromagnetic process. When the process was discontinued after World War II, Y-12's role changed to manufacturing and developmental engineering. The Y-12 Plant contains many facilities that have been used for treating, storing, or disposing of hazardous waste and hazardous substances. Examples include landfills, incinerators, drum storage areas, aboveground storage tanks, underground storage tanks, surface impoundments, and treatment facilities.

EXTENT/TYPES OF CONTAMINATION

Site contamination includes hazardous materials, low-level radioactive material (primarily uranium), and mixed wastes resulting primarily from the weapons production processes. Some of the wastes are highly reactive-pyrophoric and pyrotechnic. The contaminated sites in need of ER include past-practice waste disposal sites, waste storage tanks, spill sites, and contaminated inactive facilities. In addition, significant inventories of mercury are present onsite and offsite in the East Fork Poplar Creek floodplain soils and sediments.

STATUS

- Twenty-four of the approximately 30 RFI/RI plans have been submitted to regulators for approval.
- Investigation and assessment work has been initiated at several sites.
- Closures of four RCRA land-based sites have been completed. Closure of remaining land-based sites is under way.
- D&D of the Alpha-4 Building, which contains mercury contamination, is planned.
- Work will begin on RFIs for ten sites, including Bear Creek, the Waste Coolant Processing Facility, the Salvage Yard Area, the Filled Coal Ash Pond, and the Coal Pile Trench.
- RFI Plans were submitted to regulators for five sites in December 1989, including Upper East Fork Poplar Creek and the Nitric Acid Pipeline.

HEALTH RISKS

- Potential health risks exist from offsite migration of contamination, in particular, mercury contamination.
- A 1985 study by CDC and the TDHE concluded that residents of Oak Ridge are not likely to be at increased risk for having significantly high mercury levels despite its presence in the local environment. Urinary and hair mercury concentrations found in the study were within background ranges.
- To ensure health and safety of employees, some inactive work areas are being decontaminated and some active work areas are being cleaned of past contaminants.

SPECIAL CONSIDERATIONS

- Health and safety risks posed by particular contaminants at some SWMUs and the public's concern for several key units, particularly East Fork Poplar Creek, have escalated the need for immediate action.
- Risk assessments and groundwater studies are being conducted as part of postclosure activities associated with the capping and/or decommissioning of eight RCRA land-based sites.
- There has been considerable variability in the time required for review of RFI Plans by TDHE and EPA, ranging from a few weeks to over 14 months.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
• Applicable State regulations • RCRA Permit • MOU (DOE, EPA, and TDHE) • FFA (EPA Region IV, TDHE, and DOE) being negotiated • CERCLA • DOE Orders	• TDHE • EPA Region IV

MAJOR MILESTONES	CONTINUATION
• Construct caps for five land-based sites (3Q-4Q FY 1990) • Complete closure of RCRA land units (4Q FY 1990) • Complete closure of Kerr Hollow Quarry (4Q FY 1990) • Decommission East Borrow Area (4Q FY 1990) • Complete submittal of RFI plans (1Q FY 1991) • Decommission West Borrow Area (2Q FY 1991) • Submit RFI Report for Bear Creek (3Q FY 1992) • Complete Remedial Action Plan and ROD for East Fork Poplar Creek (FY 1993) • Submit Remedial Action Plan for Filled Coal Ash Pond (FY 1994) • Complete decontamination (mercury) of Building Alpha-4 (FY 1995) • Submit Closure Report for Plating Shop container areas (FY 1996)	

FUNDING

Funding By Priority Level
(Thousands of Dollars)

Year	Priority 1		Priority 2		Priority 3		Priority 4		Total	
	A*	C**	A	C	A	C	A	C	A	C
FY90	1,650	16,600	7,800	668	1,000	550	0	0	10,450	17,818
FY91B	1,600	2,700	10,800	11,480	3,000	1,560	0	0	15,400	15,740
FY92	238	13,536	10,043	21,825	4,037	1,172	0	750	14,318	37,283
FY93	150	22,597	5,831	25,979	2,046	3,000	0	100	8,027	51,676
FY94	0	16,213	5,174	32,947	2,058	4,000	0	0	7,232	53,160
FY95	0	12,666	1,186	38,313	2,062	5,000	0	0	3,248	55,979
FY96	0	10,536	686	41,313	2,062	6,000	0	0	2,748	57,849
FY 92-96 TOT	388	75,548	22,920	160,377	12,265	19,172	0	850	35,573	255,947

A*Assessment C**Cleanup

Grand Total: 291,520

RICHLAND OPERATIONS OFFICE
INSTALLATIONS SUMMARY - HANFORD SITE 100 (REACTOR) AREA

The Hanford Site facilities near Richland, Washington, were originally dedicated to the production of plutonium for national defense and management of wastes generated by chemical processing operations. Nine reactors and related facilities used for plutonium production are in the 100 Area. All reactors are located next to the Columbia River, which was used as a source of cooling water.

EXTENT/TYPES OF CONTAMINATION

- Approximately one-quarter of the waste sites at Hanford are located within the 100 Area.
- The inactive contaminated facilities in the 100 Area include eight surplus graphite-moderated reactors and the effluent systems and ancillary facilities that supported operation of the reactors. There is also one reactor (N-Reactor) on cold standby.
- Tritium is one of the main contaminants found in the groundwater.
- Waste sites include burial grounds, trenches, retention basins, septic tanks, cribs, etc.

STATUS

- Assessment and characterization are required on 23 OUs in the 100 Area. Three RI/FS or RFI/CMS work plans on OUs 100-HR-1, 100-HR-3, and 100-DR-1 have been prepared and submitted to the regulators. Four additional work plans have been started, and 11 are scheduled for completion and submittal to the regulators in FY 1990. Plans are on schedule for meeting this commitment.
- During the regulatory RI/FS or RFI/CMS work plan review, dates for ROD issuance will be negotiated on four OUs in preparation.
- S&M of inactive radioactively contaminated facilities is ongoing.
- Ongoing activities in D&D include the closure of the 183-H Solar Evaporation Basin, asbestos removal from the 105-C and 105-H reactor buildings, and submittal of the final report for the Surplus Reactor EIS ROD. In early FY 1990 the liquids in the 183-H Basins were solidified.
- D&D on the 100 Area Ancillary facilities has been deferred to FY 1992, and D&D activities on the surplus reactors and effluent facilities will follow the ROD projected for issuance in FY 1991.

HEALTH RISKS

- The health risk associated with the waste sites at Hanford cannot be quantified until a major portion of the characterization work associated with the RIs and RFIs is complete. A baseline risk assessment will be performed for each OU.
- The 100 Area is located adjacent to the Columbia River. Although monitoring of groundwater and the Columbia River shows no immediate health risk associated with the 100 Area, the potential exists since higher than MCL for chronium, strontium-90, and tritium has been detected in the aquifier beneath the 100 Area. The volume of waste disposed of in the area and its location make the characterization and cleanup, as required, of the area a high priority.

SPECIAL CONSIDERATIONS

- Reconciliation/integration of RCRA/CERCLA/NEPA requirements are ongoing.
- OUs in the 100-H Area have been assigned a high priority because of their proximity to the Columbia River.
- All Reactor Liquid Effluent OUs and groundwater OUs have been given a high priority because of their proximity to the Columbia River.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
• TPA recently finalized among DOE, EPA, and the State of Washington Department of Ecology, known as the Hanford Federal Facility Agreement and Consent Order • RCRA - As implemented through State of Washington Dangerous Waste Regulations • CERCLA	• State of Washington Department of Ecology and Department of Social and Health Services • Benton, Franklin, and Walla Walla Counties Air Pollution Control Authority • EPA Region X

MAJOR MILESTONES	CONTINUATION
• 183-H Solar Evaporation Basin Closure - Complete liquid solidification (FY 1990) - Complete basin decontamination (FY 1991) • Surplus Production Reactors - Prepare Decommissioning Draft EIS - Complete - Publish the final EIS (FY 1990) - Issue the ROD (1991) • Submit seven RI/FS or RFI/CMS work plans to EPA/State of Washington Department of Ecology for review/approval (FY 1990) • Submit four additional RI/FS or RFI/CMS work plans to EPA/State of Washington Department of Ecology for review/approval (FY 1992) • Submit two additional RI/FS or RFI/CMS work plans to EPA/State of Washington Department of Ecology for review/approval (FY 1993)	

FUNDING

Funding By Priority Level
(Thousands of Dollars)

Year	Priority 1		Priority 2		Priority 3		Priority 4		Total	
	A*	C**	A	C	A	C	A	C	A	C
FY90	174	8,134	8,779	0	0	0	0	0	8,953	8,134
FY91B	0	10,790	0	0	0	0	0	0	0	10,790
FY92	0	12,800	42,864	2,000	0	2,977	0	0	42,864	17,777
FY93	0	3,950	71,274	5,000	0	5,707	0	0	71,274	14,657
FY94	0	3,950	84,453	10,000	0	3,255	0	0	84,453	17,205
FY95	0	2,450	83,034	10,000	0	1,103	0	0	83,034	13,553
FY96	0	2,450	65,437	24,100	0	298	0	0	65,437	26,848
FY 92-96 TOT	0	25,600	347,062	51,100	0	13,340	0	0	347,062	90,040

A* Assessment C** Cleanup

Grand Total 437,102

RICHLAND OPERATIONS OFFICE
INSTALLATION SUMMARTY - HANFORD SITE 200 (CHEMICAL PROCESSING AND WASTE OPERATIONS) AREA

The Hanford Site facilities near Richland, Washington, were originally dedicated to the production of plutonium for national defense and management of wastes generated by chemical processing operations. Chemical processing and radioactive, hazardous, and mixed waste operations are centralized in the 200 Area. Some sites are located in the adjoining 600 Area.

EXTENT/TYPES OF CONTAMINATION

Radioactive and mixed solid and liquid wastes are stored and disposed of in the 200 Area. Approximately 95 percent (by volume and curie) of the Hanford Site radioactive and mixed waste, representing two-thirds of the waste sites, is located in or just outside of the 200 Area. A wide variety of disposal techniques has been used in the last 40 years, ranging from shallow land burial to injection wells into the groundwater. Large volumes of soil (about 580,000 cubic meters) have been contaminated with low-level and TRU radionuclides and hazardous chemicals from the past discharge of liquids to the soil column. Approximately 37 million gal of high-level, TRU, and low-level mixed waste is stored in 149 SSTs. These inactive tanks contain mostly residual sludges and saltcake resulting from the transfer or evaporation of liquids. Approximately 33 percent of the Hanford Site waste radionuclide inventory resides in the SSTs. Approximately 750 thousand gal of waste has leaked to the surrounding soil from some SSTs. Sixty-six SSTs have been identified as either confirmed leakers or suspected leakers. A wide variety of contaminants has been identified in the groundwater, including cesium, tritium, technetium, and uranium.

STATUS

- Assessment and characterization is required on 43 OUs in the 200 Area. The RI/FS work plan on OU 200-BP-1 (contains cribs used by chemical separations plants) has been approved by the regulators, and the RI work has begun. The work plans for OUs 200-UP-2, 200-BP-6, and 200-ZP-1 are currently scheduled to start in FY 1991 and FY 1992 per the Hanford FFA and Consent Order (September 19, 1989). Actions on subsequent OUs, including 200-PO-2 and 200-BP-11, are planned, but specific dates for individual OUs are subject to annual negotiated updates of the Agreement. In addition, waste assessment and characterization of materials stored in 149 SSTs have been initiated. Sufficient information should be available by the late 1990s to recommend final closure alternatives.
- D&D of the Strontium Semiworks Plant in the 200 East Area is in progress, which included the demolition of the 2707-C Building in 1989. D&D of a surplus plutonium concentration facility (Building 224-B) is planned.

HEALTH RISKS

- The health risk associated with the waste sites at Hanford cannot be quantified until a major portion of the characterization work associated with the RIs and RFIs is complete. A baseline risk assessment will be performed for each OU.
- The 200 Area is located in the center of the reservation at least 5 miles from the Columbia River and contains approximately two-thirds of the waste sites at Hanford, including the SSTs. The groundwater is several hundred feet below ground level in this area. Although monitoring of groundwater and the Columbia River shows no immediate health risk associated with the 200 Area, the potential for risk exists since higher than MCL for tritium and other chemicals and radionuclides has been detected in the aquifier beneath the 200 Area. The volume of waste disposed of in the area makes the characterization and required cleanup of the area a high priority.

SPECIAL CONSIDERATIONS

- The waste located in the 200 Area includes large amounts of hazardous and radioactively mixed waste disposed of in the soil column, and about 60 percent of the nation's high-level mixed waste is currently stored in underground tanks.
- In accordance with the EIS ROD released in April 1988 for the disposal of Hanford Defense High-Level TRU and Tank Wastes (DOE-EIS-0113) (DOE-HQ 1987), additional development and evaluation will be conducted before making a final closure decision on the SST system.
- The disposal of SST wastes is considered the toughest technical issue at the site; it is also a high priority issue with the States of Washington and Oregon and the citizens of the regions.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
· TPA recently finalized among DOE, EPA, and the State of Washington Department of Ecology, known as the Hanford FFA and Consent Order · RCRA - As implemented through State of Washington Dangerous Waste Regulations · CERCLA	· State of Washington Department of Ecology and Department of Social and Health Services · Benton, Franklin, and Walla Walla Counties Air Pollution Control Authority · EPA Region X

MAJOR MILESTONES	CONTINUATION
· Initiate underground tank D&D at the Strontium Semiworks Plant (FY 1991) · Submit draft RI/FS work plan for 200 BP-5 (FY 1992) · Submit draft RI/FS work plan for 200 UP-2 (FY 1992) · Submit draft RI/FS work plan for 200 ZP-1 (FY 1993) · Complete Strontium Semiworks Plant D&D (FY 1994) · Develop SST waste retrieval technology and complete scale model testing (FY 1994) · Complete design for installation of piping and other SST waste removal equipment (FY 1995)	

FUNDING

Funding By Priority Level
(Thousands of Dollars)

Year	Priority 1		Priority 2		Priority 3		Priority 4		Total	
	A*	C**	A	C	A	C	A	C	A	C
FY90	0	1,030	15,374	3,150	0	0	0	0	15,374	4,180
FY91B	75	1,574	27,388	2,496	0	0	0	0	27,463	4,070
FY92	75	2,615	33,722	4,170	0	2,100	0	700	33,797	9,585
FY93	75	2,602	49,703	7,424	0	3,192	0	1,100	49,778	14,318
FY94	75	3,582	88,384	1,617	0	4,961	0	5,500	88,459	15,660
FY95	75	1,900	115,336	2,925	0	817	0	5,500	115,411	11,142
FY96	75	3,000	148,276	6,960	0	0	0	5,500	148,351	15,460
FY 92-96 TOT	375	13,699	435,421	23,096	0	11,070	0	18,300	435,796	66,165

A* Assessment   C** Cleanup   Grand Total 501,961

RICHLAND OPERATIONS OFFICE
INSTALLATIONS SUMMARY - HANFORD SITE 300 (LABORATORY AND FUEL FABRICATION) AREA

The Hanford Site facilities near Richland, Washington, were originally dedicated to the production of plutonium for national defense and to the management of wastes generated by chemical processing operations. Laboratory R&D activities are, and fuel fabrication was, centralized in the 300 Area. The 400 Area is grouped with the 300 Area and is the location of the FFTF, where experiments in advanced reactor design are being carried out.

EXTENT/TYPES OF CONTAMINATION

- Six OUs are located in the 300 and 400 Areas.
- The 300 Area waste sites are primarily burial grounds, cribs, ponds, ditches, and chemical spill sites containing radioactive, mixed, and hazardous liquid and solid wastes.
- The 400 Area waste sites are located primarily at the FFTF.

STATUS

- Assessment and characterization of four OUs located in the 300/400 Area of the Hanford Site are planned. One OU, which contains the South and North Process Ponds, was given high priority by the HRS in the PA/SI. The RI/FS Work Plan for this OU is near completion, preliminary surface characterization work has begun, and the RI will begin after Work Plan approval by the EPA/State of Washington Department of Ecology.
- Selection of the effluent treatment option for the 300 Area Process Trench is in progress. A schedule for implementing treatment and ceasing liquid discharges is being established as one of the Hanford Site's highest priorities.
- Milestone dates for RI and the Phase I Report Proposed Plan and ROD on 300-FF-1 and 300-FF-5 are currently being negotiated as part of the regulator work plan review process.
- Cleanup of Hot Cells in the 324 and 325 Buildings has started and is ongoing to satisfy cell space requirements for the HWVP.

HEALTH RISKS

- The health risk associated with the waste sites in the 300/400 Area cannot be quantified until a major portion of the characterization work associated with the RIs is complete.
- The 300 Area is located adjacent to the Columbia River and several miles north of the City of Richland. Although monitoring of groundwater and the Columbia River shows no immediate health risk associated with the 300 Area, the potential exists since higher than MCL for uranium, trichloroethylene, flouride, and dichloroethylene have been detected in the aquifier beneath the 300 Area. The volume of waste disposed of in the area and its location make the characterization and cleanup a high priority.

SPECIAL CONSIDERATIONS

The waste units in the 300 Area grouping were among the highest ranked sites in the nation as ranked by the HRS. Early surface radiation surveys revealed previously unknown pockets of low-level radioactive contamination. Though not considered a health hazard, the area has been appropriately posted, and access has been restricted.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
• TPA recently finalized among DOE, EPA, and the State of Washington Department of Ecology, known as the Hanford FFA and Consent Order • RCRA - As implemented through State of Washington Dangerous Waste Regulations • CERCLA	• State of Washington Department of Ecology and Department of Social and Health Services • Benton, Franklin, and Walla Walla Counties Air Pollution Control Authority • EPA Region X

MAJOR MILESTONES	CONTINUATION
• Complete two RI/FS work plans for OUs 300-FF-1 and -5 (FY 1990) • Complete 300 Area Process Trench effluent treatment option conceptual design and establish schedule to implement treatment and cease liquid discharges (FY 1990) • Submit 300 Area process trenches Closure/Postclosure Plan to EPA/State of Washington Department of Ecology for review (FY 1992) • Cease all discharges to 300 Area process trenches (FY 1992) • Complete 300 Area Treated Effluent system (FY 1995)	

FUNDING

Funding By Priority Level
(Thousands of Dollars)

Year	Priority 1		Priority 2		Priority 3		Priority 4		Total	
	A*	C**	A	C	A	C	A	C	A	C
FY90	500	0	3,876	0	0	0	0	0	4,376	0
FY91B	525	0	4,476	0	0	0	0	0	5,001	0
FY92	1,050	0	12,440	7,750	0	525	0	3,000	13,490	11,275
FY93	1,075	0	16,791	10,500	0	0	0	3,500	17,866	14,000
FY94	1,100	0	14,493	16,000	0	0	0	3,500	15,593	19,500
FY95	1,125	0	12,363	12,500	0	0	0	4,000	13,488	16,500
FY96	1,150	0	8,093	13,340	0	0	0	3,500	9,243	16,840
FY 92-96 TOT	5,500	0	64,180	60,090	0	525	0	17,500	69,680	78,115

A* Assessment C** Cleanup

Grand Total 147,795

RICHLAND OPERATIONS OFFICE
INSTALLATIONS SUMMARY - HANFORD SITE 1100 (VEHICLE MAINTENANCE FACILITIES) AREA

The Hanford Site facilities near Richland, Washington, were originally dedicated to the production of plutonium for national defense and to the management of wastes generated by chemical processing operations. Material receipt and warehousing and vehicle maintenance activities are centralized in the 1100 Area.

EXTENT/TYPES OF CONTAMINATION

The 1100 Area includes three sites used for the disposal of battery acids, paints, thinners, solvents, degreasers, PCBs, and antifreeze. One 600 Area OU is grouped with the 1100 Area (septic tanks and former Nike Missile Site).

Note: This 600 Area site work is not due to start until after FY 1996.

STATUS

The RI/FS work plan for OU 1100-EM-1 has been approved by the regulators, and the RI work has begun.

HEALTH RISKS

- The health risk associated with the waste sites at Hanford cannot be quantified until a major portion of the characterization work associated with the RI is complete.
- The 1100 Area is located adjacent to the City of Richland, and several of the waste sites are within 3000 ft of the North Richland Well Field, which is a major source of water for the City of Richland. Although monitoring wells show that no contamination has reached the well field, sufficient volumes of battery acid, paint, antifreeze, and solvents have been disposed of into the soil column to give the 1100 Area a high priority for characterization and cleanup to mitigate the potential health risk.

SPECIAL CONSIDERATIONS

High priority has been given to the RI/FS work on sites in the 1100 Area because they are located at the north boundary of the City of Richland near a city water supply well field.

REGULATORY DRIVERS

- TPA recently finalized among DOE, EPA, and the State of Washington Department of Ecology, known as the Hanford FFA and Consent Order
- RCRA - As implemented through State of Washington Dangerous Waste Regulations
- CERCLA

REGULATORY AUTHORITIES

- State of Washington Department of Ecology and Department of Social and Health Services
- Benton, Franklin, and Walla Walla Counties Air Pollution Control Authority
- EPA Region X

MAJOR MILESTONES

- Submit RI Phase 1 and 2 Report to EPA/State of Washington Department of Ecology (FY 1991)
- Submit FS Phase 1 and 2 Report to EPA/State of Washington Department of Ecology for review (FY 1992)
- Submit FS Phase 3 Report to EPA/State of Washington Department of Ecology for review (FY 1992)

CONTINUATION

FUNDING

Funding By Priority Level
(Thousands of Dollars)

Year	Priority 1		Priority 2		Priority 3		Priority 4		Total	
	A*	C**	A	C	A	C	A	C	A	C
FY90	0	0	4,944	0	0	0	0	0	4,944	0
FY91B	0	0	5,494	0	0	0	0	0	5,494	0
FY92	0	0	4,370	5,000	0	0	0	0	4,370	5,000
FY93	0	0	1,460	10,860	0	0	0	0	1,460	10,860
FY94	0	0	0	12,830	0	0	0	0	0	12,830
FY95	0	0	0	37,800	0	0	0	0	0	37,800
FY96	0	0	0	37,800	0	0	0	0	0	37,800
FY 92-96 TOT	0	0	5,830	104,290	0	0	0	0	5,830	104,290

A* Assessment C** Cleanup

Grand Total 110,120

ROCKY FLATS OFFICE
INSTALLATION SUMMARY - ROCKY FLATS PLANT

RFP is located in northern Jefferson county, approximately 16 air miles northwest of Denver. The Plant covers almost 11 square miles. RFP's primary mission is to produce, in an environmentally sound manner, plutonium and other metal components for nuclear weapons. Key production activities involve component fabrication from plutonium, uranium, and nonradioactive metals. The Plant has specialized facilities for recovering nuclear components from obsolete weapons. Existing environmental contamination is the result of historical spills, disposal, and other waste management practices. Sites have been identified as OUs, which contain SWMUs to be remediated under either CERCLA or RCRA guidelines. RFP contains ten OUs that provide the basis for the recently signed Draft IAG. The IAG, once finalized, will provide the primary means of coordination of all ER activities at RFP among DOE, the State of Colorado, and EPA.

EXTENT/TYPES OF CONTAMINATION

The OUs at RFP include the following:

- OU 1 - 881 Hillside: VOCs and uranium occur in shallow groundwater in soils.
- OU 2 - 903 Pad, Mound, and East Trenches: VOCs and uranium occur in the shallow and bedrock groundwater systems and in the soils. Plutonium occurs in near-surface soils.
- OU 3 - RCRA Closures: Volatile organics, heavy metals, nitrates, and uranium occur in the groundwater and soils.
- OUs 4-10: Other contamination includes uranium, contaminated oils, burned oil residues, and radioactively contaminated used drums.

Among other sites under assessment in OU 4 are the Original Process Waste Line, Sanitary Landfill, Solar Ponds, West Spray Field, and Oxnard Facility.

Further definition of the nature and extent of contamination at RFP is continuing.

STATUS

- The initial site characterization work was completed in 1986. (See milestones for more detailed assessment.)
- Construction for an IRA is under way for OU 1 - 881 Hillside.
- RIs are under way for OU 1 - 881 Hillside and OU 2 - 903 Pad, Mound, and East Trenches.
- Contracting for the preparation of work plans to conduct RIs and RFIs is under way for all other OUs.
- Sitewide programs, including groundwater monitoring and background characterization, are ongoing.
- RCRA closure is under way for the Solar Ponds.

HEALTH RISKS

- No immediate health risks have been identified based on information available to date; however, health risks are not fully quantified pending ongoing background characterization programs and site-specific risk assessments.
- Primary concerns are VOC-contaminated groundwater that was the Number 1 DOE Environmental Survey finding within the Environmental Survey prioritization report.

SPECIAL CONSIDERATIONS

- Schedules contained within the Draft IAG are based on assumed periods for EPA and CDH reviews and approvals. Schedules may be impacted significantly should these periods be extended.
- RFP was placed on the NPL in 1989.
- An IRA is being performed on OU 1 and will likely be performed on OU 2.
- A major unresolved issue consists of defining the background levels of radionuclides and metals that will be required for final remediation.

REGULATORY DRIVERS

- Draft IAG among CDH, EPA, and DOE, December 1989
- RCRA
- CERCLA
- Colorado Hazardous Waste Management Act
- Agreement in Principle of June 16, 1989, between DOE and the State of Colorado
- DOE Orders

REGULATORY AUTHORITIES

- CDH
- EPA Region VIII

MAJOR MILESTONES

- Complete remediation of one task in FY 1990
- Start assessment of 13 tasks in FY 1990 and one task in FY 1993
- Complete assessment of one task in FY 1990, one task in FY 1992, two tasks in FY 1993, five tasks in FY 1995, and two tasks in FY 1996
- Begin remediation of three tasks in FY 1990, three tasks in FY 1991, two tasks in FY 1993, two tasks in FY 1994, one task in FY 1995, and one task in FY 1996

CONTINUATION

FUNDING

Funding By Priority Level
(Thousands of Dollars)

Year	Priority 1 A*	Priority 1 C**	Priority 2 A	Priority 2 C	Priority 3 A	Priority 3 C	Priority 4 A	Priority 4 C	Total A	Total C
FY90	1,627	4,052	23,171	28,964	0	0	0	0	24,789	33,016
FY91B	3,716	562	25,309	10,913	0	0	0	0	29,025	11,475
FY92	2,127	731	41,957	877	0	0	0	0	44,084	1,608
FY93	544	1,293	26,552	1,782	0	0	0	0	27,096	3,075
FY94	3	2,973	23,444	18,784	0	0	0	0	23,447	21,757
FY95	0	18,857	23,343	4,564	0	0	0	0	23,343	23,421
FY96	0	37,152	19,405	6,260	0	0	0	0	19,405	43,412
FY 92-96 TOT	2,674	61,006	134,701	32,267	0	0	0	0	137,375	93,273

A* Assessment C** Cleanup

Grand Total 230,648

SAN FRANCISCO OPERATIONS OFFICE
INSTALLATION SUMMARY - LAWRENCE LIVERMORE NATIONAL LABORATORY

LLNL, an energy and defense research facility, consists of the main Livermore Site and Site 300. The Livermore Site, 1 square mile in size, is located approximately 4 miles from Livermore, California, a city of approximately 50,000. Medium- and high-density housing is located on the west side of the facility; to north, south, and east are low-density industrial and agricultural areas. Site 300, 11 square miles in size, is a high-explosive testing facility located 15 miles east of the main site and is surrounded by low-density agricultural land. Facility, soil, and groundwater contamination was detected at both sites in the early 1980s (1983 at Livermore and 1982 at Site 300). Precleanup investigations have been ongoing since that time. The Livermore Site is on the NPL, and remediation is being conducted under CERCLA. Although Site 300 has been proposed for the NPL, remediation is being conducted under both RCRA and CERCLA.

EXTENT/TYPES OF CONTAMINATION

Livermore Site:
- VOCs have been found in groundwater 2000 ft outside the site boundaries.
- VOCs, metals, and tritium have been found in onsite soil and groundwater.

Site 300:
- TCE in groundwater has migrated offsite.
- VOCs, tritium, and high-explosive compounds have been found in onsite soil and groundwater.

STATUS

Livermore Site:
- The draft RI report was submitted to the regulatory agencies on December 1, 1989.
- The draft final baseline public health assessment was included in the draft RI.
- The draft FS report is in progress and is due to the regulatory agencies by July 1990.
- Two pilot groundwater extraction studies began operation in FY 1989: one in the southwest corner/offsite area and one at the gasoline spill area.

Site 300:
- Draft RI reports have been completed for four areas; an FS report has been completed for one area.
- The lateral and vertical extent of groundwater contamination has been determined for five areas.
- Two surface impoundments have been double-lined; nine have been capped.
- Four underground tanks have been removed.

HEALTH RISKS

- At the Livermore Site, spread of offsite VOC-contaminated groundwater plumes to municipal wells would pose a potential health risk.
- At Site 300, spread of offsite VOC-contaminated groundwater plumes to private water supply wells would pose a potential health risk.

SPECIAL CONSIDERATIONS

- The Livermore Site is listed on the NPL because of the proximity of groundwater contamination to municipal drinking water supplies.
- Site 300 has been proposed for the NPL because of the proximity of groundwater contamination to private drinking water supplies.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
• FFA with the State RWQCB, the State DHS, and EPA - Livermore Site • Proposed RCRA 3008(h) Order - Site 300 • Applicable California regulations • CERCLA • RCRA • DOE Order 5400.1 • DOE Order 5820.2A	• California Department of Health Services • California RWQCB • EPA Region IX

MAJOR MILESTONES	CONTINUATION
Livermore Site: • Complete testing and evaluation (FY 1990) • Complete final RI (FY 1990) • Complete draft FS (FY 1990) • Complete final FS (FY 1991) • Complete Proposed Remedial Action Plan (FY 1991) • Complete Remedial Action Implementation Plan (FY 1991) • Complete RA design (FY 1992) • Complete RA construction (FY 1996) • Complete RA implementation (FY 1996) (Continued)	Major Milestones (Continued) Site 300: • Complete RI/FS at Building 834 (FY 1990) • Complete RI/FS at Pit 7 (FY 1990) • Complete landfill closures (FY 1991) • Complete RI/FS at GSA offsite (FY 1991) • Complete RI/FS at Pit 6 (FY 1991) • Complete RI/FS at Building 850/EFA (FY 1991) • Complete RI/FS at Building 833 (FY 1991) • Complete RI/FS at HE process area (FY 1991) • Complete RA design (FY 1992) • Complete RA construction (FY 1993) • Complete RA implementation (FY 1993)

FUNDING

Funding By Priority Level
(Thousands of Dollars)

Year	Priority 1		Priority 2		Priority 3		Priority 4		Total	
	A*	C**	A	C	A	C	A	C	A	C
FY90	7,454	9,859	0	0	0	0	0	0	7,454	9,859
FY91B	8,070	10,500	0	0	892	0	0	0	8,962	10,500
FY92	5,650	22,700	0	0	2,000	6,500	0	0	7,650	29,200
FY93	2,600	19,500	0	0	0	6,000	0	0	2,600	25,500
FY94	2,100	16,250	0	0	0	0	0	0	2,100	16,250
FY95	1,900	15,000	0	0	0	0	0	0	1,900	15,000
FY96	1,900	14,700	0	0	0	0	0	0	1,900	14,700
FY 92-96 TOT	14,150	88,150	0	0	2,000	12,500	0	0	16,150	100,650

A* Assessment C** Cleanup

Grand Total 116,800

SAN FRANCISCO OPERATIONS OFFICE
INSTALLATION SUMMARY - ETEC, LBL, LEHR, AND SLAC

Five installations are within the jurisdiction of SAN: LLNL, LBL, SLAC, ETEC, and LEHR. The summary for LLNL is reported separately; the remaining installations are discussed in this summary. The mission of the LBL and SLAC facilities is scientific support to Energy Research programs. ETEC's mission is applied R&D support to Nuclear Energy programs. LEHR research activities ended in 1988. LBL is located on 130 acres of land leased from the University of California, Berkeley. SLAC occupies 426 acres of land owned by Stanford University. ETEC occupies 290 acres (shared with Rockwell International) of the Santa Susana Field Laboratory, 30 miles northwest of Los Angeles. LEHR is located on 15 acres leased from the University of California, Davis. SAN identified 42 ER activities among the 5 laboratories. Seventeen of the 42 are slated for funding in FY 1990. Remediation of the sites is being conducted under both CERCLA and RCRA.

EXTENT/TYPES OF CONTAMINATION

- LBL identified chlorinated hydrocarbons at concentrations above the State action levels in onsite groundwater. The scheduled closure of the existing tritium laboratory will result in tritium-contaminated facilities and equipment. Closure of the existing waste handling facility will be required when the new facility is available.
- SLAC is in the process of evaluating the extent and types of groundwater contamination that exist at the facility. PCB soil contamination has been identified.
- ETEC identified volatile organic constituents in onsite groundwater at concentrations above State action levels. The burn pit area contains radioactive contaminated materials. Activated steel and concrete are associated with Building 059. D&D of RMDF and the RI hot lab (Building 020) will also be required.
- LEHR will continue the ongoing site characterization activities to determine the extent and magnitude of contamination. D&D will be required for three buildings. Radioactive waste, an encapsulated Co-60 source, radioactive sludge from an underground Imhoff tank, and the Ra-226 septic tanks must all be removed.

STATUS

- LBL - Sampling activities related to the soil and groundwater assessment are under way. Closure of the tritium laboratory has been postponed; D&D is currently scheduled to be complete in FY 1993. The abandoned tank closure was completed in FY 1989.
- SLAC - Analysis of existing hydrogeological data has been completed for the groundwater assessment plan. The casting pad environmental improvement activity is ongoing and will be complete in FY 1990.
- ETEC - D&D of the RI hot lab (Building 020) is under way.
  FY 1989 activities included the initiation of decontamination of outside cell areas. D&D of Building 059 is also under way, with removal of activated steel and concrete scheduled for FY 1990. The preliminary surveys and assessments have been completed for Building 005.
- LEHR - The ongoing site characterization will be complete in FY 1991 if groundwater contamination is not found.

HEALTH RISKS

No immediate or short-term onsite or offsite health risks have been identified in connection with ER activities at LBL, SLAC, ETEC, or LEHR.

SPECIAL CONSIDERATIONS

LBL reported soil and water sampling results to the California RWQCB.

REGULATORY DRIVERS

- California Porter Cologne Act
- Bay Area AQMD Regulation No. 8
- RCRA
- CERCLA
- DOE Order 5400.1
- DOE Order 5820.2A

REGULATORY AUTHORITIES

- California Department of Health Services
- California RWQCB
- Bay Area Municipal Utility District
- County/City Regulatory Offices
- EPA Region IX

MAJOR MILESTONES

- Complete casting pad remediation, SLAC (FY 1990)
- Complete groundwater assessment, SLAC (FY 1991)
- Complete Area IV groundwater assessment, ETEC (FY 1991)
- Complete site characterization (if no groundwater contamination), LEHR (FY 1991)
- Complete site cleanup (if no groundwater contamination), LEHR (FY 1992)
- Complete D&D of Building 005, ETEC (FY 1992)
- Complete D&D of RI hot lab (Building 020), ETEC (FY 1993)
- Complete D&D of tritium facility, LBL (FY 1993)
- Complete sampling and assessment of soil and water contamination, LBL (FY 1993)
- Complete groundwater cleanup to acceptable level, LBL (FY 1995)

CONTINUATION

FUNDING

Funding By Priority Level
(Thousands of Dollars)

Year	Priority 1		Priority 2		Priority 3		Priority 4		Total	
	A*	C**	A	C	A	C	A	C	A	C
FY90	221	1,785	0	0	386	3,062	0	0	607	4,847
FY91B	4,565	1,915	0	0	1,150	2,356	0	0	5,715	4,271
FY92	1,968	2,294	0	0	480	16,316	82	2,059	2,530	20,669
FY93	4,427	0	0	0	480	6,780	0	3,359	4,907	10,139
FY94	3,423	0	0	0	180	1,967	0	2,471	3,603	4,438
FY95	2,931	0	0	0	180	2,200	0	882	3,111	3,082
FY96	241	0	0	0	180	150	0	0	421	150
FY92-96 TOT	12,990	2,294	0	0	1,500	27,413	82	8,771	14,572	38,478

A* Assessment C** Cleanup

Grand Total 53,050

SAVANNAH RIVER OPERATIONS OFFICE
INSTALLATION SUMMARY - SAVANNAH RIVER SITE

SRS is located on approximately 325 square miles along the Savannah River near Aiken, South Carolina. SRS produces nuclear materials, primarily tritium and plutonium, for national defense.

EXTENT/TYPES OF CONTAMINATION	STATUS
A total of 262 Waste Management Units have been identified at SRS, of which 183 are inactive and 19 are closed to date. The type of waste units ranges from hazardous/radioactive to nonhazardous/nonradioactive. Included are 3 burial grounds, 58 seepage/settling basins, 105 disposal pits/piles, 5 groundwater units, and 17 surface water units. The contaminants identified include VOCs, heavy metals, pesticides, and radionuclides.	· Closure of the M-Area Settling Basin/Lost Lake is 98 percent complete. Delay was due to bad weather and additional excavation. Closure is on schedule for FY 1990. · The closure plan for the F/H Seepage Basins was approved in June 1989. The basins are scheduled for closure in 1991. · Construction at the MWMF began in February 1989, including dynamic compaction, initial fill, and clay placement. Work will be complete December 1990. · The SRS received regulatory approval of the RFI Program Plan in September 1989. Unit RFI Plans are being prepared, and 16 will be submitted to the regulators in FY 1990. · Closure plans for the Met Lab Basin and the Acid/Caustic Basins were submitted to the State in June 1989. Complete closure of the SRL Seepage Basins is scheduled for FY 1992. · Groundwater contaminated with TCE is being pumped and treated in the A/M-Area. In FY 1990, a 400-gal/min air stripper will be increased to 610 gal/min to increase the zone of capture. · Site Assessment reports were submitted to the regulators for the SRL Seepage Basins and the New TNX Seepage Basins. · The SRS was placed on the NPL on December 21, 1989. SR is negotiating an FFA with EPA and the State.

HEALTH RISKS	SPECIAL CONSIDERATIONS
Health studies conducted by the CDC (reported in 1984) and the Savannah River EIS (published in 1987) did not identify any immediate or short-term onsite or offsite health risks.	The SRS was placed on the NPL in December 1989, and an FFA with SCDHEC and EPA Region IV is being negotiated. Many of the inactive waste units are already included under RCRA regulatory programs; however, under the FFA, all CERCLA requirements must also be addressed at these waste units. The SRS is currently under "Tiger Team" review through March 1990. The findings of the Tiger Team will also need to be incorporated into the Five-Year Plan. Several waste units are also the subject of a consent decree filed by the NRDC et al.; therefore, special budget and schedule commitments need to be considered for these sites.

REGULATORY DRIVERS

- FFA with SR, EPA Region IV, and SCDHEC
- South Carolina Waste Management Regulations
- RCRA/CERCLA
- RCRA 3004(u)
- Consent Order No. 85070-SW; groundwater monitoring for basins in M, F, and H Areas
- Settlement Agreement No. 86-52-W; periodic groundwater quality assessment
- Consent Decree pursuant to Civil Action No. 1:85-2583 between DOE/SCDHEC/NRDC
- Other RCRA Settlement Agreements
- Applicable State regulations

REGULATORY AUTHORITIES

- SCDHEC
- EPA Region IV

MAJOR MILESTONES

- Complete closure of the M-Area Settling Basin/Lost Lake (FY 1990)
- Increase flow of A/M-Area Air Stripper from 400 to 610 gal/min (FY 1990)
- Develop and submit 16 RFI Work Plans to the regulators (FY 1990)
- Submit draft closure plans for the SRL and New TNX Seepage Basins (FY 1990)
- Complete closure of the MWMF (FY 1991)
- Complete closure of the F/H Seepage Basins (FY 1991)
- Develop and submit 21 RFI Work Plans to the regulators (FY 1991)
- Complete installation of TNX groundwater recovery system (FY 1992)
- Develop and submit eight RFI Work Plans to the regulators (FY 1992)
- Complete removal of sludge from Types I and II tanks (FY 1997)

CONTINUATION

FUNDING

Funding By Priority Level
(Thousands of Dollars)

Year	Priority 1 A*	Priority 1 C**	Priority 2 A	Priority 2 C	Priority 3 A	Priority 3 C	Priority 4 A	Priority 4 C	Total A	Total C
FY90	9,659	27,025	750	20,912	200	2,316	0	0	10,609	50,253
FY91B	14,244	11,583	2,000	32,100	0	2,500	0	0	16,244	46,183
FY92	19,370	6,344	2,000	37,080	400	2,850	0	16,313	21,770	62,587
FY93	19,277	6,344	2,000	52,550	400	700	0	28,553	21,677	88,147
FY94	8,235	6,450	2,000	69,125	400	240	0	35,813	10,635	111,628
FY95	8,201	6,355	2,000	96,950	400	240	0	29,106	10,601	132,651
FY96	8,249	6,561	2,000	110,950	400	240	0	17,189	10,649	134,940
FY 92-96 TOT	63,332	32,054	10,000	366,655	2,000	4,270	0	126,974	75,332	529,953

A* Assessment   C** Cleanup

Grand Total 605,285

Attachment C

Waste Operations Summaries by Site

NOTE: Validated estimates for ER, WM, and CA have been identified that exceed the amount set forth for the FY 1991 President's budget by $605 million. $1,528 million of the total ER, WM, and CA estimates set forth for FY 1992 is unvalidated. The estimates set forth for FY 1993-1996 include both validated and unvalidated amounts. (See Section 1.2 regarding validated and unvalidated cost estimates.)

WASTE OPERATIONS FUNDING SUMMARY BY SITE
(Thousands of Dollars)

Operations Office/Installation	FY90	FY91B	FY92	FY93	FY94	FY95	FY96
Albuquerque Operations Office							
Kansas City Plant	4,067	5,160	14,305	12,055	15,328	8,828	31,028
Los Alamos National Laboratory	11,061	27,521	59,962	48,999	49,827	64,913	64,734
Mound Plant	4,205	5,085	12,419	26,769	19,985	7,331	7,358
Pantex Plant	1,983	3,004	26,338	9,333	13,638	9,949	16,492
Pinellas Plant	1,705	1,255	3,609	1,654	1,654	1,654	1,654
Sandia Nat. Lab.-AL & ITRI	4,582	5,105	29,468	31,332	46,875	26,488	27,771
Sandia National Laboratory-Livermore	2,266	795	1,775	1,354	1,436	1,446	1,446
Waste Isolation Pilot Plant	92,055	123,808	212,987	184,111	180,591	179,307	175,832
Albuquerque Other 1/	0	63	48,425	43,975	43,925	43,825	44,025
Albuquerque Total	121,924	171,796	409,288	359,582	373,259	343,741	370,340
Chicago Operations Office							
Chicago Combined Laboratories	10,916	17,178	19,291	17,627	25,635	25,471	37,568
Chicago Total	10,916	17,178	19,291	17,627	25,635	25,471	37,568
DOE Headquarters							
Office of Waste Operations	29,329	81,872	319,600	470,850	468,370	338,280	336,887
Headquarters Total	29,329	81,872	319,600	470,850	468,370	338,280	336,887
Idaho Operations Office							
Idaho National Engineering Laboratory	124,083	188,925	459,564	430,632	401,198	342,822	401,517
West Valley Demonstration Project	87,360	90,000	124,000	115,000	105,000	91,000	91,000
Idaho Total	211,443	278,925	583,564	545,632	506,198	433,822	492,517
Nevada Operations							
Nevada Test Site	6,488	8,609	22,824	23,409	25,434	18,774	15,754
Nevada Total	6,488	8,609	22,824	23,409	25,434	18,774	15,754
Oak Ridge Operations Office							
Feed Materials Production Center	29,717	33,020	44,043	46,123	127,332	110,085	99,402
Oak Ridge Gaseous Diffusion Plant	21,201	18,072	179,440	129,658	151,304	139,673	114,854
Oak Ridge National Laboratory	32,135	36,923	69,055	99,222	117,908	155,842	73,697
Paducah Gaseous Diffusion Plant	2,851	2,339	14,647	30,890	36,540	29,940	20,440
Portsmouth Gaseous Diffusion Plant	4,700	5,625	17,310	50,875	39,409	15,150	11,150
Y-12 Plant	44,784	40,621	127,548	120,824	175,987	152,828	222,760
Oak Ridge Other 1/	7,417	1,063	4,750	4,853	4,956	5,059	5,162
Oak Ridge Total	142,805	137,663	456,793	482,445	653,436	608,577	547,465
Richland Operations Office							
Hanford Reservation	324,709	499,667	1,047,740	1,085,559	1,155,479	1,063,099	895,655
Richland Total	324,709	499,667	1,047,740	1,085,559	1,155,479	1,063,099	895,655
Rocky Flats Office							
Rocky Flats Plant	76,267	47,292	118,293	156,524	147,964	142,365	129,042
Rocky Flats Total	76,267	47,292	118,293	156,524	147,964	142,365	129,042
San Francisco Operations Office							
SF Laboratories and Installations	18,925	15,716	53,774	88,929	78,753	58,130	48,024
San Francisco Total	18,925	15,716	53,774	88,929	78,753	58,130	48,024
Savannah River Operations Office							
Savannah River Site	374,396	476,235	720,172	667,404	766,002	728,684	718,070
Savannah River Total	374,396	476,235	720,172	667,404	766,002	728,684	718,070
TOTAL WASTE OPERATIONS	1,317,202	1,734,953	3,751,339	3,897,961	4,200,530	3,760,943	3,591,322

ALBUQUERQUE OPERATIONS OFFICE SITE SUMMARY

AL has the responsibility for WIPP, an R&D facility for demonstration of safe disposal of TRU waste resulting from defense activities. AL also is responsible for management of facilities located in eight states that constitute the nuclear weapons production complex. Pantex Plant in Texas, Pinellas Plant in Florida, Mound Plant in Ohio, Los Alamos National Laboratory in New Mexico, Sandia National Laboratories-Albuquerque in New Mexico, Inhalation Toxicology Research Institute in New Mexico, Sandia National Laboratories-Livermore in California, and Kansas City Plant in Missouri.

ACTIVITIES	STATUS
• TRU waste is generated, treated as appropriate, and either stored onsite or shipped to central storage facilities. Planning for eventual shipment of TRU wastes to WIPP continues. • LLW is generated, treated as appropriate, and either disposed of onsite or shipped to central disposal facilities. • HW is generated and shipped to offsite facilities for treatment and disposal (some wastes, such as LANL's, are handled onsite). • Mixed waste (TRU and LLW) is stored onsite pending the identification of appropriate waste management options. • Waste minimization programs are being implemented and are scheduled to be fully implemented and formally documented by the end of FY 1990. • Technologies directed toward potential application to TRU waste management are being developed; many are in the demonstration, testing, and evaluation phase. • Waste management facilities and equipment are being designed and constructed or enhanced, such as the Mixed Waste Facility at SNLA.	• Continuity of operations for handling radioactive, hazardous, and mixed waste is ongoing. • Waste Management at AL has been working with NV during FY 1989-1990 to characterize the AL contractors mixed waste for disposal at NTS. • Opening of WIPP is pending the complete satisfactory addressing of all regulatory issues. • The annual AL and AL contractor permitting status workshop is scheduled for 2Q FY 1990. • Waste Management at AL has begun planning a waste minimization workshop for the third quarter of FY 1990; successes, problems, measurement systems, and regulatory requirements will be emphasized.

REGULATORY DRIVERS

- CERCLA
- RCRA
- SARA
- CAA
- CWA
- SDWA
- FFCA
- NEPA
- 40 CFR Part 191
- TSCA
- HWSA
- NESHAP
- Various State's agreements and regulations

REGULATORY AUTHORITIES

- EPA Region IV, V, VI, VII, VIII, IX
- DOE
- NRC
- Various State Regulatory Agencies

MAJOR MILESTONES

- Complete hazardous waste facility upgrade, SNLL (3Q FY 1990)
- Obtain SEIS Record of Decision, WIPP (3Q FY 1990)
- Complete design and construction of a TRU waste treatment facility, LANL (4Q FY 1990)
- Set up explosive (reactive) hazardous waste storage area, SNLA (4Q FY 1990)
- Complete construction of wastewater recycling system for the Development High Explosive Machining Facilities, Pantex (1Q FY 1991)
- Obtain No Migration Variance Petition, WIPP (4Q FY 1991)
- Acquire prototype model of equipment and delivery for spray booths, KCP (FY 1991)
- Construct additional storage for LLW and TRU radioactive waste, Mound (FY 1991)
- Complete construction of the pH Neutralization Facility Upgrades, Pinellas (1Q FY 1992)
- Complete Waste Treatment and Storage construction, ITRI (3Q FY 1992)
- Complete distillation unit, Mound (FY 1992)

FUNDING

(Thousands of Dollars)

	EM
FY90	121,924
FY91B	171,796
FY92	409,288
FY93	359,582
FY94	373,259
FY95	343,741
FY96	370,340
FY92-96 TOT	1,856,210

REFERENCES

Environmental Restoration and Waste Management Site-Specific Plans for each facility

SPECIAL CONSIDERATIONS

ALBUQUERQUE OPERATIONS OFFICE
KANSAS CITY PLANT SUMMARY

KCP is part of the Bannister Federal Complex, located 13 miles south of downtown Kansas City. The KCP mission is the manufacture of nonnuclear weapon components involving machining, plastic fabrication, plating, and electrical and mechanical assembly. Waste management operations consist primarily of storage and preparation of all wastes generated for offsite shipment and disposal. Onsite wastewater treatment is also conducted for all aqueous plating, metal finishing, and industrial wastewaters. Minimization activities conducted under the current Five-Year Plan at KCP include the replacement and/or elimination of toxic and solvent-based hazardous materials.

ACTIVITIES	STATUS
• Hazardous and LLW/mixed waste from radiation sources, scintillation vials, and test equipment are stored in compliance with all applicable regulations. • KCP is pursuing a RCRA Part B Permit for the storage of hazardous, low-level, and mixed waste. • KCP established a formal waste minimization organization and identified related RDDT&E projects to modify process operations and to develop alternative materials to replace toxic and solvent-based chemicals used in production.	• A RCRA Part B Permit application has been submitted. • A revised RCRA Part A Permit application has been submitted to identify mixed waste storage facilities. • KCP initiated specific waste minimization projects, identified related resource and funding needs, and is progressing on schedule toward completion of these activities. • Problems have been encountered in receiving prototype models. Production units will be operational FY 1994.

REGULATORY DRIVERS

- RCRA
- TSCA
- CWA
- FFCA
- Missouri Air Pollution Control Regulations
- MDNR--Hazardous Waste Management Commission
- Montreal Protocol--Emission Reduction Requirements

REGULATORY AUTHORITIES

- EPA Region VII
- MDNR
- Kansas City, Missouri, Pollution Control Department

MAJOR MILESTONES

- Acquire prototype model of equipment and delivery for spray booths (FY 1991)
- Complete installation of nonhalogenated "solvent" cleaning process (prototype) equipment (4Q FY 1992)
- Complete preparations to ship mixed waste to an authorized disposal site (FY 1992)
- Obtain Part B Permit approval from EPA/MDNR (FY 1992)
- Evaluate prototype equipment for vapor-containing spray booths (FY 1993)
- Complete prototype facility to demonstrate usage of replacements for solvent-based materials (FY 1993)
- Begin production use of replacement materials and processes (FY 1995)

FUNDING

(Thousands of Dollars)

	EM
FY90	4,067
FY91B	5,160
FY92	14,305
FY93	12,055
FY94	15,328
FY95	8,828
FY96	31,028
FY92-96 TOT	81,544

REFERENCES

- KCP Waste Management Site Plan
- EPA/MDNR RCRA Part A & Part B Permit Application
- DOE-Tiger Team Findings, January 1990
- Environmental Restoration and Waste Management Site-Specific Plan, Albuquerque Operations Office, February 1990

SPECIAL CONSIDERATIONS

As KCP's waste minimization program is currently in the identification and development stages, funding and staffing requirements may increase significantly as related projects are more precisely defined.

ALBUQUERQUE OPERATIONS OFFICE
LOS ALAMOS NATIONAL LABORATORY SUMMARY

LANL is located in Los Alamos, New Mexico. Its primary mission is nuclear weapons R&D. Programs include weapons development, nuclear fission and fusion research, nuclear safeguards and security, and verification and control technologies. Basic research in the areas of physics is integral to LANL activities. Research on peaceful uses of nuclear energy has included space applications, power radiobiology, and medicine.

ACTIVITIES	STATUS
• Treatment of radioactive and mixed wastes is accomplished onsite, while most HW is shipped to offsite commercial contractors for treatment. • TRU waste is generated and stored in a retrievable manner pending shipment to WIPP. • LLW is generated, treated as appropriate, and disposed of in an onsite disposal facility. • Mixed LLW is stored onsite pending identification of an appropriate management option for these waste packages. • Waste minimization, brokering, and chemical substitution programs exist through generator interfacing.	• Design has begun for a LLW/mixed waste incinerator. • Design has been initiated for a TRU Waste Treatment Facility and for a Corrugated Metal Pipe Facility for handling TRU waste that was stored in a concrete matrix in metal pipes. • Procedures and facilities have been developed to ensure proper management, treatment, and disposal of solid radioactive and chemical waste. • Discussions have been initiated with NTS to explore the possibility of shipping certain mixed waste to that facility for disposal. The option of establishing an onsite RCRA-approved landfill is also being explored for the 1992 time frame. • Construction has begun on a project to expand the current LLW Disposal Facility. • Preliminary design has begun for a new Radioactive Liquid Waste Treatment Plant. • Design has begun on a Hazardous Waste Treatment Facility.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
• CWA • RCRA • CAA • NEPA • TSCA • FFCA • SDWA • New Mexico Water Quality Control Commission Regulations • New Mexico UST Regulations of 1988	• EPA Region VI • NMEID

MAJOR MILESTONES

- Complete construction of a new liquid waste transfer line between TA-55 and TA-50 (4Q FY 1990)
- Complete design and construction of a TRU waste treatment facility (4Q FY 1990)
- End construction of the LLW disposal facility expansion (4Q FY 1990); begin operations at the expanded LLW facility (1991)
- Complete Title I design of the new radioactive liquid waste treatment plant (FY 1994)

FUNDING

(Thousands of Dollars)

	EM
FY90	11,061
FY91B	27,521
FY92	59,962
FY93	48,999
FY94	49,827
FY95	64,913
FY96	64,734
FY92-96 TOT	288,435

REFERENCES

- Part B RCRA Permit
- Waste Minimization Plan
- Implementation Plan for DOE Order 5820.2A
- TSCA Permits
- NPDES Permit
- Environmental Restoration and Waste Management Site-Specific Plan, Albuquerque Operations Office, December 1989

SPECIAL CONSIDERATIONS

- LANL's wastewater treatment facilities are approximately 40 years old and are experiencing difficulty meeting discharge limitations. Replacement parts for these aged units are seldom available.
- Maintaining compliance while managing complex and ever-changing waste streams is difficult.

ALBUQUERQUE OPERATIONS OFFICE
MOUND PLANT SUMMARY

Mound, located in Miamisburg, Ohio, is an integrated research, development, and production facility performing work in support of DOE weapons and energy programs, with emphasis on explosives and nuclear technology. Missions include process development, production engineering, manufacturing, and surveillance of detonators, explosive timers, explosive actuated transducers, explosive pellets, nuclear components, and specific testing equipment.

ACTIVITIES	STATUS
• Mound generates small quantities of TRU waste that are solidified as required and stored, pending possible shipment to INEL for interim storage and ultimately shipment to WIPP for disposal. • LLW is treated to achieve volume reduction and is staged in engineered facilities, pending shipment to NTS for disposal. • Hazardous waste is sent to offsite EPA-approved vendors for treatment.	• Mound will begin operation of a distillation unit to reduce LLW waste volumes by FY 1992. • Mound is completing NEPA documentation for obtaining an EPA permit. • Mound is seeking authority to ship TRU waste to INEL for storage and mixed LLW to NTS for disposal. • Mixed waste is stored pending development of appropriate waste management alternatives. • Mound has received RCRA interim status from EPA. • Mound is negotiating the potential shipment of PCB-contaminated waste to LANL for treatment/disposal.

REGULATORY DRIVERS

- CERCLA
- RCRA
- HSWA
- NEPA
- SDWA

REGULATORY AUTHORITIES

- Ohio EPA
- EPA Region V

MAJOR MILESTONES

- Construct additional storage for LLW and TRU radioactive waste (FY 1991)
- Complete distillation unit (FY 1992)
- Start shipment of mixed LLW to NTS (3Q FY 1992)
- Be ready to ship PCB mixed waste to authorized disposal site (4Q FY 1992)
- Obtain Part B RCRA Permit (FY 1992)
- Complete design, installation, and testing of the incinerator (FY 1993)

FUNDING

(Thousands of Dollars)

	EM
FY90	4,205
FY91B	5,085
FY92	12,419
FY93	26,769
FY94	19,985
FY95	7,331
FY96	7,358
FY92-96 TOT	72,862

REFERENCES

Environmental Restoration and Waste Management Site-Specific Plan, Albuquerque Operations Office, December 1989

SPECIAL CONSIDERATIONS

ALBUQUERQUE OPERATIONS OFFICE
PANTEX PLANT SUMMARY

The mission of Pantex, located near Amarillo, Texas, is to assemble, retrofit, maintain, repair, and retire nuclear weapons in the stockpile. In addition to this primary mission, Pantex manufactures high-explosive components for nuclear weapons, and weaponlike devices for testing and training programs; provides development support to design agencies and other government entities; performs RTG shelf-life activities; and procures parachutes for DOE weapons.

ACTIVITIES	STATUS
• Hazardous materials are generated in conjunction with the explosives development, testing, and formulation activities at Pantex. • LLW and mixed waste are generated from nuclear weapons testing and decommissioning activities. • No Class I hazardous material is disposed of onsite. All Class I materials are shipped to offsite vendors for processing and disposal. • Waste minimization efforts are being started to reduce and/or recycle discharges from high explosive and heavy chemical user facilities. • Increases in secondary containment features for chemical and waste staging areas are being developed.	• General Base Program activities under waste management are continuing as planned. This includes disposal of hazardous waste at offsite facilities and disposal of LLW at NTS. • Procurement processing is under way for solvent recovery equipment used in the high-explosive synthesis process. • Procurement of a Chemical Control and Inventory Tracking Computer is on hold, pending FY 1990 funding. • The design was completed in October 1989 for the Wastewater Recycling System.

REGULATORY DRIVERS

- 40 CFR 112
- 40 CFR 265
- 40 CFR 268
- RCRA
- RCRA Closure Regulations
- Texas Solid Waste Disposal Act
- Texas Air Control Board Regulation I
- Texas Air Control Board Regulation III
- DOE Order 5820.2A

REGULATORY AUTHORITIES

- EPA Region VI
- Texas Water Commission
- Texas Air Control Board
- Texas Department of Health

MAJOR MILESTONES

- Complete construction of wastewater recycling system for the Development High Explosive Machining facility (1Q FY 1991)
- Complete construction of zero discharge system for a laboratory and explosive batch processing area (4Q FY 1991)
- Complete construction of secondary containment for several burning ground and explosive processing areas (4Q FY 1991)
- Complete demolition of the Building 11-44 hazardous waste unit (4Q FY 1991)
- Procure Chemical Control and Inventory Tracking Computer (4Q FY 1991)
- Complete demolition of the hazardous waste unit at Building 12-43 (4Q FY 1992)
- Procure and install solvent recovery equipment for the High Explosive Synthesis Facility (4Q FY 1992)
- Design additional secondary containment construction (FY 1993)
- Design the High Explosive Incinerator (FY 1995), starting construction (FY 1996)

FUNDING

(Thousands of Dollars)

	EM
FY90	1,983
FY91B	3,004
FY92	26,338
FY93	9,333
FY94	13,638
FY95	9,949
FY96	16,492
FY92-96 TOT	75,750

REFERENCES

- Environmental Restoration and Waste Management Site-Specific Plan, Albuquerque Operations Office, December 1989
- Tiger Team Environment, Safety, and Health Assessment of Pantex Plant (Draft), October 1989
- Action Plan for Tiger Team Environment, Safety, and Health Assessment of Pantex Plant (Draft), December 1989

SPECIAL CONSIDERATIONS

Pantex has some classified waste that is contaminated with lead or other LDR materials. A significant funding shortfall has been identified for FY 1990 due to several activities that occurred after the original Five-Year Plan date. These activities increased estimates for Waste Management. Cleanup costs for the accidental tritium release that occurred during the summer of FY 1989 have been included in current base program costs. Activities needed to rectify Headquarters Tiger Team findings have been added to this Five-Year Plan. Also, cost estimates related to volumes and costs for handling hazardous wastes were understated in the original Five-Year Plan. The costs have been re-evaluated for this Five-Year Plan and included in the base programs.

ALBUQUERQUE OPERATIONS OFFICE
PINELLAS PLANT SUMMARY

The primary mission of Pinellas, located near St. Petersburg, Florida, is the development and manufacture of special electronic and mechanical nuclear weapons components. Although the neutron generator remains the primary product, the Plant's mission has expanded to include the manufacture of radioisotopically powered thermoelectric generators and specialty capacitors, lightning arrestor connectors, vacuum switch tubes, and magnetic devices. Additionally, Pinellas supports process development, design, laboratory, and production activities and the design and fabrication of product testing systems. Waste management operations provide support to all of these mission activities.

ACTIVITIES	STATUS
• Pinellas uses thermal treatment to destroy explosive materials. • Reactive metals are chemically treated using water in a reaction vessel. • Flammable liquids, halogenated hydrocarbons, and other HW are stored in Building 1040 until a large enough quantity has been accumulated to make offsite shipment and disposal cost effective. • LLW is stored in Building 1000 until a full load has been accumulated for shipment to SRP for disposal.	• Upgrade of the pH Neutralization Facility is scheduled to be completed in FY 1990. Present efforts are focused on selection of an engineering firm to design the required system improvements. • Removal of an underground 1000-gal diesel fuel storage tank is scheduled for completion in FY 1990. Present efforts are focused on selection of an engineering firm to design the replacement tank.

REGULATORY DRIVERS

- CERCLA
- CAA
- CWA
- RCRA
- Florida Administrative Rule, Chapter 17-61

REGULATORY AUTHORITIES

- EPA Region IV
- Florida Department of Environmental Regulation
- Pinellas County Air Quality Division
- Pinellas County POTW

MAJOR MILESTONES

- Upgrade the pH Neutralization Facility
  - Complete design (2Q FY 1990)
  - Complete design criteria (3Q FY 1990)
  - Complete construction (1Q FY 1992)

  Remove/Replace USTs
  - Complete design (2Q FY 1990)
  - Complete design criteria (3Q FY 1991)
  - Complete construction (1Q FY 1992)

FUNDING

(Thousands of Dollars)

	EM
FY90	1,705
FY91B	1,255
FY92	3,609
FY93	1,654
FY94	1,654
FY95	1,654
FY96	1,654
FY92-96 TOT	10,225

REFERENCES

Environmental Restoration and Waste Management Site-Specific Plan, Albuquerque Operations Office, December 1989

SPECIAL CONSIDERATIONS

The Pinellas Plant is located in proximity to a heavily populated residential area. Thus, close monitoring and control of environmental releases are of utmost importance.

ALBUQUERQUE OPERATIONS OFFICE
SANDIA NATIONAL LABORATORIES-ALBUQUERQUE AND INHALATION TOXICOLOGY RESEARCH INSTITUTE SUMMARY

AL installations located in Albuquerque, New Mexico, are SNLA, whose primary mission is nuclear weapons development and engineering, and ITRI, whose mission is investigating the nature and magnitude of human health effects from the inhalation of airborne materials.

ACTIVITIES	STATUS
• Construct Rad/Mixed Waste Storage Facility (SNLA) • Begin waste minimization through Chemical Exchange Program (SNLA) • Form MinNet (SNLA) • Replace PCB electrical transformers (ITRI) • Upgrade Waste Storage and Treatment Building (ITRI) • Remove Asbestos (ITRI)	• The RCRA Part A Permit application for mixed waste has been prepared and will be submitted in FY 1990 (SNLA). • The Chemical Exchange Program was initiated in August 1989. A total of $21,000 in cost savings was realized, and 1,200 kg of wastes was avoided in 6 months (SNLA). • Line organizations now participate in MinNet to determine ways to minimize hazardous waste (SNLA). • Pathological wastes that do not contain radioactive or hazardous waste are thermally destroyed onsite (ITRI). • Generator's Application for disposal of low-level radioactive waste at the Nevada Test Site has been submitted in accordance with NVO-325 (ITRI). • A formal waste minimization program will be established in FY 1990 (SNLA). • No hazardous or radioactive wastes are disposed of onsite (ITRI). • A quantity of actinide-containing LSC vial wastes (137 drums) are presently stored onsite for commercial treatment and disposal (ITRI).

REGULATORY DRIVERS

- TSCA
- RCRA
- HSWA
- New Mexico Hazardous Waste Management Regulations
- DOE Orders

REGULATORY AUTHORITIES

- EPA Region VI
- NMEID
- DOE
- DOT
- NRC
- City of Albuquerque

MAJOR MILESTONES

- Set up explosive (reactive) hazardous waste storage area, SNLA (4Q FY 1990)
- Implement Chemical Exchange with external agencies, SNLA (4Q FY 1990)
- Implement Wastewater Data Automation, SNLA (4Q FY 1990)
- Dispose of 137 drums of actinide-LSC vial wastes (FY 1990)
- Complete removal of PCB transformers, ITRI (1Q FY 1991)
- Complete asbestos removal, ITRI (4Q FY 1991)
- Complete Waste Treatment and Storage Construction, ITRI (3Q FY 1992)
- Construct Rad/MW Assay and SNM Storage Facilities, SNLA (4Q FY 1992)
- Complete Construction of HW Support Building, SNLA (4Q FY 1992)
- Construct Sewer Line for Tech Area V, SNLA (FY 1993)
- Install HW Warehouse monitoring equipment, SNLA (FY 1994)
- Remove, replace, or retrofit 30 USTs, SNLA (FY 1995)
- Document MW Facility upgrades, SNLA (FY 1996)

FUNDING

(Thousands of Dollars)

	EM
FY90	4,582
FY91B	5,105
FY92	29,468
FY93	31,332
FY94	46,875
FY95	26,488
FY96	27,771
FY92-96 TOT	161,934

REFERENCES

- 1990 Waste Management Plan for Sandia National Laboratories-Albuquerque
- Waste Minimization and Pollution Prevention Awareness Plan for Sandia National Laboratories-Albuquerque
- Environmental Protection Implementation Plan, Sandia National Laboratories-Albuquerque
- Environmental Restoration and Waste Management Site-Specific Plan (December 1989)
- ITRI Hazardous Waste Implementation Plan (November 1983)
- ITRI Radioactive Waste Management Implementation Plan (April 1989)
- ITRI Site Waste Management Plan (December 1989)

SPECIAL CONSIDERATIONS

- New land disposal restrictions concerning laboratory packs place severe constraints on the types of laboratory packs and alternatives to disposal.
- No disposal options exist for mixed wastes.
- Limited market for certain recycled wastes exists.
- No characterization or packaging capabilities exist for old, noncertifiable wastes, and high-activity wastes.

ALBUQUERQUE OPERATIONS OFFICE
SANDIA NATIONAL LABORATORIES-LIVERMORE SUMMARY

SNLL consists of R&D laboratories dedicated to the design and testing of nonnuclear components of nuclear weapons systems. A significant fraction of R&D at SNLL is devoted to energy-related programs in the Combustion Research Facility. New R&D programs under development are related to hazardous waste management. Hazardous waste activities include handling, packaging, and storing radioactive, mixed, and nonradioactive hazardous waste. There is no history of onsite treatment or disposal. All the radioactive wastes generated onsite are LLW. Radioactive wastes are sent to the NTS for burial, and all nonradioactive wastes are sent to permitted commercial facilities for treatment or disposal. A waste minimization program has been developed at SNLL.

ACTIVITIES	STATUS
Radioactive/Mixed wastes: · Radioactive wastes - tritium-contaminated waste · Small amounts of depleted uranium · Minimal amounts of MW · MW stored onsite until commercial MW disposal facility available · Replacement of gas purification and waste recovery system Hazardous Wastes: · Acids, bases, solvents, oils, and chemically contaminated equipment · PCB control program to remove all PCB transformers · About 348 cubic meters chemical waste generated in FY 1989 · New laboratories to cause overall increase in hazardous waste in future · Waste minimization program to reduce waste volumes wherever possible · Upgrades to the waste storage facilities	· The hazardous waste program is an ongoing program required for completion of SNLL's mission. · Liquid effluent from some of the chemical laboratories is diverted to a LECS. · LECS water is tested before being released to the sanitary sewer. · Contaminated water is disposed of as hazardous waste.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
· Title 22, California Code of Regulations · DOE NVO-325 · DOE Orders, 5400 series · 40 CFR, Part 265 · RCRA	· California Department of Health Services · EPA Region IX

MAJOR MILESTONES

- Complete hazardous waste facility upgrade (3Q FY 1990)
- TLR gas purification and waste recovery system
  - -Complete design (4Q FY 1990)
  - -Complete system fabrication (4Q FY 1991)
  - -Install/test complete system (4Q FY 1992)

All other hazardous, radioactive, and mixed waste activities are ongoing and have no milestones associated with them. The ongoing activities are tracked through regularly generated annual, semiannual, and quarterly reports.

FUNDING

(Thousands of Dollars)

	EM
FY90	2,266
FY91B	795
FY92	1,775
FY93	1,354
FY94	1,436
FY95	1,446
FY96	1,446
FY92-96 TOT	7,457

REFERENCES

- Waste Management Site Plan SNL-Livermore
- Environmental Restoration and Waste Management Site-Specific Plan, Albuquerque Operations Office, December 1989

SPECIAL CONSIDERATIONS

- LDR - major economic impact
- Results of Tiger Team audits
- Effects from the Agreement in Principle

ALBUQUERQUE OPERATIONS OFFICE
WASTE ISOLATION PILOT PLANT SUMMARY

WIPP, 26 miles east of Carlsbad, New Mexico, is an R&D facility intended to demonstrate the safe disposal of radioactive TRU wastes resulting from the Nation's defense activities and programs. It is the only facility in the United States specifically designed and constructed for the disposal of TRU wastes. WIPP is essential to the national defense programs and is a solution to the growing problem of how to safely and efficiently dispose of radioactive waste in an environmentally sound manner. WIPP is designed to receive, handle, and provide permanent isolation for defense-generated TRU waste. This waste is generated at other DOE facilities and is planned to be transported by truck to WIPP.

ACTIVITIES	STATUS
• Continue to perform R&D activities to gather data necessary to support the performance assessment and to prove and confirm the viability of WIPP • Complete the FSAR and obtain approval before WIPP becomes operational • Complete SEIS and issue a ROD before WIPP becomes operational • Design, test, and procure the TRUPACT II fleet that will be used for shipping waste to WIPP • Comply with all applicable environmental regulations	• The FSAR has been drafted and is in the approval process. • The SEIS has been completed (January 1990). A ROD is in the review process. • The TRUPACT II has received a Certificate of Compliance from the NRC (August 1989). • A No-Migration Variance petition has been prepared by DOE and reviewed by EPA. Approval will clear the way for MW to be received at WIPP. • Funding was obtained for road construction from the State of New Mexico (FY 1989). • Major construction was completed (April 1989). • Land withdrawal legislation was prepared (September 1989).

REGULATORY DRIVERS

- RCRA
- NEPA
- Federal Land Policy and Management Act
- 40 CFR Part 191
- CAA
- Stipulated Agreement with the State of New Mexico

REGULATORY AUTHORITIES

- NMEID
- EPA Region VI

MAJOR MILESTONES

- Obtain FSAR approval (2Q FY 1990)
- Obtain SEIS ROD (3Q FY 1990)
- Issue Plan for WIPP Test Phase (3Q FY 1990)
- Complete TRUPACT fleet (3Q FY 1991)
- Obtain ESAAB decision (3Q FY 1990)
- Obtain No-Migration Variance Petition (4Q FY 1990)

FUNDING

(Thousands of Dollars)

	EM
FY90	92,055
FY91B	123,808
FY92	212,987
FY93	184,111
FY94	180,591
FY95	179,307
FY96	175,832
FY92-96 TOT	932,828

REFERENCES

- DOE/EIS-0026: FEIS, WIPP (October 1980)
- DOE/EIS SEIS, WIPP, 1989 (*in process*)
- Draft Decision Plan for WIPP (Rev 3, April 20, 1990)
- Environmental Restoration and Waste Management Site-Specific Plan, Albuquerque Operations Office, December 1989

SPECIAL CONSIDERATIONS

CHICAGO OPERATIONS OFFICE

AMES LABORATORY, ARGONNE NATIONAL LABORATORY-EAST, ARGONNE NATIONAL LABORATORY-WEST, BROOKHAVEN NATIONAL LABORATORY, FERMI NATIONAL ACCELERATOR LABORATORY, PRINCETON PLASMA PHYSICS LABORATORY

CH, located in Chicago, Illinois, is responsible for waste management operations at six different Government-owned, contractor-operated sites: (1) Ames Laboratory in Ames, Iowa; (2) ANL-E, near Chicago; (3) ANL-W, near Idaho Falls, Idaho; (4) BNL, near Upton, New York; (5) Fermi, west of Chicago; and (6) PPPL, in Princeton, New Jersey. CH's primary objective is basic and applied research in a variety of fields of interest to DOE and the public. Some of the activities are RD&D in support of the Nation's fast reactor program and research in the fundamental properties of matter; physical, life, and environmental sciences; magnetic confinement fusion; and high-energy physics. The RD&D activities conducted at the laboratories are the principal sources of radioactive and hazardous wastes.

ACTIVITIES	STATUS
· Contractors generate CH and RH TRU, LLW, and hazardous and mixed wastes. · Radioactive waste is disposed of at Hanford or INEL. · HW is disposed of by licensed vendors. · Waste management facilities are being upgraded. · RD&D is being conducted in chemical separation technologies, HLW chemical durability, halocarbon streams, and reactive metals.	· ANL-E is in the design stage for upgrading the waste management facility. (WMFU) · Startup of the SPF at ANL-W was delayed because the recipient could not accept shipment. Startup is scheduled for June 1990. · BNL is in the Title I design stage for the WMFU. · The test Plan for the HLW leaching studies is complete. · Assessments of the CH installations for waste minimization will begin in 4Q FY 1990.

REGULATORY DRIVERS

- DOE Order 5820.2A
- DOE Order 5400.1
- DOE Order 5400.3
- 40 CFR 260-280
- WIPP/DOE 069
- Illinois Solid Waste Rules and Regulations
- INEL Consent Order and Compliance
- Suffolk County Sanitary Code
- RCRC
- TSCA

REGULATORY AUTHORITIES

- EPA Regions II, V, VII, X
- Illinois EPA
- Idaho Office of Health and Welfare
- New York Dept. of Environmental Conservation
- Iowa Dept. of Natural Resources
- New Jersey Department of Environmental Protection

MAJOR MILESTONES

- Start up the SPF, ANL-W (FY 1990)
- Complete HLW Leaching Studies Test Plan (FY 1990)
- Complete WMFU design at ANL-E (1Q FY 1991)
- Complete the WMFU upgrade, ANL-E (4Q FY 1991)
- Complete WMFU at BNL (FY 1992)
- Complete waste minimization assessment of CH installations (FY 1992).

FUNDING

(Thousands of Dollars)

	EM
FY90	10,916
FY91B	17,178
FY92	19,291
FY93	17,627
FY94	25,635
FY95	25,471
FY96	37,568
FY92-96 TOT	125,592

REFERENCES

Environmental Restoration and Waste Management Site-Specific Plan, Chicago Operations Office, December 1989

SPECIAL CONSIDERATIONS

DOE HEADQUARTERS
OFFICE OF WASTE OPERATIONS

The Office of Waste Operations has the responsibility for managing CA and WO within the Office of Environmental Restoration and Waste Management and is responsible for oversight of CA and WO activities directly managed by other DOE Programs. These responsibilities include the day-to-day operation of the waste management systems throughout the DOE complex as well as support of special programs, studies, and task teams. Funding at the HQ level includes management contingency reserves, contractor and task team support, special programmatic projects, and activities that have not yet been assigned to a specific field office.

ACTIVITIES	STATUS
• Programmatic direction of the TRU, Low-Level, High-Level, Mixed, and Hazardous Waste Management Program • Programmatic direction of the operational Waste Minimization Program • Programmatic direction of the EM Corrective Activities Program • Programmatic direction of the Landlord Programs at Idaho, Hanford, and (in FY 1992) the Oak Ridge Gaseous Diffusion Plant • Budget preparation, support, and execution • Policy formulation, coordination, and implementation • Coordination with other Headquarters offices on environmental and regulatory compliance issues • Coordination with DOE field offices on operational, regulatory, compliance, environmental, budget, and policy issues	• Created task force to address alternate storage requirements for Rocky Flats TRU wastes • Conducted study for Public Law 99-240 implementation for greater-than-Class C waste management • Created task force to investigate gas generation in Hanford Double Shell HLW Storage Tank • Prepared special report on Land Disposal Restricted Waste within DOE complex • Developed waste minimization implementation plans for all Field Offices and installations • Created task force to develop and manage the WIPP Decision Plan • Coordinated site ADSs for CA and WO for the update to the Five-Year Plan • Initiated Waste Management Modernization planning effort • Provided support for the five-year planning process and Programmatic EIS

REGULATORY DRIVERS	REGULATORY AUTHORITIES
• 10 CFR • 40 CFR • DOE ES&H Order • DOE Orders on Construction Projects • DOE Policy Notice on ES&H, OSHA, Nuclear Safety, and NEPA	• EPA Headquarters and regional offices • NRC Headquarters • State and local governments

MAJOR MILESTONES

- LDR radioactive MW data base established for National Report (2Q FY 1990)
- Publish Five-Year Plan (2Q FY 1990)
- Submit radioactive Mixed Waste Treatment and Disposal Capabilities report to EM-30 (3Q FY 1990)
- Issue Draft Integrated Data Base Annual Report (3Q FY 1990)
- Complete Environmental Assessment from Transuranic Waste Alternative Storage (4Q FY 1990)
- Issue Summary Report on Field Compliance Order 5820.2A (4Q FY 1990)
- Determine facility requirements and locations for waste analytical laboratory (4Q FY 1990)
- Complete removal of cesium capsules from RSI-Decatur Facility (4Q FY 1990)
- Complete removal of cesium capsules from RSI Westerville Facility (1Q FY 1991)

FUNDING

(Thousands of Dollars)

	EM
FY90	29,329
FY91B	81,872
FY92	319,600
FY93	470,850
FY94	468,370
FY95	338,280
FY96	336,887
FY92-96 TOT	1,933,987

REFERENCES

SPECIAL CONSIDERATIONS

The staff and funding provided at Headquarters for this activity are directly responsive to DOE management, other executive branch organizations (e.g., OMB, EPA, DOD, DOI, DOT), the Congress, and the public.

IDAHO OPERATIONS OFFICE SITE SUMMARY

INEL site facilities were originally dedicated to development, testing, and processing of fuel in conjunction with nuclear reactor and reactor safety system testing. More recently, programs at the site became more diversified to include R&D in the environmental, material, and computer sciences; the National Low-Level Waste Management Program; and the waste management program that encompasses waste minimization, T/S/D, nondestructive examination, operations continuity, R&D, and program support elements. Currently, DOE is stressing the need for additional waste management enhancements and waste cleanup in a safe and effective manner that protects the general public, plant employees, and the environment.

ACTIVITIES	STATUS
• INEL generates predominantly HLW and LLW. Almost all the HLW generated is MW that is stored onsite. Hazardous waste that is generated is treated and disposed of by licensed operators offsite. A small portion of the mixed LLW generated is processed through WERF at INEL. The remainder will be stored onsite until safe treatment and disposal methods are developed. Sanitary waste is treated and disposed of onsite. • HLLW generated by fuel processing is stored in stainless steel tanks contained in concrete vaults until calcined into a solid for safe interim storage pending final disposition. • TRU waste is stored on asphalt pads. After retrieval, real-time radiography, assay, and container integrity checks, it is stored indoors to await shipment for offsite disposal. • Approximately one-half of the LLW is processed by incineration, compaction, or sizing to reduce volume and stabilize the waste to the extent possible before disposal onsite. The other half is disposed of directly. Hazardous materials are prohibited from the disposed LLW. Enhanced confinement of LLW in a new disposal facility is being pursued. • HW and mixed hazardous wastes are stored onsite for processing or until offsite disposal becomes available.	• NWCFs will resume waste processing in July 1990 and are scheduled to operate for 15 months to reduce the HLW volumes and produce stable calcine. Several long campaigns are scheduled for the 1990s. • Stored TRU waste characterization was started in September 1989. • Conceptual design of the new TRU Waste Treatment and Storage Facility was initiated in FY 1989. • WERF is operational for mixed waste. • TRU waste storage and processing capabilities are being developed in preparation for eventual offsite shipment and disposal at WIPP. • Processing capabilities for some mixed wastes are available at WERF. • LLW for disposal is being minimized, and disposal is being upgraded to meet or exceed new regulatory requirements both at the current and proposed new LLW disposal site. • A DOE Order 5820.2A-required implementation plan has been developed and issued to Headquarters. Elements of that plan are being initiated in FY 1990.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
• EPA Region X COCA • 463 Agreement between DOE and Governor Andrus dated December 1988 • DOE Order 5820.2A • RCRA mixed hazardous waste requirements • DOT 40 CFR 172 and 173 regulations pursuant to DOE 1540.1 shipping requirements • Applicable State regulations	• State of Idaho • DOE Headquarters • EPA Region X

MAJOR MILESTONES	FUNDING
• Calcine 3884 cubic meters of HLLW (FY 1990-1992) • Complete construction of first Type II TRU storage module (4Q FY 1991) • Complete construction of TRU waste retrieval containment facility (4Q FY 1991) • Complete HLW tank Phase I Title I and II design (FY 1992) • Hot start PREPP (R&D only) (FY 1992) • Obtain RCRA Permit for new sanitary landfill and complete construction (FY 1992) • Complete LLW Disposal System Conceptual Design Report (FY 1993) • Complete ID Waste Processing Facility Title I design (FY 1993) • Complete design of ID Waste Processing Facility Title II (FY 1994) • Complete TRU Waste Characterization and Storage Facility (4Q FY 1994) • Complete construction of HLW tank farm replacement project Phase I (FY 1998)	(Thousands of Dollars) EM FY90 124,083 FY91B 188,925 FY92 459,564 FY93 430,632 FY94 401,198 FY95 342,822 FY96 401,517 FY92-96 TOT 2,035,733

REFERENCES	SPECIAL CONSIDERATIONS
• ICPP Radioactive Waste Management Plan, February 1990 • Extended Research and Development/Idaho Defense HLW Technology Program, 1989 Version, WIN-260 • INEL DOE Order 5820.2A, Implementation Plan, DOE/ID-10231, April 1988 • INEL Waste Management Plan (Draft), Annual Update, February 1990 • "463 Agreement" between DOE and Governor Andrus, December 1988 • Environmental Restoration and Waste Management Site-Specific Plan, Idaho Operations Office, December 1989	• Assistance to States and Indian Tribes to support permitting and oversight • EPA support in review and approval of environmental documentation • Adequate manpower and subcontractor availability for requisite activities

IDAHO OPERATIONS OFFICE
WEST VALLEY DEMONSTRATION PROJECT OFFICE
SUMMARY

The West Valley Demonstration Project is carried out at the Western New York Nuclear Service Center located in Cattaraugus County, near West Valley, New York. WVDP Act (PL 96-368) was enacted to demonstrate solidification techniques that can be used to prepare high-level radioactive waste for disposal. Additional waste management programs at the site include waste minimization, reduction, treatment, and storage, as well as programs for site characterization, site cleanup, decontamination and decommissioning of facilities, and shipment of HLW to the repository. Currently the project is stressing continued waste management enhancements and waste cleanup in a safe and effective manner that protects the general public, plant employees, and the environment.

ACTIVITIES	STATUS
• The WVDP is reducing in volume 600,000 gal of liquid HLW before solidifying it in a form suitable for disposal. • The LLW produced in concentration of the HLW activity is solidified and placed in long-term storage onsite. • An expanded environmental monitoring program is being developed to achieve full compliance with DOE Order 5400.1 • A major FY 1990 effort is preparation for vitrification, with areas of emphasis being facility construction and equipment installation. • Activities for FY 1991 are completion of design, procurement, installation, and testing of the sludge washing equipment.	• Fifty percent of the HLW was reduced in volume at the end of December 1989. • Construction and equipment installation will continue in preparation for vitrification operations. • Design, procurement, installation, and testing of the sludge washing equipment are to be completed in FY 1990. • Preparation and filing of a RCRA Part A Permit for radioactive mixed waste is to be completed by 3Q FY 1990. • Processing supernatant through the integrated Radwaste Treatment System and handling and storage of LLW will continue. Ten thousand drums of decontaminant supernatant are to be processed through FY 1990.

REGULATORY DRIVERS

- Public Law 96-368
- MOU between DOE and NRC
- Cooperative agreement with New York State Energy Research and Development Authority
- Negotiated agreement between DOE, EPA, and New York State Department of Environmental Conservation. (Target for reaching this agreement is 4Q FY 1990)
- Compromise Settlement (May 1987) between DOE (defendant) and the Coalition of West Valley Nuclear Waste (plaintiffs) which directs DOE to include LLW and TRU waste disposition in a planned EIS for Phase II operations, project closure

REGULATORY AUTHORITIES

- NRC (MOU 1981)
- New York Department of Environmental Conservation
- EPA

MAJOR MILESTONES

- Obtain WVDP RCRA Part A Permit for mixed waste (3Q FY 1990)
- Obtain WVDP RCRA Part B Permit for mixed waste (3Q FY 1991)
- Complete the Vitrification Facility Construction per the FY 1991B funding level (FY 1994)
- Publish Phase II EIS (FY 1994)
- Start Vitrification Hot Operations (FY 1995)
- Publish ROD on Phase II Environmental Impact (FY 1995)
- Complete Vitrification Hot Operations (FY 1996)
- Prepare Comprehensive Project Completion Plan (FY 1996)

FUNDING

(Thousands of Dollars)

	EM
FY90	87,360
FY91B	90,000
FY92	124,000
FY93	115,000
FY94	105,000
FY95	91,000
FY96	91,000
FY92-96 TOT	526,000

REFERENCES

- WVDP Five-Year Site-Specific Plan
- WVDP Project Management Plan
- WVDP Major System Acquisition Plan

SPECIAL CONSIDERATIONS

- Activities have been replanned to ensure adequate funding for increased scope in ES&H activities, compliance with Tiger Team issues, and compliance with changes in EPA regulations and DOE Orders.
- Agreement being negotiated with EPA and New York State Department of Environmental Conservation may affect the schedule of the milestones.

NEVADA OPERATIONS OFFICE SITE SUMMARY

The missions of the Waste Management Operations at NTS are to dispose of DP LLW and MW from NTS operations and 17 offsite generators, support the Nuclear Radiological Emergency Response capability, and conduct tests involving liquified gaseous releases.

ACTIVITIES	STATUS
• NTS generates and manages low-level, mixed, hazardous, and sanitary wastes. (No HLW or TRU wastes are generated at NTS). • NTS stores TRU waste generated by LLNL in Livermore, California. • NTS disposes of low-level and mixed waste generated at NTS and mixed waste generated by 16 offsite facilities. Both low-level and mixed wastes are disposed of by shallow land burial. Mixed wastes from these facilities will be disposed of when proper NEPA documentation is completed and the appropriate State permits are received. • Waste minimization activities in FY 1989 included elimination of some facilities, replacement of hazardous materials with nonhazardous ones, the sale or transfer of unused products, recycling of certain materials, and the installation of oil change systems.	• In FY 1989, over 600,000 cubic feet of waste was disposed of, the bulk from the Atmospheric Test Debris Disposal Program. • Over 1,300 containers of hazardous wastes were located, sampled, analyzed, and properly disposed of in FY 1989. • A draft environmental monitoring plan for Defense Waste Continuity of Operations was prepared, and generator applications were received from the State regulatory authority. • A RCRA Closure Plan for U3axbl was submitted to the State regulatory authority. Closure of this site will be delayed about 1 year pending the review of this plan. • Routine maintenance for the TRU storage pad is continuing. • The Draft Waste Minimization plan was prepared and is in review. • An estimated 1,200,000 cubic feet of LLW will be disposed of in FY 1990. • An estimated 543,000 cubic feet of MW will be disposed of in FY 1990. • A Draft Agreement-in-Principle was developed and is under review; negotiations with the regulatory authority are ongoing. • NV is assessing greater confinement disposal compliance with 40 CFR 191 for Defense TRU waste that cannot be certified for disposal at WIPP. • Completion of the hazardous waste storage pad was delayed 9 months.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
· RCRA (40 CFR 260-270) · State of Nevada environmental laws and regulations · DOE Orders 5400.w, 5480.2A, and 5820.2A · 40 CFR 191	· EPA Region IX · State of Nevada, Department of Conservation and Natural Resources, Division of Environmental Protection

MAJOR MILESTONES

- Sign Agreement-in-Principle (2Q FY 1990) -- new milestone
- Complete construction of Hazardous Waste Storage Pad (3Q FY 1990)
- Complete Environmental Monitoring Plan (3Q FY 1990) -- new milestone
- Complete Performance Assessment of Area 5 RWMS (3Q FY 1990) -- new milestone
- Finalize waste minimization plan (3Q FY 1990)
- Complete installation of filtered vents of TRU packages (4Q FY 1991)
- Receive RCRA Permit from the State of Nevada for the Mixed Waste Management Unit (1Q FY 1992)
- Close mixed waste management unit U3axb1 (4Q FY 1992)
- Close U3AHAT (FY 1994) -- new milestone
- Close Area 5 MW cells (FY 1994) -- new milestone
- Complete Performance Assessment for 40 CFR 191 (FY 1994) -- new milestone
- Close Area 5 RWMS Pit 4 (FY 1995) -- new milestone
- Complete shipment of stored waste to WIPP (FY 1995) -- new milestone

FUNDING

(Thousands of Dollars)

	EM
FY90	6,488
FY91B	8,609
FY92	22,824
FY93	23,409
FY94	25,434
FY95	18,774
FY96	15,754
FY92-96 TOT	106,195

REFERENCES

- Draft Environmental Assessment of Proposed Mixed Waste Management Unit at Area 5 Radioactive Waste Management Site, Nye County, Nevada
- Part B Permit Application for the Mixed Waste Management Facility, Nevada Test Site, Mercury, Nevada
- DOE Order 5820.2A Implementation Plan for the Nevada Test Site
- Waste Management Plan for the Nevada Test Site, Defense Waste Management, December 1988
- Draft Safety Analysis Report for the Defense Waste Management Department
- NVO-325, Nevada Test Site Defense Waste Acceptance Criteria and Transfer Requirements, October 1988
- Environmental Restoration and Waste Management Site-Specific Plan, Nevada Operations Office, December 1989

SPECIAL CONSIDERATIONS

The disposal of TRU wastes may require extensive site characterization and performance assessment to fulfill the requirements of 10 CFR 191. An RDDT&E activity will help to define alternatives to the present concepts for the disposal of these wastes.

OAK RIDGE OPERATIONS OFFICE SITE SUMMARY

The six OR facilities, FMPC, ORGDP, ORNL, PGDP, PORTS, and Y-12 were originally dedicated to the production of fissile materials for national defense. In later years, programs at the sites became more diversified to include R&D for other purposes; that is, production of medical radioisotopes, development of power reactor fuels, life and physical science research, enrichment of uranium for commercial reactors, and the manufacture of components for other defense agencies. Some of the work associated with these facilities is now focused on RD&D of waste treatment technologies for radioactive, hazardous, and mixed waste streams for DOE and other Federal agencies.

ACTIVITIES	STATUS
• Waste characterization and waste warehousing to meet RCRA requirements (FMPC) • Planning and operation of waste management activities for low-level radioactive, mixed, hazardous, and industrial sanitary waste (all sites) • Operation of the Oak Ridge Filter Test Facility, K-1407-H Central Neutralization Facility, K-1232 Wastewater Treatment Facility, and K-1203 Sewage Treatment Plant (ORGDP) • Demonstration of greater confinement disposal technologies (ORNL) • Disposal of conventional wastes in onsite landfills or scrap yards (PGDP) • Installation of a radioactive waste incinerator for handling nonhazardous contaminated waste (PORTS) • Construction of a LLW Disposal Facility (PORTS) • Replacement of PCB transformer to reduce the risk of fire (PORTS) • Development and operation of Production Waste Treatment Facility, Sanitary and Industrial Wastewater Treatment Project, and the Production Waste Storage Facility (Y-12)	• Recoverable uranium residues have been reclassified as waste, which will delay reduction of the backlog waste inventory (FMPC). • Low-level, PCB, and mixed wastes are being monitored and stored in 22 locations at ORGDP, awaiting identification of disposal alternatives. • Two facilities are being designed for construction and operation in FY 1994-1997 to provide adequate disposal capacity for LLW for up to 40 years (ORGDP). • Construction will begin on a mixed waste storage upgrade of Building 7507 (ORNL). • Demonstrations of alternative greater confinement disposal technologies are being conducted (ORNL). • Work will be completed this year on the interactive LLW data base (ORNL). • Siting studies for a new LLW disposal facility are in progress (PGDP). • Existing waste storage facilities are being upgraded, and planning for additional waste storage capacity has begun (PGDP). • The project to replace the PCB transformer is ongoing (PORTS). • The LLW scrap metal recovery project is pending, awaiting DOE bid review (PORTS). • A waste storage facility for mixed hazardous waste is being designed and constructed (Y-12). • Five onsite wastewater treatment facilities are now operational (Y-12). • The Preliminary LDR for the WHPP was completed in May 1989 (ORNL). • The LDR for the LLWDDD Interim Waste Facilities was completed in 1989.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
• Ohio EPA • Kentucky Solid Waste Regulations • State MOUs • State Commissioners Orders • TDHE Complaints and Orders • TSCA/State Regulations, RCRA/State Regulations • CAA, CWA • HSWA • CERCLA/SARA • AEA • NPDES Permits • NEPA, NESHAP • DOE Orders • FFAs, FFCAs, Administrative Consent Order (EPA, DOE)	• EPA Regions IV and V • Kentucky Department for Environmental Protection • Kentucky Division of Water • Ohio EPA • TDHE • OSHA

MAJOR MILESTONES	FUNDING
• Complete CDR for ORGDP LLW Disposal Facilities (2Q FY 1990) • Complete construction of second tumulus, ORNL (4Q FY 1990) • Complete construction of RCRA Warehouse, FMPC (FY 1990) • Complete the hazardous/mixed waste storage facility design and construction, PORTS (FY 1990) • Issue CDR for the Production Waste Treatment Facility, Y-12 (1Q FY 1991) • Complete design criteria for LLW Disposal Facilities, ORGDP (1Q FY 1991) • Complete final CDR for WHPP, ORNL (2Q FY 1991) • Complete replacement of Liquid LLW Evaporator Vessel, ORNL (2Q FY 1991) • Complete construction of PCB/Hazardous Waste Storage Building 7602, ORNL (4Q FY 1991) • Complete shipping dock upgrades, FMPC (FY 1991) • Complete construction of Storage Facility upgrade, PGDP (FY 1991) • Replace PCB transformer, PORTS (FY 1991) • Implement the Waste Tracking Program, Y-12 (3Q FY 1992) • Complete construction of SPAD Leachate Treatment Facility, Y-12 (FY 1993)	(Thousands of Dollars) EM FY90 — 142,805 FY91B — 137,663 FY92 — 456,793 FY93 — 482,445 FY94 — 653,436 FY95 — 608,577 FY96 — 547,465 FY92-96 — 2,748,716

REFERENCES	SPECIAL CONSIDERATIONS
• FMPC 2114, Environmental, Safety, Health and Waste Management Plan, April 1988 • ORNL-6446/R1 and ORNL 6445/R1, ORNL Long-Range Environmental and Waste Management Plan • K/HS-93, Rev 3, ORGDP Long-Range Environmental and Waste Management Plan, September 1989 • K/HS-285, DOE Order 5820.2A (Radioactive Waste Management) Waste Management Plan, December 1989 • Y/TS-83, Rev. 6, Y-12 Plant Long-Range Environmental and Waste Management Plan • Y/TS-438, Implementation Plan for Development Demonstration and Selection of Treatment and Disposal Methods for Y-12 Low-Level Wastes • Radioactive Waste Management Implementation Plan for the Paducah Gaseous Diffusion Plant • ES/ESH-10, POEF-2011, LLWDDD, Radioactive Waste Management Implementation Plan for Portsmouth Gaseous Diffusion Plant, April 1989 • Environmental Restoration and Waste Management Site-Specific Plan, Oak Ridge Operations Office, December 1989	• Y-12 is committed to stop using Bear Creek Burial Grounds and to identify alternatives. • The NPDES Permit to be negotiated in 1993 is expected to be more stringent (Ohio). • Funding of $78 million is required to comply with the FMPC lawsuit settlement.

OAK RIDGE OPERATIONS OFFICE
FEED MATERIALS PRODUCTION CENTER SUMMARY

FMPC, located in Fernald, Ohio, has been the source of uranium feed materials for DOE nuclear weapons production complexes since the early 1950s. Waste management activities involving characterization, minimization, and T/S/D are built upon a foundation of program continuity that encompasses training, program management, compliance, quality assurance, and other indirect support functions.

ACTIVITIES	STATUS
• RCRA compliance for waste characterization and waste warehousing • Worker safety in handling radioactive materials • LLW management • Thorium material warehouse disposition	• Reclassification of formerly classified recoverable uranium residues to waste requires extensive RCRA characterization and additional RCRA warehousing. • RCRA classification will delay reduction of backlog LLW inventory.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
• TSCA • RCRA • Consent Decree Section IV, Control of Wastewater and Runoff, Tasks 4.1-4.4 • NPDES • CERCLA • CWA • DOE Orders	• Ohio EPA • EPA Region V • DOE

MAJOR MILESTONES	FUNDING
• Complete construction of the RCRA warehouse (FY 1990) • Complete shipping dock upgrades to more effectively stage and inspect waste before shipment (FY 1991) • Complete conversion and restoration of additional RCRA warehouse (FY 1993) • Process and dispose of 82,000 drum equivalents of LLW (backlog) (FY 1993)	(Thousands of Dollars) EM FY90 29,717 FY91B 33,020 FY92 44,043 FY93 46,123 FY94 127,332 FY95 110,085 FY96 99,402 FY92-96 TOT 424,986

REFERENCES	SPECIAL CONSIDERATIONS
• FMPC 2114, Environment, Safety, Health, and Waste Management Plan, April 1988 • DOE Order 5820.2, Radioactive Waste Management • Environmental Restoration and Waste Management Site-Specific Plan for the Feed Materials Production Center, December 1989	• Multiple deadlines in the agreements, decrees, and regulations would be affected by insufficient funding. Violations of these agreements, decrees, and regulations could occur if this funding is deferred or delayed. • Funding is required to comply with the lawsuit settlement agreement, which calls for the establishment of a $78 million fund for medical monitoring and payment of claims for violations of air and water quality in areas adjacent to the Plant. • Advanced wastewater treatment studies exist of best available technology for treating FMPC effluent to comply with DOE-derived concentration guidelines limits and to improve NPDES compliance.

OAK RIDGE OPERATIONS OFFICE - OAK RIDGE GASEOUS DIFFUSION PLANT

The ORGDP facilities were the first production plants of the uranium enrichment complex built in the 1940s and 1950s to produce weapons-grade material for national defense. The mission of ORGDP has been reoriented into one of technology development, work for other DOE and DOD contractors, and interim waste storage for OR facilities. The wastes being stored on an interim basis are LLW awaiting identification of a final disposition strategy, PCB/uranium-contaminated wastes, and other mixed wastes awaiting future incineration in the new K-1435 TSCA Incinerator.

ACTIVITIES	STATUS
• Generation, treatment, storage, and disposal of low-level, classified, hazardous, mixed, PCB, and sanitary wastes • Minimization of the amount of wastes generated and requiring treatment, storage, or disposal • Development of new and improved waste disposal facilities for the management of low-level solid wastes generated on the Oak Ridge Reservation • Operation of the ORFTF to provide QA inspection and testing of HEPA filters procured for DOE facilities east of the Mississippi River • Preparation of a CDR for the LLWDF • Operation of the K-1407-H Central Neutralization Facility, K-1232 Wastewater Treatment Facility, and K-1203 Sewage Treatment Plant to treat wastewater streams • Operation of K-1435 TSCA Incinerator	• Low-level, PCB, and mixed wastes are being monitored and stored in 22 locations at ORGDP awaiting identification and completion of disposal alternatives. • Treatment of wastewater is being conducted at the K-1407-H Central Neutralization Facility, K-1232 Wastewater Treatment Facility, and K-1203 Sewage Treatment Plant to comply with the NPDES discharge limits. • Investigations of treatment alternative waste minimization activities are planned to reduce the volume of waste already generated, including use of commercial compactors for volume reduction, RCRA delisting of various sludges, and upgrade of the K-1421 Incinerator to burn LLW combustibles. • Two facilities are being designed for construction and operation in FY 1994-1997 to provide adequate disposal capacity for Class I and Class II LLW for up to 40 years. • Radiological performance assessments and waste certification program development are also under way. • The ORFTF staff expects to test and inspect between 5,200 and 6,200 filters in FY 1990 supply replacement filters and provide emergency services to all eastern DOE facilities. • The CDR for the LLWDDD Interim Waste Facilities was completed in 1989. • TSCA Incinerator is ready for restart, awaiting approval from DOE Readiness Review Boards. • The CDR for the LLW Interim Waste Facilities was completed in 1989.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
• Federal and Tennessee RCRA • Federal and Tennessee TSCA • DOE Orders • DOE Policy Document NE F 3-42 • AEA	• TDHE • EPA Region IV

MAJOR MILESTONES	FUNDING
• Complete CDR for ORGDP LLWDF (2Q FY 1990) • Submit draft EIS for Oak Ridge Reservation Waste Management Activities milestone moved from ORNL WM activities (4Q FY 1990) • Complete full-scale waste burns of the TSCA Incinerator (4Q FY 1990) • Complete mixed waste disposal facility feasibility study (1Q FY 1992) • Complete CDR for mixed waste disposal facilities (FY 1993) • Complete Title I and II design for the LLWDF (FY 1993) • Complete beneficial occupancy of the Class I and Class II LLWDF disposal facilities (FY 1996) • Complete construction of LLWDF (FY 1998)	(Thousands of Dollars) EM FY90 21,201 FY91B 18,072 FY92 179,440 FY93 129,658 FY94 151,304 FY95 139,673 FY96 114,854 FY92-96 TOT 714,929

REFERENCES	SPECIAL CONSIDERATIONS
• Environmental Restoration and Waste Management Site-Specific Plan for ORGDP, December 1989 • K/HS-233, ORGDP Hazardous Waste Development Demonstration and Disposal (HAZWDDD) Implementation Plan, September 1988 • K/HS-2335, ORGDP Site-Specific Low-Level Waste Disposal Development Demonstration (LLWDDD) Implementation Plan, October 1988 • K/HS-281, Oak Ridge Gaseous Diffusion Plant, DOE Order 5820.2A, Radioactive Waste Management Implementation Plan, April 1989 • B.V. Wojtowicz, Waste Minimization Plan for the Oak Ridge Gaseous Diffusion Plant, April 7, 1989 • K/HS-285, DOE Order 5820.2A (Radioactive Waste Management) Waste Management Plan, December 1989 • ORGDP, Reservation Waste Management Division Current Year Work Plan for FY 1990, Transmittal No. RWMD:89-011, draft, November 3, 1989 • K/D-5832, Conceptual Design Report for the Low-Level Waste Disposal Facilities, February 1990	

OAK RIDGE OPERATIONS OFFICE
OAK RIDGE NATIONAL LABORATORY SUMMARY

ORNL, located near Oak Ridge, Tennessee, is a multiprogram laboratory that conducts R&D. Originally (1943), as part of the Manhattan Project, ORNL was dedicated to operate the Graphite Reactor and an associated nuclear fuel reprocessing pilot plant for obtaining information for the design of the Hanford facilities. The diversity of current R&D programs and the legacy of past activities continue to present diverse and unique environmental and waste management challenges. Recent inspections, audits, and reviews have revealed the need to accelerate environmental compliance activities to bring ORNL into conformance with current and future regulations and guidelines.

ACTIVITIES

- Routine waste collection, transfer, storage, and treatment are provided.
- Interim waste operations activities include the development of waste management strategies and improved waste systems operation demonstrations.
- The liquid LLW Collection and Transfer Systems are being upgraded to meet FFA requirements.
- Additional management capability for ORNL CH and RH TRU waste is being provided.
- Support activities include critical data base management, waste minimization, WHPP management, and minority educational institutions interaction.
- Activities will demonstrate greater confinement disposal technologies of aboveground tumulus and belowgrade silo techniques.

STATUS

- Improvements are being made to waste systems operations such as upgrades to waste management facilities, preparation of enhanced safety and quality assurance documentation, and continued operator training.
- Construction will begin on a mixed waste storage upgrade of Building 7507.
- Demonstrations of alternative greater confinement disposal technologies are being conducted.
- Work will be completed this year on the interactive liquid LLW data base.
- Conceptual Design of the Waste Characterization and Certification Facility (which will replace the inadequate Waste Examination and Assay Facility) will begin in FY 1991.
- The Preliminary CDR for WHPP was completed in May 1989.
- Preoperational testing for use of nitric acid in regeneration of the Process Water Treatment Plant was successfully completed in 1989.
- The Preliminary CDR for the RH TRU WHPP was completed in May 1989.
- A formal waste minimization program was established in 1989.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
· NPDES · NESHAP · DOE Orders · NEPA · CAA · TSCA · RCRA	· TDHE · EPA Region IV

MAJOR MILESTONES	FUNDING
· Submit draft EIS for Oak Ridge Reservation Waste Management Activities (This milestone was moved to ORGDP WM activities.) · Issue TRU Waste Management Strategic Plan (2Q FY 1990) · Complete conceptual design for Melton Valley liquid LLW-CAT System upgrades (3Q FY 1990) · Complete construction of second tumulus (4Q FY 1990) · Begin shipment of ORNL waste to TSCA for treatment (4Q FY 1990) · Complete final CDR for WHPP (2Q FY 1991) · Complete final CDR for RH TRU WHPP (2Q FY 1991) · Complete conceptual design of the Waste Characterization and Certification Facility (2Q FY 1991) · Complete replacement of liquid LLW Evaporator Vessel (2Q FY 1991) · Complete construction of the Interim Waste Management Facilities (4Q FY 1991) · Complete construction of expanded mixed waste storage (Building 7668), upgrade Building 7507 to permit storage of contaminated lead, complete construction of PCB/Hazardous Waste Storage Building 7652 (4Q FY 1991) · Complete construction of Bethel Valley LLLW-CAT line item (4Q FY 1992) · Complete WHPP detailed design (FY 1995)	(Thousands of Dollars) EM FY90 32,135 FY91B 36,923 FY92 69,055 FY93 99,222 FY94 117,908 FY95 155,842 FY96 73,697 FY92-96 TOT 515,724

REFERENCES	SPECIAL CONSIDERATIONS
· ORNL-6446/R1 and ORNL-6445/R1, ORNL Long-Range Environmental and Waste Management Plan · ORNL, Low-Level Waste Disposal, Development Plan and Demonstration (LLWDDD) Implementation Plan · Environmental Restoration and Waste Management Site-Specific Plan for ORNL, December 1989	· Environmental-based activities currently funded through overhead include activities such as general environmental monitoring and operation of the decontamination laundry. · ORNL maintains the Integrated Data Base, which provides information on spent fuels and all forms of radioactive waste (i.e., inventories, projections, characteristics, and sources from all DOE field offices).

OAK RIDGE OPERATIONS OFFICE
PADUCAH GASEOUS DIFFUSION PLANT SUMMARY

PGDP, located near Paducah, Kentucky, is a uranium enrichment facility consisting of a diffusion cascade and extensive support facilities. Hazardous, nonhazardous, radioactive, and mixed wastes have been generated and disposed of as a result of plant operations. Waste management plans include upgrading and developing waste storage and disposal facilities. Recovery of contaminated scrap metal is a planned DOE initiative.

ACTIVITIES	STATUS
• PGDP generates and manages low-level radioactive, hazardous, PCB, mixed, and conventional wastes. • Low-level radioactive and mixed wastes are stored in aboveground facilities. Some mixed wastes will be treated in the Oak Ridge TSCA Incineration Facility. • Hazardous and PCB wastes are disposed of by incineration offsite. • Conventional wastes are disposed of in onsite landfills or scrap yards.	• Siting studies for a new LLW Disposal Facility are in progress. Design will begin in FY 1993. • Existing waste storage facilities are being upgraded. • Planning for a new waste storage facility has begun, and construction will begin in FY 1992. • Plans are being made to characterize mixed wastes for treatment at Oak Ridge. • Instrumentation for monitoring containerized waste for radionuclides is being tested before installation. • Support for the Oak Ridge scrap metal decontamination program is being provided. • A waste minimization program is being developed.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
• TSCA • RCRA • Kentucky Solid Waste Regulations • DOE Orders	• EPA Region IV • Kentucky Department for Environmental Protection • Kentucky Division of Water

MAJOR MILESTONES	FUNDING
• Complete construction of Storage Facility upgrade (FY 1992) • Complete design of LLW Disposal Facility (FY 1993) • Complete design of New Storage Facility (FY 1993) • Complete construction of New Storage Facility (FY 1994) • Complete construction of LLW Disposal Facility (FY 1995)	(Thousands of Dollars) EM FY90 2,851 FY91B 2,339 FY92 14,647 FY93 30,890 FY94 36,540 FY95 29,940 FY96 20,440 FY92-96 TOT 137,647

REFERENCES	SPECIAL CONSIDERATIONS
• DOE Order 5820.2A • Radioactive Waste Management Implementation Plan for the Paducah Gaseous Diffusion Plant • DOE Order 5400.3 • Environmental Restoration and Waste Management Site-Specific Plan for Paducah Gaseous Diffusion Plant, December 1989	

OAK RIDGE OPERATIONS OFFICE
PORTSMOUTH GASEOUS DIFFUSION PLANT (PORTS)
SUMMARY

PORTS is located near Portsmouth, Ohio. The principal onsite process at PORTS is the separation of uranium isotopes through gaseous diffusion. This process produces enriched uranium, which is used for nuclear fuel in commercial power plants and for military purposes. The site covers 3,700 acres (including 93 acres for the process buildings).

ACTIVITIES	STATUS
• Treat mixed waste/radioactive waste • Install a radioactive waste incinerator for handling nonhazardous contaminated waste from PORTS and PGDP • Install equipment to encapsulate solid and liquid radioactive nonhazardous waste • Install a hazardous/mixed waste area to meet RCRA and TSCA requirements • Replace the PCB transformer to reduce the risk of fire • Transfer recovered contaminated scrap metal to vendor for decontamination and resale • Calcine X-705 waste to reduce volume of waste and number of treatment steps	• Pollution abatement, effluent, and waste treatment facilities are being operated. • Waste quantification, characterization, and alternatives studies have been pending PORTS radioactive waste incinerator project. • Hazardous/mixed waste storage facility CDR will be submitted in FY 1990. • PCB transformer project is ongoing. • LLW scrap metal recovery project is pending DOE bid review. • EPA approval of stack monitoring for X-705 waste is pending.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
• Ohio EPA Requirements • TSCA 40 CFR 760-764 • RCRA 40 CFR 260-273 • Consent Decree between DOE and State of Ohio, August 1989 • DOE Orders • CAA • CWA • Administrative Consent Order between EPA and DOE under Section 3008(h) of RCRA, as amended, 42 USC Sections 6928(h) and 106(a) of CERCLA	• Ohio EPA • EPA Region V • OSHA • DOE

MAJOR MILESTONES	FUNDING
• Complete the Radioactive Waste Incinerator Conceptual Design and Safety Analysis Report (FY 1990) • Complete construction of the Hazardous/Mixed Waste Storage Facility (4Q FY 1991) • Replace PCB transformer (FY 1991) • Complete Title II design of Waste Encapsulation Project (4Q FY 1992)	(Thousands of Dollars) EM FY90 4,700 FY91B 5,625 FY92 17,310 FY93 50,875 FY94 39,409 FY95 15,150 FY96 11,150 FY92-96 TOT 133,894

REFERENCES	SPECIAL CONSIDERATIONS
• LLWDDD Radioactive Waste Management Implementation Plan for Portsmouth Gaseous Diffusion Plant, ES/ESH-10, POEF-2011, April 1989 • HAZWDDD Hazardous Waste Development & Disposal Program Plan, ES/ESH-6/VI, February 1989 • Los Alamos Technical Associates, Feasibility Study Report for FY 1992 LI Project Portsmouth Gaseous Diffusion Plant Incinerator 8-1989, POEF-E-384 • Engineering Risk Assessment X-800 Steam Plant • Reports on Contaminated Scrap Metal Recovery Program; Uranium Enrichment Program Request for Technical Proposal - November 1988 • Environmental Restoration and Waste Management Site-Specific Plan for Portsmouth Gaseous Diffusion Plant, December 1989	The new NPDES permit to be negotiated in 1993 will likely have more stringent water quality limits requiring improvement and upgrades to existing facilities.

OAK RIDGE OPERATIONS OFFICE
Y-12 PLANT SUMMARY

The Oak Ridge Y-12 Plant, located near Oak Ridge, Tennessee, was originally constructed for the U.S. Army Corps of Engineers in 1943 as part of the Manhattan Project to separate fissile isotopes of uranium (^{235}U) using the electromagnetic process. The Y-12 Plant progressed from its single mission of 1943 to become a highly sophisticated nuclear weapons component manufacturing and development organization. Today's primary missions include the production of nuclear weapons components, support to DOE weapon design laboratories, processing of source and special nuclear materials, and support to other Federal agencies. Modernization planning is under way to ensure continued weapons production capability.

ACTIVITIES	STATUS
• PWTF consists of four subprojects: (1) Packaging, Certification, and Staging Facility; (2) Industrial Waste Compaction Facility; (3) Classified Waste Treatment Facility; and (4) Oil/Solvent Treatment Facility. • PWTF Phase II consists of three subprojects: (1) Sludge and Soil Processing Facility (2) Class III LLW Treatment Facility, and (3) Decontamination Facility. • Sanitary and Industrial Wastewater Treatment Project will improve the sanitary sewers, provide a treatment facility for Y-12 sanitary sewer water, and eliminate the overload and possible uranium contamination of the Oak Ridge Wastewater Treatment Plant. • PWSF will provide storage for solid, hazardous, low-level radioactive, and mixed wastes. Subprojects consist of the Y-12 Classified Solid Waste Storage Facility, the TSCA Ash Storage Facility, the Y-12 WETF Head End Modifications, and the Sludge Storage Facilities.	• A new generation of LLW management facilities is under development. • The treatment of hazardous wastes for commercial disposal is being pursued. • A waste storage facility for mixed hazardous waste is being designed and constructed. • Five onsite wastewater treatment facilities are now operational. • Work will be completed this year on the CDR for the PWTF. • The first Draft Y-12 Plant Waste Minimization Plan was issued in July 1989.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
• TDHE Complaints and Orders • TDHE Commissioner's Orders • MOU (DOE, EPA, TDHE) • FFCA • NPDES Permit • DOE Orders • TSCA • RCRA • CERCLA • NEPA • CWA	• TDHE • EPA Region IV

MAJOR MILESTONES

- Complete construction of Groundwater Treatment Facility (2Q FY 1990)
- Issue CDR for PWTF (1Q FY 1991)
- Complete Sanitary and Industrial Wastewater Treatment Project CDR (2Q FY 1991)
- Complete design of PWSF (1Q FY 1992)
- Implement the waste tracking program (3Q FY 1992)
- Complete conceptual design PWTF Phase II (1Q FY 1993)
- Initiate demonstrations for Commercial Treatment of Mixed Wastes:
  -Ship wastes for LLW volume reduction (4Q FY 1991)
  -Award contract for proposal for new sanitary landfill (1Q FY 1992)
  -Award contract for treatment of mixed waste soils (2Q FY 1992)
  -Award contract for treatment of mixed waste sludge (2Q FY 1992)
- Complete construction of SPAD Leachate Treatment Facility (3Q FY 1993)
- Complete CDR for EUDOR (FY 1994)
- Complete subproject construction for the PWSF (FY 1994)
- Complete Sanitary and Industrial Wastewater Treatment Project construction (FY 1996)

FUNDING

(Thousands of Dollars)

	EM
FY90	44,784
FY91B	40,621
FY92	127,548
FY93	120,824
FY94	175,987
FY95	152,828
FY96	222,760
FY92-96 TOT	799,947

REFERENCES

- Y/TS-83, Rev. 6, Y-12 Plant Long-Range Environmental and Waste Management Plan
- Y/IA-196, Characterization and Identification of Y-12 Plant Wastes Stream Candidates for Commercial Treatment and Disposal
- Y/TS-438, Implementation Plan for Development, Demonstration, and Selection of Treatment and Disposal Methods for Y-12 Low-Level Wastes
- Environmental Restoration and Waste Management Site-Specific Plan for the Y-12 Plant, December 1989

SPECIAL CONSIDERATIONS

- Funding is provided for the proper handling of all wastes generated from current Y-12 Plant operations.
- Y-12 is committed to stop using Bear Creek Burial Grounds and to identify alternative disposal methods for LLW. Data collection and technology demonstration will support design of new LLW management facilities.

RICHLAND OPERATIONS OFFICE SITE SUMMARY

RL, or the Hanford Site, is located near Richland, Washington. Its waste management facilities were originally dedicated to supporting the production of plutonium for national defense by managing the wastes generated by reactor and chemical processing operations. In later years, programs at the site became more diversified, and waste management supported R&D for advanced reactors, renewable energy technologies, waste disposal technologies, and contamination cleanup. Site activities are now directed at maintaining a waste management capability for current and future missions and implementing treatment and final disposal of wastes generated. Landlord programs fund some activities that support the overall waste management mission.

ACTIVITIES	STATUS
• The Hanford Site manages all classes of radioactive waste (i.e., HLW, LLW, TRU waste), hazardous waste, mixed waste, and sanitary waste. • Liquid radioactive waste is treated and stored in underground DSTs. • Waste removed from the DSTs will be pretreated as necessary before being sent to HWVP or the GTF. • The high-level/TRU waste from the DSTs will be vitrified in the HWVP, and the LLW from DSTs will be disposed of as grout using the GTF. • Solid LLW is disposed of at the Hanford Site. • Pumpable liquids in the older SSTs are being transferred to DSTs. • The best available technology is being applied to the selection and installation of treatment facilities for liquid effluents being discharged in the soil column. • A waste minimization program is being implemented onsite.	• About 5 million gal of liquid remains to be pumped from SSTs. • The program for the grouting of liquid LLW is under way. • The HWVP construction will begin in FY 1991. • Solid TRU waste and mixed waste are being stored onsite. • Hazardous waste is being shipped offsite for disposal. • Liquid radioactive wastes are being stored in DSTs, and the volume will be reduced by evaporation. • The million-gal phosphate-sulfate waste grout demonstration was completed in July 1989. • The remaining grout disposal vault construction started 2Q FY 1990. • Waste minimization activities include completion of a waste minimization report and implementation of a surplus chemical exchange program. A waste minimization and pollution prevention awareness plan and waste reduction report are being developed.

REGULATORY DRIVERS

- Hanford FFA and Consent Order (May 1989)
- DOE Order 5820.2A
- RCRA
- Washington Administrative Code 173-303
- CAA
- CWA

REGULATORY AUTHORITIES

- State of Washington Department of Ecology and Department of Social and Health Services
- Benton, Franklin, and Walla Walla Counties Air Pollution Control Authority
- Benton-Franklin District Health Department
- EPA Region X
- Army Corps of Engineers
- DOE

MAJOR MILESTONES

- Complete process condensate interim storage basin and restart evaporator (1Q FY 1990)
- Complete Site Waste Minimization Program Plan (3Q FY 1990)
- Start HWVP construction (4Q FY 1991)
- Complete three grout campaigns of DST waste (4Q FY 1991)
- Initiate operations of Waste Sampling and Characterization Facility (2Q FY 1992)
- Complete construction of second grout vault (4Q FY 1992)
- Complete 14 grout campaigns of DST waste (FY 1996)
- Complete interim stabilization and isolation of all SSTs (FY 1996)

FUNDING

(Thousands of Dollars)

	EM
FY90	324,709
FY91B	499,667
FY92	1,047,740
FY93	1,085,559
FY94	1,155,479
FY95	1,063,099
FY96	895,655
FY92-96 TOT	5,247,532

REFERENCES

- DOE/EIS-0113-F, Environmental Impact Statement for the Disposal of Hanford High-Level, Transuranic, and Tank Wastes, 1987
- Plan and Schedule to Discontinue Disposal of Contaminated Liquids into the Soil Column at the Hanford Site, 1987
- DOE/RL-88-33, Hanford Site Waste Management Plan, 1988
- WHC-EP-0212, Hanford Waste Management Technology Plan for Calendar Year 1988, 1989
- WHC-EP-0196-2, Annual Status Report of the Plan and Schedule to Discontinue Disposal of Contaminated Liquids into the Soil Column at the Hanford Site, 1989
- Environmental Restoration and Waste Management Site Specific Plan, Richland Operations Office December 1989

SPECIAL CONSIDERATIONS

- The Hanford FFA and Consent Order establishes specific actions and timetables for key waste management activities.
- DOE policy requires, at the earliest date practicable, discontinuation of the use of soil columns to treat and retain suspended or dissolved contaminants in liquid effluents. Phase I of the Plan and Schedule to Discontinue Disposal of Contaminated Liquids into the Soil Column at the Hanford Site will be completed by FY 1995.

ROCKY FLATS OFFICE SITE SUMMARY

The goal of waste management activities at the RFP is to perform waste packaging, storage, treatment, and transport functions in the most efficient manner possible while maintaining strict regulatory compliance and protecting human health and the environment. Major objectives shown in the Five-Year Plan include the shipment of all "pondcrete" and "saltcrete" wastes to NTS for disposal, replacement of the underground waste transfer lines, upgrading the liquid waste treatment systems, upgrading the Sewage Treatment Plant, and conducting an ongoing waste minimization program.

ACTIVITIES	STATUS
• "Pondcrete" and "saltcrete" wastes will be sampled, treated if necessary, and shipped to NTS for disposal. • The underground waste transfer lines will be replaced by aboveground lines. • A program will be implemented to upgrade various portions of the liquid waste treatment system, including Building 371, portions of Buildings 374, and other piping, pumps, and instrumentation. • A waste minimization program has been implemented to reduce waste generation, propose ways to achieve a volume reduction, and segregate hazardous waste from radioactive waste. • The Sewage Treatment Plant will be upgraded to comply with new conditions of the NPDES Permit. The plant will be further upgraded and other technical initiatives implemented to eliminate offsite water discharge. • Routine waste operations include treating liquid waste in Building 774 and 374, treating solid wastes, treating sanitary waste in the Sewage Treatment Plant, recycling nonradioactive solvents and oils through offsite vendors, and temporarily storing radioactive and mixed wastes pending shipment to an authorized T/S/D facility. • RFP is in the process of satisfying conditions of several agreements that have been signed with the State of Colorado and EPA, Region VIII.	• A FFCA was signed on September 19, 1989. • An AIP was signed that detailed accelerated cleanup activities and new initiatives. • A mixed LLW treatment study was completed in December 1989. • "Pondcrete" is currently being shipped to NTS for disposal. • "Saltcrete" has not yet been approved for disposal awaiting laboratory analyses and NTS acceptance. • NEPA documentation for the replacement of the underground process waste transfer lines will begin in FY 1990. • The upgrades to the Sewage Treatment Plant needed to comply with the NPDES permit will be completed in FY 1992. • RFP has prepared a waste storage report, an inventory report, a treatability report, a waste minimization report, a treatment plan, and an LDR Determination Report. • A Residue Compliance Agreement was signed that addresses developing a system for regulating radioactive mixed residues under the Colorado Hazardous Waste Regulations. An inventory report, a draft compliance framework, and a residue classification plan have been completed, and a residue characterization report is scheduled to be completed in September 1990. • Installation of an LLW baler in Building 776 was completed. • Completion of construction of new liquid waste evaporator in Building 374 was deleted (funded in base program). • Completion of construction of a new hazardous waste storage facility was deleted (funded in base program).

REGULATORY DRIVERS	REGULATORY AUTHORITIES
• AIP • FFCA • RCA • Colorado Hazardous Waste Regulations • RCRA • CERCLA • SARA • TSCA • HSWA • NEPA • NESHAPS • NPDES • CAA • CWA	• Colorado Department of Health • EPA Region VIII • Colorado Water Commission

MAJOR MILESTONES

- Begin operating the supercompactor (1Q FY 1990)
- Complete application packages for mixed waste shipments to NTS (1Q FY 1990)
- Complete "saltcrete" laboratory analyses (3Q FY 1990)
- Complete draft waste and residue characterization studies (4Q FY 1990)
- Issue Waste Minimization Plan (FY 1990)
- Complete engineering of enhanced scrubbing equipment in Building 774 (delayed to 1Q FY 1991)
- Install enhanced scrubbing equipment in Building 774 (delayed to 1Q FY 1991)
- Ship as much "pondcrete" and "saltcrete" to NTS as possible by May 8, 1990; complete shipment of all remaining stored "pondcrete" and "saltcrete" (4Q FY 1991)
- Complete upgrades to the Sewage Treatment Plant to comply with NPDES permit (1Q FY 1992)
- Begin construction on the new landfill (2Q FY 1992)
- Complete engineering of new LLW/mixed waste storage facility (delayed to 3Q FY 1992)
- Complete construction of replacement waste transfer lines (FY 1994)
- Complete construction of the upgrades to the liquid waste treatment system in Building 374 (FY 1995)

FUNDING

(Thousands of Dollars)

	EM
FY90	76,267
FY91B	47,292
FY92	118,293
FY93	156,524
FY94	147,964
FY95	142,365
FY96	129,042
FY92-96 TOT	694,188

REFERENCES

Environmental Restoration and Waste Management, Site-Specific Plan, Rocky Flats Operations Office, December 1989

SPECIAL CONSIDERATIONS

- RFP is not a disposal site. All radioactive wastes must be disposed of at another DOE facility. The disposal of mixed LLW is a primary concern.
- A potential waste management problem is the storage of "saltcrete," a mixed LLW. Much of this waste is stored out-of-doors. Nitrates are suspected to have leached from this waste. This waste is scheduled for disposal at NTS after repackaging.
- RFP is located upgradient from the raw water supply reservoirs of Westminster and Broomfield, Colorado. It is of utmost importance to monitor and control all releases from the plant site.
- RFP is performing activities to comply with several agreements with the State and EPA. Failure to perform these activities will result in a violation of these agreements.

SAN FRANCISCO OPERATIONS OFFICE
LAWRENCE LIVERMORE NATIONAL LABORATORY, LAWRENCE BERKELEY LABORATORY, STANFORD LINEAR ACCELERATOR CENTER, AND ENERGY TECHNOLOGY ENGINEERING CENTER SITE SUMMARIES

SAN manages waste operations at four sites: LLNL in Livermore, California; LBL in Berkeley, California; SLAC at Stanford, California; and ETEC in Santa Susana, California. All of SAN's major facilities generate hazardous, mixed, radioactive, and/or solid waste. LEHR is inactive and, therefore, has no ongoing operations that produce waste; however, some low-level radioactive waste will be produced as a result of the cleanup activities. ETEC generates hazardous solid and LLW but has not been involved in DOE-defined high-level waste activities. LLNL is SAN's largest generator of waste products.

ACTIVITIES	STATUS
• LBL is installing an acid neutralization system for Building 70/70A (LBL). • Activated scrap metal and resin are being disposed of (SLAC). • A HWHF is being designed (LBL). • A DWTF is being designed to replace outmoded, decentralized facilities (LLNL). • A Waste Minimization Project is being implemented as mandated by RCRA requirements (LLNL).	• Installation of the acid neutralization system for Building 70/70A has slipped from September 1989 to 1Q FY1991 (LBL). • Nineteen of 40 resin drums have been sent to a subcontractor for segregation and repackaging (SLAC). • The Environmental Assessment Document for the LBL HWHF is undergoing final review at DOE Headquarters (LBL). • The preliminary design of the DWTF is complete. A draft EIS is complete, and an initial RCRA Permit applications has been submitted. LLNL requested deferral of the incinerator from DWTF. The Draft EIS and RCRA, Part B Permit, will be revised to reflect indefinite deferral of the incinerator (LLNL). • Inventory control has been initiated to begin implementation of waste minimization (LLNL).

REGULATORY DRIVERS

- RCRA
- CERCLA
- DOE Orders 5480.1B and 5820.1A
- SARA Title III, Section 313
- East Bay Municipal Utility District Ordinance 270
- California Administrative Code Title 22 and 23

REGULATORY AUTHORITIES

- California Department of Health Services
- California RWQCB
- Local Air Pollution Control Districts
- County and City UST Regulations
- EPA Region IX

MAJOR MILESTONES

- Upgrade sitewide UST system, LBL (4Q FY 1990) (This activity has been moved to Corrective Activities and the date has changed to 1Q FY 1991.)
- Install acid neutralization system for Building 70/70A, LBL (1Q FY 1991)
- Complete disposal of activated scrap metal and resin, SLAC (2Q FY 1991)
- Complete construction of Site 300 Storage Area, LLNL (FY 1991)
- Complete construction of HWHF, LBL (4Q FY 1992)
- Complete final EIS documentation for DWTF (FY 1992)
- Complete construction of Waste Minimization Facility LLNL (FY 1993)
- Complete construction of DWTF, LLNL (FY 1996)

FUNDING

(Thousands of Dollars)

	EM
FY90	18,925
FY91B	15,716
FY92	53,774
FY93	88,929
FY94	78,753
FY95	58,130
FY96	48,024
FY92-96 TOT	327,610

REFERENCES

- Final EIS 1987 (LLNL)
- DOE Environmental Survey 1988 (LLNL)
- Draft EIS DWTF, 1989 (LLNL)
- DHS Permit (ETEC)
- NRC License (ETEC)
- EIS 1987 (LBL)
- Environmental Restoration and Waste Management Site-Specific Plan, San Francisco Operations Office, December 1989

SPECIAL CONSIDERATIONS

A DOE Tiger Team inspected LLNL Operations in April 1990.

SAVANNAH RIVER OPERATIONS OFFICE SITE SUMMARY

SRS, near Aiken, South Carolina, serves the U.S. national security interest by safely producing nuclear materials while protecting public health and the environment. In fulfilling DOE's Waste Management Program objectives at SRS, an integrated approach was developed to address the T/S/D of all site-generated wastes. This effort has been driven principally by numerous new waste management initiatives. Near-term program emphasis will be placed on the construction and operation of new facilities for the vitrification of HLW; the incineration of low-level, hazardous, and mixed wastes; and treatment of stored TRU wastes in preparation for shipment to WIPP. SRS will upgrade LLW disposal practices and sanitary waste disposal practices. A major effort at SRS during the planning period will be to upgrade all operations in accordance with the SRS Performance Improvement Plan.

ACTIVITIES	STATUS
• HLW is evaporated to reduce its volume and mobility. SRS has a goal to recover 3.5 million gal of space in the tank farms through evaporation in FY 1991. • HLW will be processed in the DWPF for eventual disposal as vitrified glass in an underground permanent repository. ITP, a tank farm process for preparing waste for feed to DWPF, is tentatively scheduled to start up in late 1990. DWPF Saltstone facility will start up in 1990 and will initiate processing of waste concentrate from the Effluent Treatment Facility. • SRS's goal for FY 1990 is to precertify 95 percent of the TRU waste packaged as certifiable. Some TRU waste will require treatment in the future TRU Waste Facility before it can be certified. • Low-level solid waste is disposed in onsite burial trenches. SRS has initiated construction of a new disposal facility for low-level solid waste, which will utilize concrete vaults instead of the current earthen trenches. This facility is expected to be operational by late 1991. • A CIF is being developed and permitted for treatment of hazardous, radioactive, and mixed wastes. The CIF is expected to eliminate the current backlog of incinerable hazardous and mixed wastes within its first 3 years of operation.	• DWPF cold runs had been scheduled to start in 1Q FY 1990, but, based on a more detailed schedule developed in July 1989, cold runs are now scheduled to start in 4Q FY 1990. • More than 96 percent of all the HLW has been removed from an earlier generation of single-wall tanks. • Tank farm processes for removing and preparing waste for feed to DWPF are under construction. Construction completion for ITP facilities is currently scheduled for August 1990. Scope additions are being evaluated and may impact facility physical completion. • TRU waste is being precertified for shipment to WIPP and stored onsite in RCRA storage facilities. • Low-level solid wastes are being disposed of onsite in earthen trenches. Construction of the Intermediate LLW disposal vault was initiated in 1Q FY 1990, several months ahead of the original schedule. • Mixed wastes are being stored in two RCRA-permitted facilities. • Nonradioactive RCRA hazardous waste is being shipped offsite for treatment, incineration, or recovery. More than 2500 drums have now been shipped offsite. Mixed waste is stored onsite awaiting startup of the CIF or development of solidification facilities.

REGULATORY DRIVERS	REGULATORY AUTHORITIES
• DOE Orders • RCRA • South Carolina Hazardous Waste Management Regulations • National Air Standards for Hazardous Air Pollutants • NEPA • CWA • Pending FFA	• South Carolina Department of Health and Environmental Control • EPA Region IV

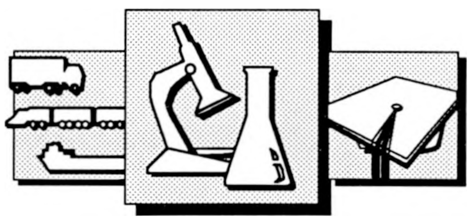
MAJOR MILESTONES	FUNDING
• Complete construction of ITP facilities (DWPF feed preparation facility) (4Q FY 1990) • Complete DWPF cold runs (1Q FY 1993) • Initiate Burial Ground Expansion Facility Operations (1Q FY 1993) • Initiate CIF Operations (3Q FY 1993)	(Thousands of Dollars)

	EM
FY90	374,396
FY91B	476,235
FY92	720,172
FY93	667,404
FY94	766,002
FY95	728,684
FY96	718,070
FY92-96 TOT	3,600,332

REFERENCES	SPECIAL CONSIDERATIONS
• DOE/SR-WM-90-1, <u>Savannah River Waste Management Operations Program Plan</u> • Environmental Restoration and Waste Management, Site-Specific Plan for SRS, December 1989	Treatment processes for mixed (hazardous and radioactive) waste are under development but will require 2 to 5 years to fully implement.

Attachment D

Technology Development Summaries



NOTE: The estimates set forth for FY 1990-1992 are validated amounts. The estimates for FY 1993 and beyond include validated amounts and may include unvalidated amounts. (See Section 1.2 regarding validated and unvalidated cost estimates.)

TECHNOLOGY DEVELOPMENT FUNDING SUMMARY BY CATEGORY
(Thousands of Dollars)

Category	FY90	FY91B	FY92	FY93	FY94	FY95	FY96
Technology Development							
Education and Technology Transfer	19,177	21,207	28,856	36,341	36,958	36,958	37,958
Environmental Restoration	72,966	80,694	109,798	138,274	140,625	140,625	140,625
Technology Support	24,320	26,895	36,596	46,088	46,871	46,871	46,871
Program Support	27,146	30,021	40,849	51,444	52,318	52,318	52,318
Waste Management	42,665	47,183	64,202	80,853	82,228	82,228	82,228
Development Total	186,275	206,000	280,301	353,000	359,000	359,000	359,000
Transportation Management							
Albuquerque	4,210	5,789	7,660	8,780	9,120	8,750	8,050
Oak Ridge	3,516	3,490	5,017	5,372	5,372	5,377	5,377
Richland	2,512	3,705	4,220	5,335	4,585	4,585	4,585
*Transportation Total	10,238	12,984	16,897	19,487	19,077	18,712	18,012
TECHNOLOGY DEVELOPMENT TOTAL	195,238	218,984	295,897	368,487	372,077	372,712	372,012

*Transportation Total for Albuquerque, Oak Ridge and Richland only.

EDUCATION AND TECHNOLOGY TRANSFER PROGRAM

To meet its 30-year compliance and cleanup goal, DOE will encourage and develop additional human resources to solve the problems identified in the ER&WM Five-Year Plan. Because of the magnitude of ER&WM's needs and their similarity to needs present outside the DOE complex, OTD will actively collaborate with other agencies, private industry, and international sources in development efforts and bring the best available technologies to bear on DOE's needs.

NATURE/EXTENT OF PROBLEM

The demand for people with specialized technical and other skills in ER&WM is growing in proportion to the increase in scope, complexity, and stringency of the body of environmental law. Experience has shown that the supply of qualified people in some professional disciplines is already falling short of demand, including environmental, mechanical, and chemical engineering; health physics; and hydrogeology at both the practitioner and professional levels.

DEVELOPMENT STRATEGY

- To ensure greater availability of the human resources needed to support program goals, OTD will emphasize education partnerships, training education, and outreach to minorities and the educationally disadvantaged.
- To meet DOE's needs, new partnerships with educational institutions at all levels will be formed.
- OTD will aggressively pursue cooperative activities that will enhance the availability of technologies for use on DOE's ER&WM problems. Applicable technologies will be sought from the private sector, international sources, and other agencies.

PLANS AND ACCOMPLISHMENTS

Education Initiatives. OTD has initiated an ambitious and innovative education program to address DOE's human resource needs in support of its program goals.

Plans and Activities

- Establish education and research partnerships with universities
- Support development of educational programs to encourage students to pursue careers in ER&WM
- Expand outreach programs (through each DOE field office) for minorities and the educationally disadvantaged
- Prepare EM manpower and employment assessment

Accomplishments

- Established New Mexico Pilot Center University Partnership
- Established South Carolina Partnership
- Initiated planning and funding of ER&WM outreach activities for precollege students
- Established HBCU/MI Fellowship and Scholarship Program
- Initiated nationally competed fellowship and scholarship program
- Initiated Young Faculty Award Program
- Prepared manpower and employment assessment to define needs

PLANS AND ACCOMPLISHMENTS (CONT'D.)

External Liaison. External liaison provides a central interface for OTD with private industry, external agencies, the international community, and public interest groups. The primary objective of this activity is to expedite the identification, assessment, and transfer of available and developing technologies from other sources to DOE's ER&WM problems.

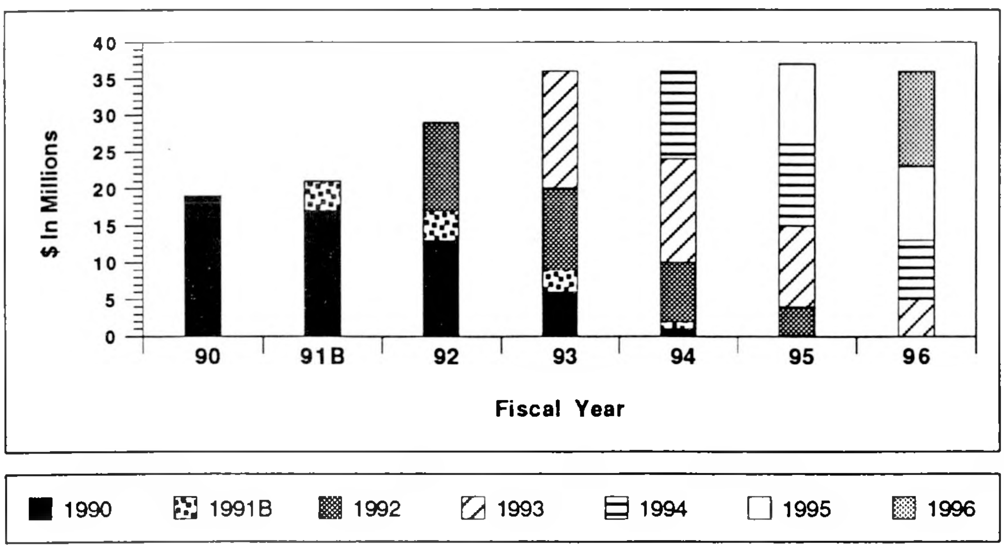
Ongoing and Planned Activities

- Establish a technology transfer program
- Initiate cooperative efforts with other Federal agencies and private industry
- Conduct external reviews of OTD program activities
- Obtain data on international ER&WM activities and technologies; match data to DOE site needs

Accomplishments

- An international technology exchange program was established.
- Funding of EPA SITE projects continued.
- Staff participated in the Interagency Work Group for Hazardous Waste Technologies.
- OTD is providing permanent representation to the Technology Transfer Policy Group.
- An Industrial Integration Working Group was formed to define and provide resolution to existing barriers to industrial integration.
- A consistent policy and a procedure are being developed to evaluate and dispose of unsolicited proposals from the private sector.

BUDGET SUMMARY



Planned funding for FY 1990-1996 for activities initiated in FY 1990-1996.

ENVIRONMENTAL RESTORATION TECHNOLOGY DEVELOPMENT

ER technologies must be identified, adapted, or developed for remediating sites that can pose a danger to human health and the environment. ER consists of two fundamental activities: (1) RAs, involving potential releases from inactive waste sites, and (2) D&D, involving surplus facilities.

NATURE/EXTENT OF PROBLEM

- Past operations connected with DOE nuclear programs resulted in contamination of a large number of sites and facilities with radioactive, hazardous, and mixed wastes.
- Principal concerns connected with RAs pertain to groundwater and soil contamination.
- Waste types addressed by ER include pre-1970 buried TRU waste, LLW, hazardous waste, and mixed waste. Approximately 3,700 contaminated sites have been identified.
- Current remedial technology, primarily soil excavation, and groundwater extraction, will not allow DOE to meet regulatory schedules and, in some cases, may magnify the problems.
- There are approximately 500 contaminated facilities included under D&D. The principal concerns pertain to the collection, retention, and ultimate disposal of contaminating substances and debris.

DEVELOPMENT STRATEGY

- OTD will emphasize adaptation and development of in situ remediation methods that provide more complete and permanent solutions without costly extraction methods.
- Methods that temporarily contain contaminants, pending application of more permanent remedies, will also be sought.
- OTD will also develop more efficient and effective means of removing and treating wastes that are not amenable to in situ treatment.
- Selected remediation methods will meet all relevant CERCLA, RCRA, NEPA, ALA, and OSHA requirements, DOE Orders, and applicable State and local requirements.
- Methods will be sought to support D&D activities for the unique surplus facilities present within the DOE complex. These methods will reduce waste volumes, reduce costs, improve safety, etc.

PLANS AND ACCOMPLISHMENTS

Interim Containment Methods. This activity develops containment methods that reduce the mobility of contaminants pending the development and application of more permanent remedies. Interim, or temporary, containment methods can be crucial to the remediation of sites where there is a high potential for the migration of contaminants between the period from initial site discovery to the implementation of a permanent remedy. Prompt, temporary actions will minimize near-term risk.

Plans and Activities

- Conduct small-scale demonstration of cryogenic containment to determine applicability to DOE waste sites
- Examine other innovative containment methods: hydraulic isolation, innovative caps, walls, other subsurface barriers, etc.

Accomplishments

- Initiated cryogenic barrier program
- Initiated examination of vitrified barriers concept
- Developed and tested hybrid grouting technique for subsurface isolation and stabilization of contaminant plumes

In Situ Remediation. Traditional methods of soil and groundwater cleanup are expensive, time consuming, and generally require exhumation. This action transfers a contaminated material from one place to another. In situ methods need to be developed that either degrade, concentrate, or stabilize the contaminants in surface and subsurface soils and in contaminated groundwater.

Plans and Activities

- Demonstrate contaminant extraction methods such as soil gas extraction and soil flushing
- Develop and demonstrate chemical or electrochemical treatment methods (e.g., chemical oxidation)
- Demonstrate thermal treatment methods such as ISV, radio frequency heating, and in situ heating
- Develop and demonstrate biological method for PCBs, explosives, organics, and selected inorganics such as nitrates
- Apply directional drilling technologies to in situ remediation

Accomplishments

- Established protocol for integrated demonstration, including working committees
- Prepared contaminated crib for ISV
- Identified groundwater test site and began characterization for in situ biological treatment
- Began and completed Phase I of integrated demonstration at WSRS (directional drilling with air injection)
- Completed planning for in situ bioremediation (Phase II)
- Began parallel activity with the Air Force on radio frequency heating

PLANS AND ACCOMPLISHMENTS (CONT'D.)

Other Remediation. Not all waste sites will be amenable to in situ treatment. In these situations, removal of soil or extraction of groundwater will be required. To effectively use these methods, more efficient and safer techniques must be found to retrieve and process waste materials.

Plans and Activities

- Develop and demonstrate soil remediation methods, including retrieval methods (pneumatic pickup, closed loop sluicing), separation methods (soil washing, supercritical water oxidation), and treatment and destruction methods (bioremediation, infrared processes, vitrification, plasma processing)
- Develop and demonstrate groundwater remediation methods (physical, thermal, biological, and chemical)

Accomplishments

- Completed one full-year demonstration of ultraviolet ozone/hydrogen peroxide groundwater treatment system
- Developed chemical kinetics computer model to simulate supercritical water oxidation
- Demonstrated supported liquid membrane technology for removal of uranium, nitrates, chromium, and technetium from groundwater
- Completed pilot-scale tests of bioreactor for treating groundwater containing nitrate and carbon tetrachloride
- Completed bench-scale demonstration of supercritical water oxidation of simulated waste streams
- Began integrated working group for demonstration of supercritical water oxidation involving LANL, SNLL, WHC, and RFP
- Began systemwide working group on bioremediation

D&D Technologies. All contaminated DOE facilities will ultimately require D&D, which will result in large volumes of wastes. OTD's development program will provide processes that will reduce resultant volumes of waste requiring disposal, produce wastes that comply with RCRA, enhance recycling of waste, reduce costs, improve worker safety, and reduce worker radiation exposure.

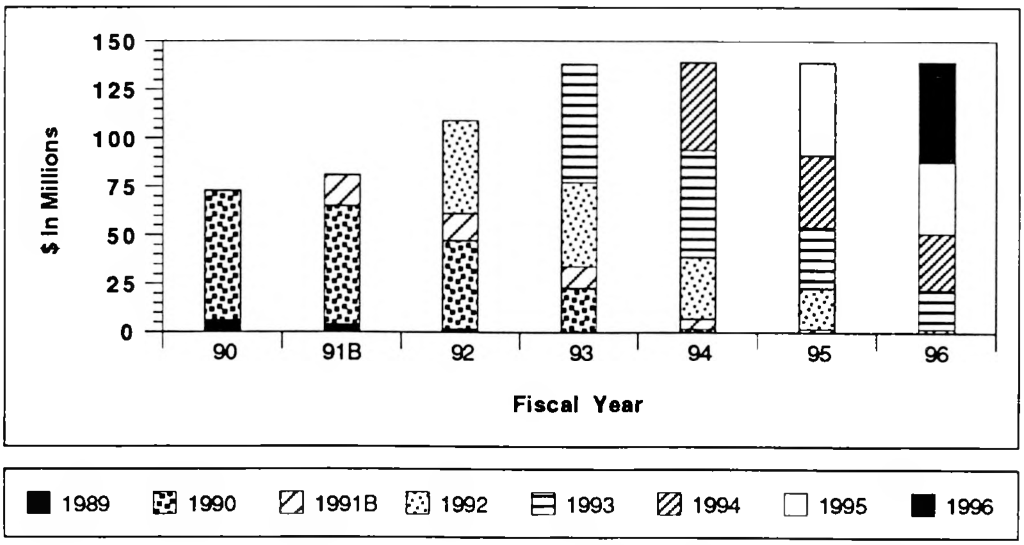
Plans and Activities

- Development of technology improvements specifically for the D&D of gaseous diffusion plants
- Development of technology improvements for production reactor D&D
- Development of technologies for the recycle of metals
- Development of improved thermal and nonthermal cutting techniques for metals, concrete, etc.
- Development of methods to recycle water and decontamination solutions used in D&D processes
- Development of methods to segregate waste into hazardous and radioactive components

Accomplishments

- Began systemwide working group on D&D to coordinate activities

BUDGET SUMMARY



Planned funding for FY 1990-1996 for activities initiated in FY 1989-1996.

SUPPORTING TECHNOLOGIES DEVELOPMENT

This set of activities provides overall coordination for several crosscutting technology development activities. These activities provide technologies or methods that can support needs from within both ER&WM.

NATURE/EXTENT OF PROBLEM

Several technology development needs are common to various aspects of both ER&WM. These needs include, but are not limited to, robotic devices, characterization and analytical techniques, information management, and performance assessment.

In addition, novel solutions to ER&WM needs that can substantially reduce cost or accelerate compliance actions need to be encouraged. Highly innovative approaches may offer significant benefits.

DEVELOPMENT STRATEGY

OTD's strategy for developing crosscutting technologies is to centralize the management of these important technologies. The intent is to eliminate potential duplication of effort that may otherwise result from development activities targeted for two or more ER or WM activities.

OTD will encourage exploration of innovative methods. Feasibility assessments of these ideas will be conducted to identify innovative methods that hold promise.

PLANS AND ACCOMPLISHMENTS

Robotics. Development and application of robotic systems will help to reduce or eliminate worker exposure to hazardous environments and will also improve the efficiency and lower the cost of ER&WM operations. Principal applications include site characterization, monitoring, waste retrieval, waste processing, and D&D.

PLANS AND ACTIVITIES	ACCOMPLISHMENTS
· Development of national robotics program plan to identify and focus high priority R&D efforts	· Formed a National Robotics Team with representation from the national laboratories

Characterization of Waste Sites and Disposal Systems. Characterization methods support ER activities, both RAs and D&D, and WM operations, particularly waste disposal. Improved characterization technologies will provide better information (on the nature of waste sources and the extent of contamination) for predicting contaminant transport.

· Develop more efficient characterization and sampling strategies	· Completed design/fabrication of a drill cutting containment system

PLANS AND ACCOMPLISHMENTS (CONT'D.)

Analytical Methods and Support. This activity develops improved chemical analytical sensors and techniques and maintenance of analytical support laboratories to meet the increasing analytical demands of ER&WM. Analysis of waste and environmental samples represents a significant portion of the total site characterization and remediation costs. Methods are needed to lower these costs. In addition, evolving regulations for analytical needs are not easily applied to many of the unique waste types that are prevalent at DOE facilities.

PLANS AND ACTIVITIES	ACCOMPLISHMENTS
• Develop real-time analytical sensors and instruments	• Reviewed DOE, ER, and WM analytical needs

Information Systems and Data Bases. More integrated, centralized data base and information management systems will be developed to link existing site systems and implement a coordinated RDDT&E Program. ER&WM activities require development of information systems and data bases that support the need for consistent, qualified, and timely data for WM, ER, and program management applications.

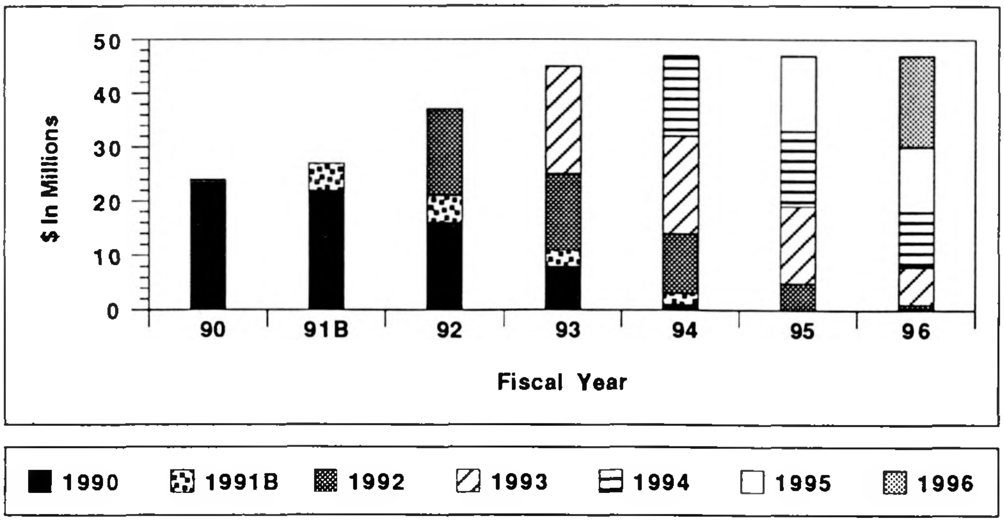
• Strategic planning to assess ER&WM information management needs	• Defined data requirements, developed data entry system, and collected release site data for ER activities

Risk Management. This set of activities will provide the technical basis for selecting priorities for sites and selecting and implementing technologies for application to ER&WM activities. The program will provide standardized methodologies for predicting the long-term performance of a remediation technology and for assessing costs, regulatory compliance, and public acceptability issues important to the successful application of technology. Activities in FY 1990 will emphasize (1) development of standardized performance and risk assessment models and (2) development and application of improved methods for evaluating and selecting technologies to be developed within OTD.

• Development of standardized performance and risk assessment models	• Developed and tested models to predict recharge and three-dimensional subsurface flow and transport

Innovative Technologies. The Innovative Technology Development Program will fund innovative methods, systems, and processes for which proof-of-principle studies can be accomplished in 1 year. At the completion of each project, a technical evaluation will be conducted to determine whether the project should be transferred to the next phase of the applied R&D process. OTD will initiate studies of innovative technologies for both ER&WM in FY 1990.

BUDGET SUMMARY



Planned funding for FY 1990-1996 for activities initiated in FY 1990-1996.

TECHNOLOGY DEVELOPMENT PROGRAM SUPPORT

This activity provides general administrative, financial, management, and internal program support to OTD.

NATURE/EXTENT OF PROBLEM	DEVELOPMENT STRATEGY
• OTD is a new program that has acquired numerous existing technology development activities and is initiating a complementary set of activities. • Technology development activities must be needs-driven and responsive to ER&WM operational needs.	OTD is in the process of building its management and administrative staff to effectively carry out its mission. • Strong, centralized management will be maintained, and the development program will be implemented through DOE Operations Offices. • Program Support Offices located at each DOE field office will assist OTD in the technical integration and coordination of Innovative Technology, R&D, and DT&E projects. • OTD will use technical committees and working groups for advice on technical and programmatic issues.

PLANS AND ACCOMPLISHMENTS

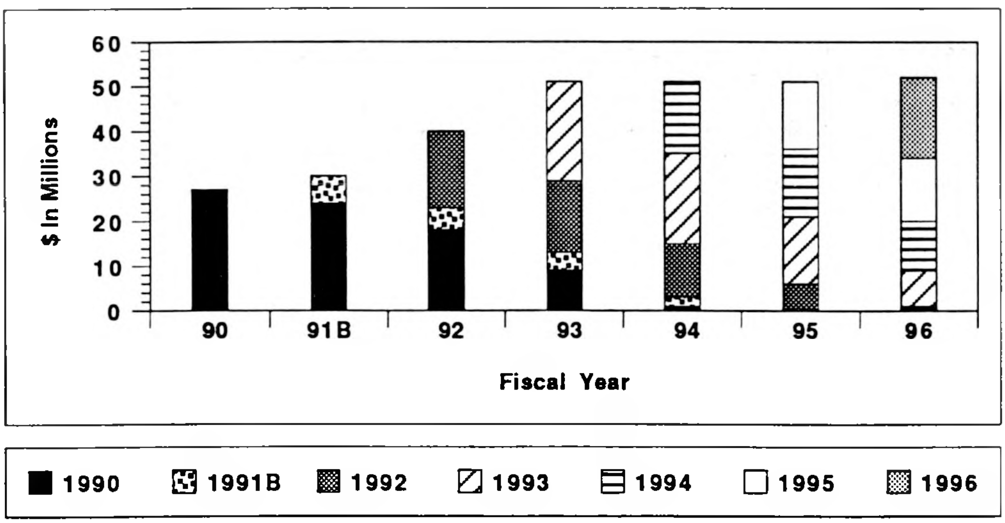
Program Support. Program Support provides general administrative, financial, management, and internal program support to OTD. This activity includes both Headquarters and Field Office Operations.

Plans and Activities
- Conduct annual budget process; review and evaluate ADS submittals from DOE field offices
- Prepare and update Program Plans (e.g., RDDT&E Plan)
- Prepare input to the ER&WM Five-Year Plan
- Coordinate program reviews, meetings, and conferences
- Develop quality assurance programs and related functions
- Maintain OTD project data bases and information management systems

Accomplishments
- Completed Draft Applied RDDT&E Plan (November 1989)
- Established support contracts with field offices to support OTD
- Established program support offices to coordinate Innovative Technology, R&D, and DT&E projects
- Established International Technology Exchange Program

PLANS AND ACCOMPLISHMENTS (CONT'D.)

BUDGET SUMMARY



Planned funding for FY 1990-1996 for activities initiated in FY 1990-1996.

WASTE MANAGEMENT TECHNOLOGY DEVELOPMENT

WMO, the processes by which DOE wastes are treated, stored, and disposed of, require new technology to ensure human safety, minimize environmental impact, and reduce costs. Waste minimization, the reduction at the source of radioactive, hazardous, and mixed waste, can be fully realized only with major technological improvements.

NATURE/EXTENT OF PROBLEM

Without new T/S/D technologies to reduce volumes and destroy or immobilize contaminants to meet environmental regulations, DOE will spend huge amounts of money but still risk facility shutdowns.

- Technologies are needed to support the isolation of defense HLW from the biosphere.
- There is a need for better TRU waste treatment to meet WIPP certification requirements.
- New DOE requirements and proposed EPA regulations make current LLW disposal practices inadequate.
- Without new treatment technologies, DOE will not be able to comply with RCRA regulations for mixed waste T/S/D.
- Waste minimization is required by RCRA, as amended, and by DOE Orders 5820.2A and 5400.1. Further incentives for waste minimization occur from limited disposal site availability, rising disposal costs, and the potential for future liability.

DEVELOPMENT STRATEGY

RDDT&E for WMO will focus on technology to produce acceptable waste materials compatible with disposal requirements and to produce a minimum of secondary waste also requiring treatment and disposal. Technology will be developed to

- prepare high-level liquid waste for processing,
- produce a solidified glassy-ceramic material from already calcined waste,
- treat waste arising from ER activities, and
- ensure permanent disposal in a manner that avoids costly repetitive retrieval and management.

For waste minimization, OTD will focus on technology for (1) complex materials substitutions, (2) process modifications, and (3) recycle processes.

PLANS AND ACCOMPLISHMENTS

Waste Minimization. Waste minimization is mandated by RCRA and DOE Orders. The goal of waste minimization is to reduce or eliminate the problem at the point of generation. It will reduce the amount of waste requiring T/S/D and will lower costs and reduce potential outyear liabilities. Emphasis will be placed on material substitution, process alternation, and material recycling.

Plans and Activities

- Identify and prioritize waste minimization opportunities following process waste assessments for all DOE production plants
- Improve depleted uranium processing techniques to minimize generation of uranium-bearing waste
- Modify plutonium processing operations to (1) improve yields for usable plutonium, (2) reduce quantities of scrap, (3) reduce waste and processing of by-products, and (4) reduce hazardous and mixed waste
- Identify replacements for solvents and VOCs
- Identify process changes to enhance reuse of materials

Accomplishments

- Developed flow sheet for application of TRUEX process to Plutonium Finishing Plant Waste

PLANS AND ACCOMPLISHMENTS (CONT'D.)

Waste Treatment. This set of activities develops technologies to treat radioactive, hazardous, and mixed waste streams in compliance with applicable regulations. RDDT&E for waste treatment operations will focus on technology to produce acceptable waste materials compatible with disposal requirements and a minimum of secondary waste also requiring treatment and disposal.

Plans and Activities

- Develop LLW treatment methods to improve waste forms (i.e., more durable, higher density, uniformly sized)
- Develop improved technologies to separate mixed waste into its radioactive and hazardous components
- Develop technologies to treat mixed wastes in compliance with EPA's LDRs and DOE Orders
- Develop technologies to treat TRU waste that is currently unacceptable for disposal
- Conduct RDDT&E to support selection of a reference strategy for treatment of HLW at Idaho

Accomplishments

- Established partnership among SNL, LANL, Hanford, and Rocky Flats to develop supercritical water oxidation of hazardous wastes; designed and constructed experimental units
- Established national laboratory/university/industry alliance to develop plasma technology
- Completed bench-scale test of waste acid detoxification and recovery system
- Demonstrated Catalyzed Electrochemical Plutonium Oxide Dissolution technique for ash and scrap waste
- Completed conceptual design for DST retrieval system

Waste Storage and Disposal. RDDT&E for waste storage and disposal will emphasize technology to ensure containment and subsequent monitoring of the permanently emplaced waste. Operations of DOE production facilities will be curtailed or stopped unless improved LLW disposal systems are developed and implemented to meet DOE Orders and EPA regulations.

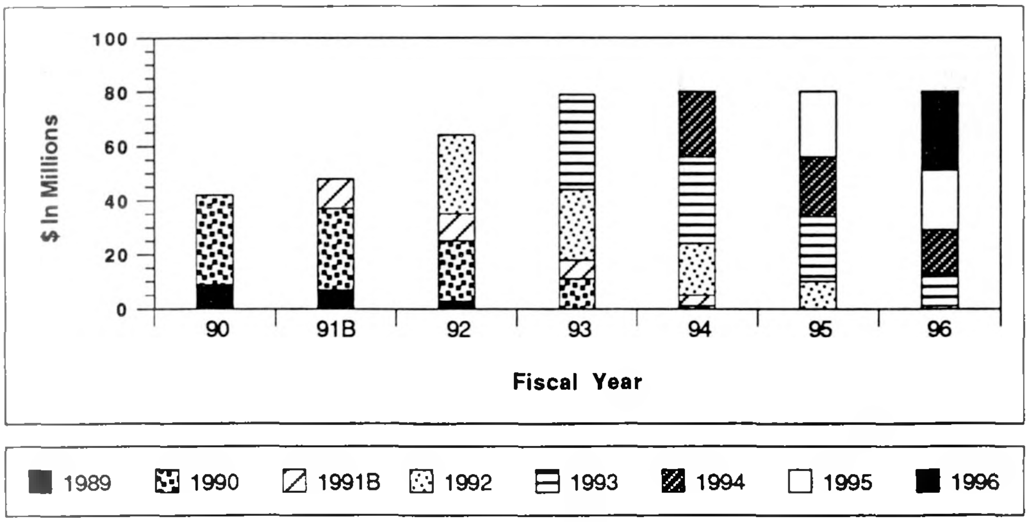
Plans and Activities

- Develop an alternative technology for the disposal of TRU waste not certifiable by WIPP
- Develop improved LLW disposal systems to meet DOE Orders and EPA regulations

Accomplishments

- Demonstrated injection of cementitious slurry into a simulated LLW site (joint effort with USGS)

BUDGET SUMMARY



Planned funding for FY 1990-1996 for activities initiated in FY 1989-1996.

ALBUQUERQUE OPERATIONS OFFICE-ALBUQUERQUE ACTIVITIES SUMMARY FOR TRANSPORTATION DEVELOPMENT

AL directly manages a transportation technology development program for the development of nuclear and hazardous materials packaging and transportation systems. This R&D program consists of seven activity areas for developing technology to solve current and future transportation and packaging problems for DOE and for providing technical support on institutional and regulatory issues.

ACTIVITIES

- Develop improved engineering analysis methods to better predict the behavior of packaging under accident conditions
- Perform transportation package testing for certification and develop and maintain testing and laboratory facilities to accommodate future designs
- Develop advanced technology for new systems, components, and materials for use by packaging designers
- Develop and maintain state-of-the-art analysis skills and capabilities to support transportation package development and certification
- Provide technical data to aid in the resolution of regulatory transportation issues and support U.S. and international standards development and technology transfer
- Provide safety and systems assessment, including radiological risk, logistic, and economic considerations as they affect and are affected by operational and institutional forces
- Develop hazardous and mixed waste materials packaging technology

STATUS

- This is a continuing activity, with milestones in each year, for an ongoing program that will provide technology development support for the development of transportation packagings for DOE.
- As stated in DOE Order 1540.3, it is DOE policy to ensure that the development of radioactive material packagings shall be accomplished in a manner commensurate with (1) operational and program requirements, (2) compliance with all applicable safety regulations, and (3) efficient and effective planning, acquisition, and use.
- Technology exchange meetings with French (CEA) and Japanese (PNL) representatives have been completed. Future meetings are planned that include other countries.
- The program for investigating the problem of hydrogen gas generation in CH TRU waste transported in the TRUPACT II has been completed.
- Various impact limiter designs and materials have been evaluated in structural and thermal tests. More testing is planned in the future for other designs and materials.

REGULATORY AUTHORITIES & DRIVERS

- Title 10 CFR 71, Title 10 CFR 871, NUREG-0360, Title 49 CFR 171-178, Title 40 CFR 260-265
- DOE Orders: 1540.1, 1540.2, 1540.3, 5610.1, 5480.2, 5480.3
- IAEA Safety Series No. 6 and related series publication
- EPA

SPECIAL CONSIDERATIONS

- This transportation technology program operates under the auspices of DOE Order 1540.3 and is described by EM ADSs 100 and 1001 through 1007.
- U.S. transportation regulations are influenced by and are consistent with International Atomic Energy Agency Model Regulations.

MAJOR MILESTONES

- Establish scope of generic EA (3Q FY 1990)
- Submit Ductile Fracture Capability Report (4Q FY 1990)
- Complete Instrumentation Trailer (4Q FY 1990)
- Drop test Mosaik Cask (4Q FY 1990)
- Complete Elastomeric Seal Test Data Compilation (3Q FY 1991)
- Prepare Hazardous and Mixed-Waste Needs and Feasibility Report (4Q FY 1991)
- Make Comprehensive Routing Model available on TRANSNET (2Q FY 1992)
- Plan and support PATRAM Meeting (1992, 1995, and continuing at 3-year intervals)
- Submit Elastic-Plastic Design Report (3Q FY 1992)
- Complete Impact Limiter Studies (4Q FY 1992)
- Complete RADTRAN 5.0 Development (FY 1993)
- Submit Rail Transport Data Report (FY 1993)
- Provide Domestic Support for N14 and Working Groups (Continuing)

REFERENCES

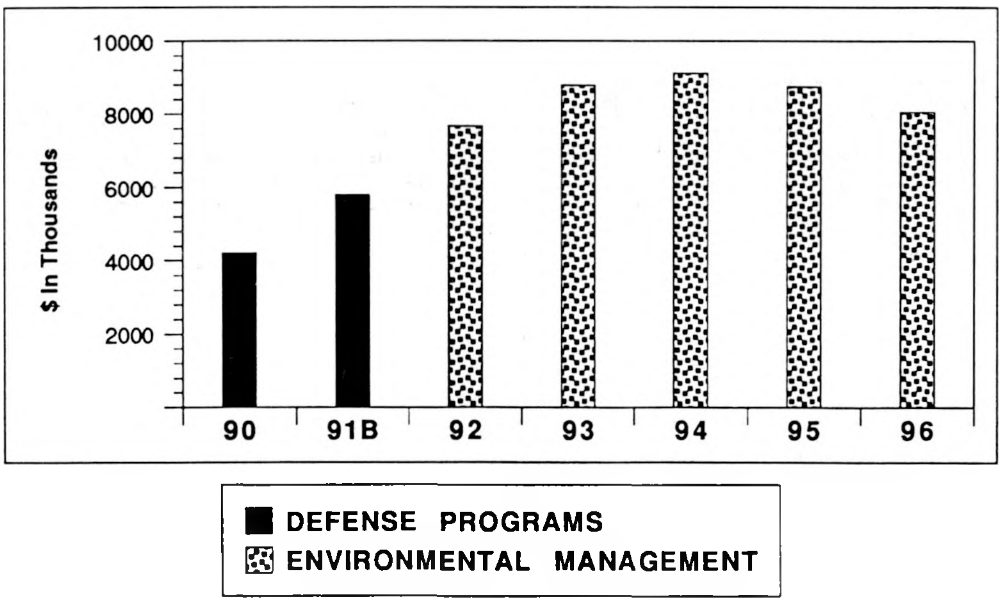
- FY 1990 Transportation Base Technology Program Plan (October 1989)
- Transportation Management Division Management Summary
- DOE Order 1540.3
- RADTRAN 4.0 User Guide, SAND89-2370, TTC-0943

FUNDING BY PROGRAM

(Thousands of Dollars)

	DP	EM	TOTAL
FY90	4,210	0	4,210
FY91	5,789	0	5,789
FY92	0	7,660	7,660
FY93	0	8,780	8,780
FY94	0	9,120	9,120
FY95	0	8,750	8,750
FY96	0	8,050	8,050
FY92-96 TOT	0	42,060	42,060

FUNDING



OAK RIDGE OPERATIONS OFFICE-OAK RIDGE ACTIVITIES SUMMARY FOR TRANSPORTATION MANAGEMENT

OR supports the Transportation Operations and Packaging Programs, the Institutional Programs, and the Information and Communications Programs conducted by DOE's Transportation Management Division.

ACTIVITIES

- Manage regulatory compliance training programs and emergency response workshops
- Develop information and communications products, including films, videos, booklets and brochures, exhibits, etc.
- Manage operation and maintenance of TMD Operational Data Bases (e.g., SM/AC)
- Develop and maintain DOE's shipment tracking system called TRANSCOM
- Develop ANSI standards
- Coordinate major technical conferences and workshops (e.g., PATRAM)

STATUS

- OR has many support programs and activities with milestones developed each year. Many tasks have intermediary milestones that extend over several years. Detailed descriptions of each of these programs are available in the FY 1990 Transportation Management Division Program Plan and corresponding monthly progress reports.
- As stated in DOE Order 1540.1, it is DOE's policy to ensure that traffic and transportation management is accomplished in a manner commensurate with
(1) operational requirements for transportation services;
(2) established practices and procedures for transportation safety, economy, efficiency, and cargo security;
(3) national transportation policy as established in 49 U.S.C and implemented by Federal agencies; and
(4) applicable Federal, State, local, and international transportation regulations.

REGULATORY AUTHORITIES & DRIVERS

- Title 10 CFR Part 71, Title 29 CFR Part 1910, Title 40 CFR Parts 260-265, 761
- DOE Orders 1540.1, 1540.2, 1540.3, 1540.4, 5480.3, 5480.4, 5480.11, 5632.1, 5632.2A
- IAEA Safety Series No. 6 and related series publications

SPECIAL CONSIDERATIONS

Each of these programs is influenced by extensive domestic and international regulations and is designed to ensure safety and economic efficiencies.

MAJOR MILESTONES

- Complete Emergency Preparedness Document revision (3Q FY 1990)
- Training - Complete 67 training programs and workshops (FY 1990-1991)
- Manage, operate, and enhance the SM/AC system and perform transportation analysis (FY 1990-1991)
- Complete TRANSCOM-track WIPP demonstration shipments (to be determined)
- Update Information Resource Manual (4Q FY 1990)
- Complete series of Information and Communication fact sheets for distribution (FY 1990-1991)
- Conduct eight transportation exhibits and four TRANSCOM exhibits (FY 1990)

REFERENCES

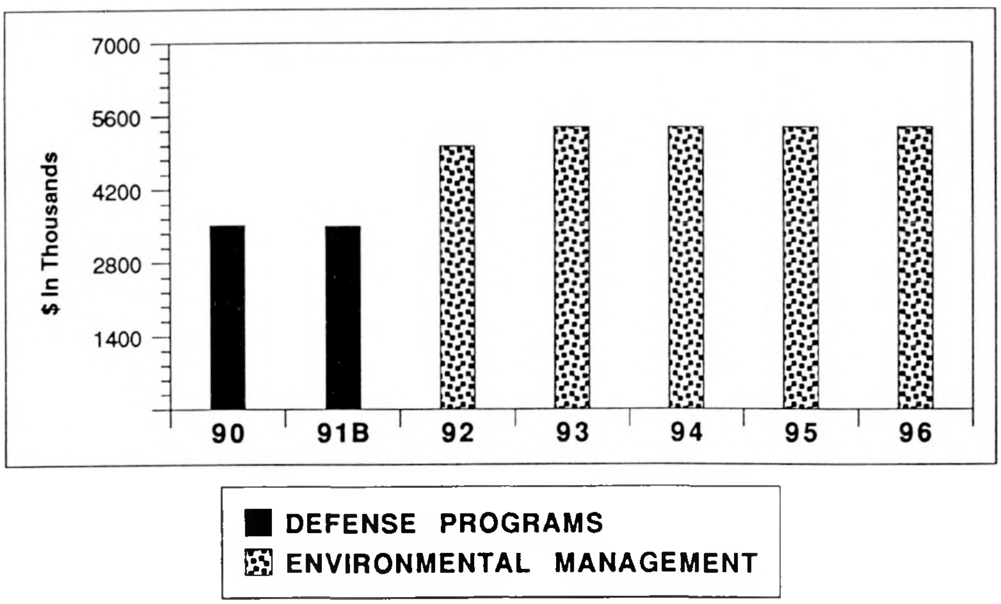
- FY 1990 Transportation Management Division Program Plan
- Transportation Management Division Management Summary
- DOE Orders and Directives in 1540 Series of DOE Orders
- OR Monthly Reports-Transportation Management Division Program Support

FUNDING BY PROGRAM

(Thousands of Dollars)

	DP	EM	TOTAL
FY90	3,516	0	3,516
FY91	3,490	0	3,490
FY92	0	5,017	5,017
FY93	0	5,372	5,372
FY94	0	5,372	5,372
FY95	0	5,377	5,377
FY96	0	5,377	5,377
FY92-96 TOT	0	26,515	26,515

FUNDING



RICHLAND OPERATIONS OFFICE-RICHLAND ACTIVITIES SUMMARY FOR TRANSPORTATION MANAGEMENT

RL supports Transportation Operations and Packaging Programs and outreach activities conducted by DOE's Transportation Management Division.

ACTIVITIES

- Analyze and develop transportation policies and procedures
- Develop operations technology, including the automated Transportation Management System
- Perform economic analysis of transportation activities
- Conduct specific transportation training programs
- Evaluate packaging operations and transporter interface
- Perform regulatory and standards analysis maintenance
- Provide technical expertise for DOE's oversight control system (audits/appraisal support) for explosive classification activities, packaging operations, and transportation logistics management
- Manage cooperative agreement concerning urban transportation activities
- Perform institutional program development and outreach activities

STATUS

- RL has many support programs and activities with milestones developed each year. Many tasks have intermediary milestones that extend over several years. Detailed descriptions of these programs are available in the FY 1990 Transportation Management Division Program Plan.
- As stated in DOE Order 1540.1, it is DOE's policy to ensure that traffic and transportation management is accomplished in a manner commensurate with (1) operational requirements, including training for transportation services; (2) established practices and procedures for transportation safety, economy, efficiency, and cargo security; (3) National transportation policy as established in 49 U.S.C. and implemented by Federal agencies; and (4) applicable Federal, State, local, and international transportation regulations.

REGULATORY AUTHORITIES & DRIVERS

- Title 10 CFR 71; Title 29 CFR Part 1910; Title 40 CFR Parts 260-265, 761; Title 49 CFR Parts 171-179
- DOE Orders 1540.1, 1540.2, 1540.3, 1540.4, 5480.3, 5480.4, 5480.11, 5632.1, 5632.2A
- IAEA Safety Series No. 6 and related series publications

SPECIAL CONSIDERATIONS

- The transportation management programs conducted by RL are described in detail in the FY 1990 Transportation Management Division Program Plan and in the EM ADSs.
- Each of these programs is influenced by extensive domestic and international regulations and is designed to ensure safety and economic efficiencies.

MAJOR MILESTONES

- Implement the Motor Carrier Evaluation Program (2Q FY 1990)
- Implement ATMS - pilot project (3Q FY 1990)
- Conduct nine training workshops (4Q FY 1990)
- Complete FY 1990 Freight Rate negotiations (4Q FY 1990)
- Prepare DOT 7A packaging guides (4Q FY 1990)

REFERENCES

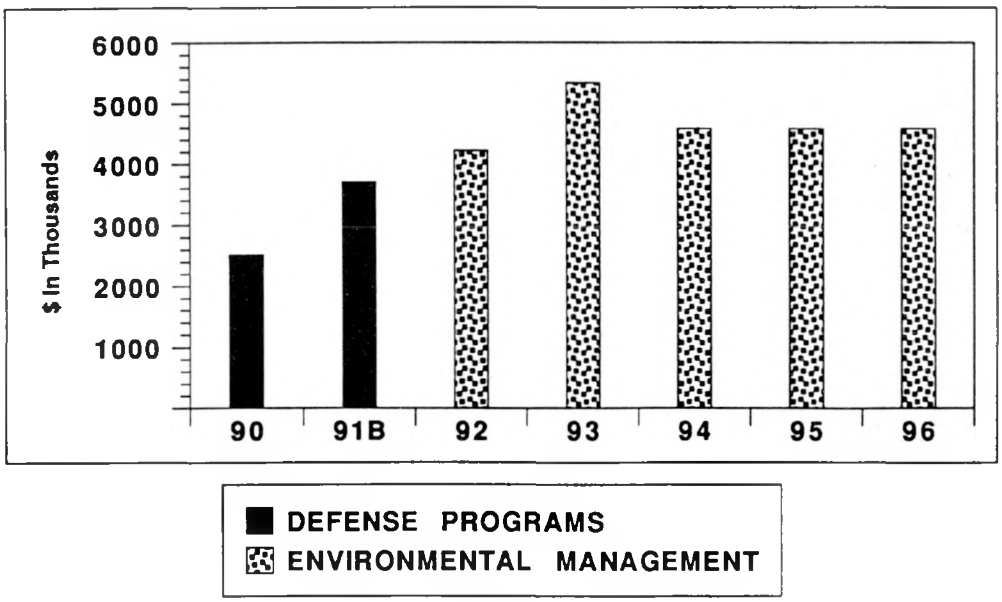
- FY 1990 Transportation Management Division Program Plan
- Transportation Management Division Management Summary
- DOE Orders and Directives in 1540 Series of DOE Orders
- RL Monthly Reports-Transportation Management Division Program Support

FUNDING BY PROGRAM

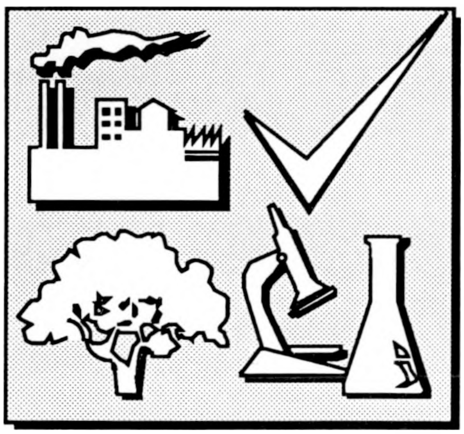
(Thousands of Dollars)

	DP	EM	TOTAL
FY90	2,512	0	2,512
FY91	3,705	0	3,705
FY92	0	4,220	4,220
FY93	0	5,335	5,335
FY94	0	4,585	4,585
FY95	0	4,585	4,585
FY96	0	4,585	4,585
FY92-96 TOT	0	23,310	23,310

FUNDING



Appendices



AVAILABILITY OF FY 1992-1996 FIVE-YEAR PLAN AND ACTIVITY DATA SHEETS

The FY 1992-1996 Environmental Restoration and Waste Management Five-Year Plan and the Activity Data Sheets are available at the following Department of Energy Public Reading Rooms:

U.S. Department of Energy
Headquarters
Room 1E-190
1000 Independence Avenue, S.W.
Washington, DC 20585

Albuquerque Operations Office
U.S. Department of Energy
National Atomic Energy Museum
Building 20358
Kirtland Air Force Base
Wyoming Boulevard
Albuquerque, NM 87115

U. S. Department of Energy
Amarillo Area Office
P. O. Box 30030
Amarillo, TX 79120

Chicago Operations Office
U.S. Department of Energy
9800 South Cass Avenue
Argonne, IL 60439

Idaho National Engineering Laboratory
Pocatello Office
215 North 9th
Pocatello, ID 83201

Idaho National Engineering Laboratory
Twin Falls Office
1061 Blue Lakes Boulevard, North
Suite 106
Twin Falls, ID 83001

Idaho Operations Office
U.S. Department of Energy
1776 Science Center Drive
Idaho Falls, ID 83402

Nevada Operations Office
U.S. Department of Energy
2753 South Highland Avenue
Las Vegas, NV 89192-8518

Oak Ridge Operations Office
U.S. Department of Energy
200 Administration Road
Oak Ridge, TN 37831-8510

Richland Operations Office
U.S. Department of Energy
825 Jadwin Avenue
Richland, WA 99352

Rocky Flats Public Reading Room
Front Range Community College
3645 West 112th Avenue
Westminister, CO 80030

San Francisco Operations Office
U.S. Department of Energy
1333 Broadway
Oakland, CA 94612

Savannah River Operations Office
U.S. Department of Energy
Gregg-Granite Library
University of South Carolina-Aiken
171 University Parkway
Aiken, SC 29801

ACTIVITY DATA SHEETS
SORTED BY OPERATIONS OFFICE, INSTALLATION, AND CATEGORY
(dollars in thousands)

APPENDIX A

ADS No.	Activity Title	FY91B	FY92R
=AL, AL/LEAD PROGRAM OFFICE - TRT , CAT: TR			
100-	ENGINEERING ANALYSIS	1,130	1,150
1001-	TRANSPORTATION PACKAGE TESTI	800	800
1002-	ADV.TECHNOLOGY DEV. FOR TRAN	1,090	1,150
1003-	TRANSPORTATION PACKAGING CER	150	170
1004-	REGULATORY SUPPORT,STANDARDS	250	350
1005-	SAFETY AND SYSTEMS ASSESSMEN	2,069	2,210
1006-	TRANSPORTATION BASE TECHNOLO	300	330
1007-	HAZARDOUS AND MIXED HAZARDOU	0	1,500
Subtotal AL , AL/LEAD PROGRAM CF, TR		5,789	7,660
Subtotal AL , AL/LEAD PROGRAM OF		5,789	7,660
=AL, ALBUQUERQUE OPERATIONS , CAT: CA			
1-	SOUTHERN FACILITIES SEWER TR	0	0
Subtotal AL , ALBUQUERQUE OPERAT, CA		0	0
=AL, ALBUQUERQUE OPERATIONS , CAT: ER			
17-	ER PROGRAM SUPPORT	1,830	4,620
1001-	SOUTH VALLEY SUPERFUND SITE	3,000	2,064
Subtotal AL , ALBUQUERQUE OPERAT, ER		4,830	6,684
=AL, ALBUQUERQUE OPERATIONS , CAT: WM			
2-	BASE WASTE MGT - PROGRAM MAN	63	4,140
3-	MANAGEMENT RESERVE	0	8,200
4-	MANAGEMENT RESERVE	0	6,700
5-	MANAGEMENT RESERVE	0	3,500
6-	MANAGEMENT RESERVE	0	4,100
7-	AL - PROGRAM DIRECTION	0	9,785
11-	DOE/STATE OF NEW MEXICO AGRE	0	3,000
12-	DOE/STATE OF TEXAS AGREEMENT	0	3,000
13-	DOE/STATE OF MISSOURI AGREEM	0	2,000
14-	DOE/STATE OF OHIO AGREEMENT	0	2,000
15-	DOE/STATE OF FLORDIA AGREEME	0	1,000
16-	DOE/STATE OF CALIFORNIA AGRE	0	1,000
Subtotal AL , ALBUQUERQUE OPERAT, WM		63	48,425
Subtotal AL , ALBUQUERQUE OPERAT		4,893	55,109
=AL, IT RESEARCH INSTITUTE , CAT: CA			
13-	CONSTRUCTION OF SEWER LINE T	50	103
14-	REPLACE UNDERGROUND FUEL OIL	30	0
Subtotal AL , IT RESEARCH INSTIT, CA		80	103
=AL, IT RESEARCH INSTITUTE , CAT: ER			
1013-	DIESEL OIL RELEASE ASSESSMEN	0	754
1014-	DIESEL OIL RELEASE REMEDIATI	0	722
1015-	HOT POND ASSESSMENT (AL-IT-4	0	378
1016-	HOT POND REMEDIATION (AL-IT-	0	0
1017-	HOT POND REMOVAL REMEDIATION	65	0

ADS No.	Activity Title	FY91B	FY92R
1018-	NITRATES GROUNDWATER ASSESSM	0	1,206
1019-	NITRATES IN GROUND WATER REM	0	2,498
1021-	SANITARY LAGOONS ASSESSMENT	0	722
1022-	SANITARY SEWAGE LAGOONS REME	0	0
Subtotal AL , IT RESEARCH INSTIT, ER		65	6,280
=AL, IT RESEARCH INSTITUTE , CAT: WM			
3046-	ACTINIDE - LSC WASTE DISPOSA	250	0
3047-	BASE PROGRAM	250	327
3048-	SANITARY WASTE	0	20
3050-	STATE AGREEMENT - NEW MEXICO	0	78
3261-	REPLACEMENT OF PCB ELECTRICA	35	0
3265-	ADD'N/UPGRADE TO WASTE STORA	0	312
3269-	ASBESTOS REMOVAL AND DISPOSA	0	156
Subtotal AL , IT RESEARCH INSTIT, WM		535	893
Subtotal AL , IT RESEARCH INSTIT		680	7,276
=AL, KANSAS CITY PLANT , CAT: CA			
17-	NPDES SEWER SYSTEMS	1,093	316
23-	FLOOD PROTECTION IMPROVEMENT	4,956	3,824
25-	PROTECTION OF WASTE MANAGEME	0	0
28-	REPAIR & SEAL STORAGE LOTS	0	0
33-	UPGRADE PRECIOUS METAL PROC	0	0
104-	SURFACE COATING OPERATIONS E	0	0
Subtotal AL , KANSAS CITY PLANT , CA		6,049	4,140
=AL, KANSAS CITY PLANT , CAT: ER			
1020-	ENVIRONMENTAL RESTORATION MA	820	1,000
1022-	ENVIRONMENTAL RESTORATION MA	500	500
1024-	ABANDONED INDIAN CREEK OUTFA	500	15,000
1025-	CLASSIFIED WASTE TRENCH AREA	0	0
1026-	CLASSIFIED WASTE TRENCH ASSE	100	200
1027-	DEPT. 26 ASSESSMENT (AL-KC-4	300	450
1028-	DEPT. 26 REMEDIATION (AL-KC-	0	0
1029-	DEPT. 27 ASSESSMENT (AL-KC-4	115	115
1030-	DEPT. 27 REMEDIATION (AL-KC-	0	200
1031-	MISCEL. CONT. SITES SOILS AS	610	641
1032-	MISCELLANEOUS CONTAMINATED S	0	0
1033-	MISCELLANEOUS PCB SITES ASSE	215	50
1034-	MISCELLANEOUS PCB SITES REME	0	300
1035-	NE AREA G.W. REMEDIATION	29	153
1036-	NEPA ENVIRONMENTAL ASSESSMEN	506	500
1037-	OUTFALL 001 RACEWAY & R. PON	150	225
1038-	OUTFALL 001 RACEWAY & RETEN	0	0
1040-	PLATING BUILDING ASSESSMENT	230	50
1041-A	PLATING BUILDING PHASE II RE	0	0
1041-B	PLATING BUILDING PHASE 3 (AL	0	200
1042-	RCRA SO. LAGOON CLOSURE G.W.	0	230
1043-	RCRA SOUTH LAGOON G.W. ASSES	230	30
1044-	RCRA TANK FARM CLOSURE G. W.	29	466
1045-	TCE STILL AREA G.W. REMEDIAT	0	0
1046-	TCE STILL AREA SOILS ASSESSM	230	345

ACTIVITY DATA SHEETS
SORTED BY OPERATIONS OFFICE, INSTALLATION, AND CATEGORY
(dollars in thousands)

ADS No.	Activity Title	FY91B	FY92R
1047-	TCE STILL AREA SOILS REMEDIA	0	0
Subtotal AL , KANSAS CITY PLANT , ER		4,564	20,655
=AL, KANSAS CITY PLANT , CAT: WM			
21-	ELIMINATE TTO'S FROM INDUSTR	0	0
3048-	BASE PROGRAM FOR HAZARDOUS W	3,073	3,696
3049-	BASE PROGRAM FOR HAZ WASTE S	1,401	2,135
3053-	RAD & MIXED WASTE DISPOSAL &	0	18
3054-	RAD & MIXED WASTE OPERATIONS	3	26
3238-	HAZARDOUS WASTE MINIMIZATION	683	986
3239-	SOLVENT RECLAMATION FACILITY	0	0
3249-	SURFACE WATER RUNOFF DETENTI	0	0
3271-	DECONTAMINATE HEAVY MACHININ	0	0
3272-	SEAL SANITARY SEWER & WASTE	0	0
3274-	ROOFING OVER BARREL LOT	0	1,100
3275-	BASE PROGRAM FOR WASTE TREAT	0	4,988
3276-	BASE PROGRAM FOR SANITARY WA	0	281
3277-	BASE PROGRAM FOR SANITARY WA	0	1,075
3278-	INVENTORY AND REPLACE ITEMS	0	0
Subtotal AL , KANSAS CITY PLANT , WM		5,160	14,305
Subtotal AL , KANSAS CITY PLANT		15,773	39,100
=AL, LOS ALAMOS LAB , CAT: CA			
42-	HAZ/MIXED WASTE STORAGE & TR	4,200	6,115
43-	CENTRALIZED HE WASTEWATER FA	0	250
46-	NPDES PROJECTS	284	300
47-	NPDES UPGRADES	200	2,200
49-	REPLACE PCB TRANSFORMERS AND	2,297	3,000
51-	SANITARY WASTE WATER CONSOLI	3,500	2,500
52-	SEPTIC TANK REPAIR	285	600
54-	SPILL PREVENTION CONTROL AND	285	300
55-	UNDERGROUND STORAGE TANKS	427	783
70-	WATER SYPPLY SYSTEM/CROSS CO	0	500
74-	NEW STACK AT LAMPF	0	3,650
3263-	RCRA ACTIVE FIRING SITES	0	466
Subtotal AL , LOS ALAMOS LAB , CA		11,478	20,664
=AL, LOS ALAMOS LAB , CAT: ER			
1049-	CANYONS (AL-LA-1) ASSESSMENT	100	100
1050-	CMR WING 9 DECOMMISSIONING	90	90
1052-	CMR WING 9 DECOMMISSIONING	0	0
1052-A	CMR WING 9 DECOMMISSIONING	0	0
1053-	LAPRE REACTOR DECOMMISSIONIN	0	0
1054-	PHASE SEPARATOR PIT DECOMMIS	0	0
1055-	TA-21 BLDG 3 & 4 SOUTH DECOM	0	1,500
1062-	INTERIM REMDIAL MEASURES - A	500	600
1063-	INTERIM REMEDIAL MEASURES-RE	2,000	2,000
1066-	NEPA DOCUMENTATION ASSESSMEN	200	2,500
1067-	RCRA MIXED WASTE DISPOSAL FA	1,083	4,327
1070-	TA-21 BLDG 3 & 4 SOUTH SURVE	20	0
1071-	TA-0 AREAS, FIR. RANGES ETC.	150	2,000
1072-	TA-0 TOWNSITE AREAS ETC. ASS	250	3,000

ADS No.	Activity Title	FY91B	FY92R
1073-	TA-0, TOWNSITE AREAS ETC. AS	150	2,000
1077-	TA-1 CONTAM AREAS STRUC. TOW	0	0
1078-	TA-1, CONTAM. STRUCTURES TOW	0	6,000
1079-	TA-10 FIRING SITES, STR TOWN	150	2,000
1082-	TA-11,13,16,24,25 OUTFALLS,	200	200
1083-	TA-11,15,24 FIRING SITES ASS	0	500
1084-	TA-12 FIRING SITES STRUC. AS	0	0
1085-	TA-14 FIRING SITES ASSESSMEN	0	0
1086-	TA-15 FIR.SITES BURN AREAS,	0	250
1088-	TA-15 PROCESS AREAS ASSESSME	0	350
1089-	TA-15, FIRING PTS A, B,G,DAH	90	80
1090-	TA-16 AREA P LANDFILL CLOSUR	1,590	810
1091-	TA-16 BURNING GND SURFACE ET	0	0
1092-	TA-16, TA-25 PONDS, PITS, TA	0	500
1093-	TA-18,27 CONTAM BLD ETC. ASS	0	250
1094-	TA-18,27 CONTAM BLD SUBSURF	0	250
1095-	TA-18,27 CONTAM. BLD, ETC. A	0	200
1096-	TA-19 CONTAM STRUC. ASSESSME	20	1,000
1098-	TA-2 PITS, CONTAM AREAS ASSE	0	250
1099-	TA-2,41 CONTAM AREAS & BLD.	0	350
1100-	TA-20,53, PITS, ETC., ASSESS	0	0
1101-	TA-21 BLDGS OUTFALLS & SPILL	0	0
1103-	TA-21 MAT'L DISPOSAL AREAS A	0	0
1105-	TA-21 SUBSURF STRUC. REMEDIA	0	0
1106-	TA-21 SUBSURFACE STRUCTURES	0	8,000
1107-	TA-21, MAT'LS DISP AREAS A,B	0	10,400
1109-	TA-21, OUTFALLS, BLDGS & SPI	0	6,000
1111-	TA-22,40 CONTAM AREAS & STRU	0	350
1112-	TA-26 CONTAM AREAS ASSESS (A	0	2,000
1113-	TA-26, CONTAMINATED AREAS RE	0	0
1114-	TA-3,59 CONTAM. STRUC. AREAS	0	500
1115-	TA-3,59 CONTAM. STRUC. AREAS	0	500
1116-	TA-3,59, CONTAM STRUC. & ARE	0	500
1117-	TA-31 CONTAM AREAS ASSESSMEN	0	2,000
1118-	TA-31, CONTAMINATED AREAS RE	0	0
1119-	TA-32 CONTAM AREAS & STRUC E	50	1,000
1121-	TA-33 BLDGS & OUTFALLS REMED	0	0
1122-	TA-33 BLDGS AND OUTFALLS ASS	0	6,000
1123-	TA-33 MAT'L DISPOSAL AREAS R	0	0
1124-	TA-33 SUBSURFACE STRUC. REME	0	0
1125-	TA-33 SUBSURFACE STRUCTURES	0	2,000
1126-	TA-33, MATERIAL DISPOSAL ARE	0	6,000
1127-	TA-35 WASTE OIL STORAGE PIT	0	0
1129-	TA-35,42,48,55-ASSESS. (AL-L	250	3,000
1130-	TA-36 CONTAM AREAS ASSESSMEN	0	350
1131-	TA-36, FIRING SITES, PITS AS	0	350
1132-	TA-39 FIR. SITES MAT'L DISP	0	350
1134-	TA-4,5,35,52-ASSESS. (AL-LA-	400	4,000
1135-	TA-40 SCRAP DETONA. SITE CLO	0	0
1136-	TA-43 OUTFALLS ASSESSMENT (A	0	0
1138-	TA-45 INDUS. LIQ. WASTE TR.	50	1,000
1140-	TA-46, CONTAM STRUC & AREAS	0	350
1141-	TA-46, LAGOONS, OUTFALLS ASS	0	350
1142-	TA-46, LANDFILL CONTAM STRUC	0	350
1144-	TA-49, DEEP SUBSURFACE CONTA	20	2,000
1145-	TA-49, SURFACE STRUCTURES AS	100	2,000
1147-	TA-50, MATERIAL DISPOSAL ARE	400	4,000

(dollars in thousands)

ADS No.	Activity Title	FY91B	FY92R
1148-	TA-51 WASTE DRUMS & DEBRIS A	0	0
1149-	TA-53 OUTFALLS, DISP. PIT AS	0	0
1150-	TA-54 AREA L WASTE OIL ETC.	0	0
1151-	TA-54 AREAS G CLOSURE REMEDI	790	4,540
1152-	TA-54 AREAS L & H CLOSURE RE	1,655	5,343
1153-	TA-54 MAT'L DISP. AREAS L,H,	450	2,500
1154-	TA-57 FENTON HILL SITE ASSES	0	0
1155-	TA-6,22,40 CONTAM AREA ASSES	200	1,550
1156-	TA-6,7,22,40 CONTAM AREA ASS	0	350
1157-	TA-8,9 FIRING SITES, ETC. AS	0	350
1158-	TA-8,9,23 PITS, ETC. ASSESS.	0	350
2105-	INSTALLATION WORK PLAN ASSES	950	1,750
2106-	MANAGEMENT ACTIVITIES (AL-LA	1,500	4,420
2107-	MANAGEMENT ACTIVITIES (AL-LA	2,000	5,000
2110-	ENVIRONMENTAL ANALYTICAL CHE	0	0
Subtotal AL , LOS ALAMOS LAB , ER		15,408	120,610
=AL, LOS ALAMOS LAB , CAT: WM			
41-	SANITARY WASTE WATER SLUDGE	0	600
3056-	ASBESTOS & PCB DISPOSAL	715	1,563
3057-	CONT OF OPERATIONS/LLW RADIO	0	0
3058-	CONT. OF OPERATIONS - BASE P	1,267	1,367
3059-	CONT. OF OPERATIONS	2,156	2,262
3060-	CONTINUITY OF OPERATIONS/LLW	356	404
3061-	CONT. OF OPERATIONS/LLW SYS	107	263
3062-	CONTINUITY OF OPERATIONS/LOW	71	164
3063-	CONTINUITY OF OPERATIONS/MIX	569	569
3064-	CONTINUITY OF OPERATIONS/MIX	191	600
3069-	DISPOSAL: TA-54 AREA G EXPAN	0	0
3071-	DISPOSAL/RADIOLOGICAL PERFOR	213	450
3074-	LOW LEVEL SOLID DISPOSAL	1,117	1,847
3075-	LOW LEVEL WASTE COMPACTOR SY	500	250
3079-	MIXED LLW STORAGE/TRU WASTE	633	1,527
3080-	NEW RADIOACTIVE LIQUID WASTE	0	500
3081-	RCRA LANDFILL OPERATIONS	0	0
3084-	STORAGE/CHEMICAL WASTE MANAG	1,459	2,412
3086-	STORAGE/WASTE OIL & STORAGE	750	50
3088-	TREATMENT - BASE PROGRAM	4,721	3,878
3089-	TREATMENT: SLUDGE SOLIDIFICA	0	0
3091-	TREATMENT: EMERGENCY POWER S	0	500
3095-	TREATMENT/COMPACTING REDUCIN	0	107
3097-	TREATMENT/RADIOACT LIQ WASTE	0	200
3098-	TREATMENT/TA-55 TO TA-50 LIQ	0	0
3099-	TREATMENT/THERMAL DESTRUCTIO	1,054	1,467
3100-	TREATMENT/TRU WASTE TREATMEN	465	310
3104-	WASTE MANAGEMENT TREATMENT	2,988	3,900
3105-	TECHNICAL OVERSIGHT FOR WAST	363	786
3256-	MIXED WASTE RECEIVING & STOR	0	6,640
3262-	SANITARY LANDFILL	0	0
3267-	BIOMONITORING FOR NPDES PERM	300	300
3268-	SEPTIC TANK TRUCK	315	0
3269-	GEOTHERMAL SITE CLOSING	384	300
4106-	RADIOACTIVE WASTE EXAMINATIO	0	1,200
4107-	ORALLOY RESIDUE TREATMENT AN	0	1,783
4111-	TREATMENT - THERMAL DESTRUCT	1,089	2,282
4112-	CONTINUITY OF OPERATIONS - D	1,770	1,858
4113-	RADIOACTIVE LIQUID WASTE	1,357	1,600
4114-	TREATMENT - RADIOACTIVE LIQU	1,670	2,000
4116-	STATE AGREEMENT	0	900
4117-	RH TRU WASTE CLOSEOUT	0	250
4118-	REMOVE ABANDONED TA-55 TO TA	0	500
4119-	TA-54 INDIAN RUIN REMEDIATIO	0	460
4120-	BELOW REG LIMITS - ALT STUDY	0	450
4121-	WASTE MANAGEMENT NEPA DOCUME	0	4,600
4122-	SARS FOR NEW WASTE MANAGEMEN	0	1,890
4123-	FILTER TEST FACILITY SUPPORT	0	277
4124-	WASTE MINIMIZATION - IMPLEME	756	1,045
4125-	WASTE MINIMIZATION - PLANNIN	185	185
4126-	WASTE MANAGEMENT DIRECT SUPP	0	5,466
Subtotal AL , LOS ALAMOS LAB , WM		27,521	59,962
Subtotal AL , LOS ALAMOS LAB		54,407	201,236
=AL, MOUND PLANT , CAT: CA			
58-	ES&H PHASE II	1,723	0
4003-	METEOROLOGICAL STATION UPGRA	0	0
Subtotal AL , MOUND PLANT , CA		1,723	0
=AL, MOUND PLANT , CAT: ER			
1160-	AREA B/GROUNDWATER REM (AL-M	0	73
1161-	AREA B/GROUNDWATER ASSESSMEN	543	437
1162-	BLDG 21 SURVEILLANCE & MAINT	42	44
1163-	D&D SITES ASSESS (AL-MD-6)	20	0
1164-	D&D SITES--HAZ. CONSTITUENTS	0	701
1165-	DECOMMISSIONING OF BUILDING	0	0
1166-	DECOMMISSIONING OF CONTAMINA	0	0
1167-	DECOMMISSIONING OF PLUTONIUM	1,224	0
1168-	DECOMMISSIONING OF RESEARCH	0	0
1169-	DECOMMISSIONING OF THE SANIT	0	374
1170-	DECOMMISSIONING OF SPECIAL M	8,345	7,182
1172-	DECOMMISSIONING OF SEMI-WORK	0	1,140
1173-	DECOMMISSIONING OF SW-22/R-1	0	1,890
1174-	DECOMMISSIONING OF SEMI-WORK	5,110	6,258
1175-	DECOM UNDER GRD LINES TO WAS	0	3,080
1176-	DECOMMISSIONING OF WASTE TRA	332	1,800
1177-	DECOMMISSIONING OF PLUTONIUM	68	120
1178-	SANITARY DISPOSAL (SD) PLANT	26	180
1179-	INACTIVE TANKS (AL-MD-8) REM	0	683
1180-	MAIN HILL SEEPS ASSESS (AL-M	1,416	791
1181-	MAIN HILL SEEPS REMEDIATION	0	0
1182-	MIAMI-ERIE CANAL ASSESS (AL-	2,354	10,312
1183-	MIAMI-ERIE CANAL REMEDIATION	0	5,610
1184-	MISC. SITES ASSESS (AL-MD-3)	920	2,428
1185-	MISCELLANEOUS SITES REMEDIAT	0	0
1187-	"NON-ORPHAN" SURVEY PLANNING	500	0
1188-	RAD CONTAMINATED SOILS ASSES	831	2,100
1189-	RAD CONTAMINATED SOILS REM (	0	0
1190-	RCRA 3004 (U) SITES ASSESS (	477	332
1191-	RCRA 3004 (U) SITES REMEDIAT	0	0
1194-	SURVEILLANCE & MAINTENANCE S	0	60

APPENDIX A

ACTIVITY DATA SHEETS
SORTED BY OPERATIONS OFFICE, INSTALLATION, AND CATEGORY
(dollars in thousands)

ADS No.	Activity Title	FY91B	FY92R
4005-	ASSESSMENT OF UNDER GRD LINE	500	0
4006-	ASSESSMENT OF CONTAMINATED S	0	0
4007-	ASSESSMENT OF FUTURE SURPLUS	0	0
4008-	SITE-WIDE RF/FS (AL-MD-9)	49	73
4009-	MISC ACTIVITIES RELATED TO R	300	581
4010-	ER PROGRAM MANAGEMENT	0	701
4011-	BLDG 21 ASSESSMENT	0	0
4012-	INACTIVE TANKS (AL-MD-8) ASS	0	984
Subtotal AL , MOUND PLANT , ER		23,057	47,934
=AL, MOUND PLANT , CAT: WM			
3106-	WASTE MGMT - CONT OF OPER 58	0	1,196
3107-	BASE PROGRAM: WASTE MGMT DIS	1,134	1,290
3108-	BASE WASTE MANAGEMENT - STOR	34	34
3109-	BASE PROGRAM: HAZARDOUS WAST	777	1,531
3112-	BASE PROGRAM WASTE MGMT: MIX	205	205
3113-	BASE PROGRAM WASTE MANAGEMEN	45	45
3115-	PROGRAM WASTE MANAGEMENT MIX	0	129
3116-	BASE PROGRAM WASTE MGMT CONT	213	220
3117-	BASE PROGRAM WASTE MGMT: RAD	981	1,263
3118-	BASE PROGRAM WASTE MANAGEMEN	25	25
3120-	BASE PROGRAM WASTE MANAGEMEN	1,468	3,025
3122-	WASTE MGMT - CONT OF OPER RC	0	905
3251-	SITE DRAINAGE UPGRADE	0	800
3252-	UPGRADE CLARIFIER	80	620
3253-	STORMWATER TREATMENT PLANT	0	0
3264-	OFFSITE DRAINAGE	0	0
3273-	ACTIVE UNDERGROUND STORAGE T	60	61
3274-	PLANT DRAINAGE DITCH, ETC.	0	207
4013-	BASE PRO: WASTE MGMT TREATME	0	516
4014-	BASE PROGRAM: WASTE MINIMIZ	63	347
Subtotal AL , MOUND PLANT , WM		5,085	12,419
Subtotal AL , MOUND PLANT		29,865	60,353
=AL, PANTEX PLANT , CAT: CA			
67-	ESH ENHANCE-RCRA WASTE STAGI	0	0
68-	ESH ENHANCE-UNDERGROUND TANK	0	0
69-	ESH ENHANCE-WASTE TREATMENT	0	0
70-	HAZARDOUS WASTE STAGING FACI	1,100	0
72-	RCRA COMPLIANT STORAGE UNITS	0	315
73-	CHEMICAL STORAGE PADS	0	0
74-	REPLACEMENT OF UNDERGROUND S	0	0
76-	CONVERSION EVAPOR. PANS TO H	200	0
Subtotal AL , PANTEX PLANT , CA		1,300	315
=AL, PANTEX PLANT , CAT: ER			
1195-	ACTIVE BURNING GROUND ASSESS	0	0
1198-	CHEMICAL RELEASES ASSESSMENT	0	400
1199-	CHEMICAL RELEASES REMEDIATIO	0	0
1200-	CONSTRUCTION LANDFILLS ASSES	1,000	1,000
1201-	CONSTR/DEMOLITION DEBRI LAND	0	0
1202-	DECONTAMINATION DECOMM-SURVE	46	46
1203-	FIRE DEPARTMENT BURN PITS AS	800	600
1204-	FIRE DEPT. BURN PITS REMEDIA	0	0
1205-	FIRING SITES ASSESSMENT (AL-	0	500
1206-	FIRING SITES REMEDIATION (AL	0	0
1207-	FORMER COOLING TOWER ASSESSM	460	390
1208-	FORMER COOLING TOWER REMEDIA	0	0
1211-	HIGH EXPL./RAD. SITES REMEDI	0	0
1212-	HIGH EXPLOSIVE/RAD. SITES AS	0	280
1213-	HYPALON POND ASSESSMENT (AL-	400	220
1214-	HYPALON POND (ZONE 11) REMED	0	500
1215-	NEPA DOCUMENTATION - ASSESSM	200	150
1216-	ONSITE PLAYAS AND DITCHES AS	1,560	1,000
1217-	PLAYAS AND DITCHES REMEDIATI	0	0
1218-	PRIORITY RECONNAISSANCE SITE	0	0
1219-	PRIORITY RECONNAISSANCE ASSE	750	500
1220-	OLD SEWAGE TREATMENT PLANT A	410	200
1221-	OLD SEWAGE TREATMENT PLANT R	0	0
1222-	SUPPLEMENTAL SITES ASSESSMEN	0	300
1223-	UNDERGROUND STORAGE TANKS AS	500	0
1224-	UNDERGND STORAGE TANKS REMED	714	2,220
1225-	RCRA 3008(H)-DOCUMENTATION (	150	150
1226-	RCRA 3008(H)-DOCUMENTATION (	0	0
1227-	LEAKING UNDERGRD STOR TANK A	400	400
1228-	LEAKING UNDERGRD STOR TANKS	0	0
1229-	ER PROGRAM CONTRACT MANAGEME	350	500
1230-	ZONE 12 NORTH GROUNDWATER AS	500	1,000
1231-	ZONE 12 NORTH GROUNDWATER RE	0	0
1232-	BURNING GROUND ASSESSMENT (A	1,188	500
1233-	BURNING GROUND REMEDIATION (	0	0
1234-	SUPPLEMENTAL SITES REMEDIATI	0	0
Subtotal AL , PANTEX PLANT , ER		9,428	10,856
=AL, PANTEX PLANT , CAT: WM			
71-	HAZARDOUS WASTE TREATMENT &	0	8,800
75-	ELIMINATION OF EFFLUENT DISC	0	1,200
3123-	BASE WASTE MGMT - CONTINUITY	456	3,150
3124-	BASE WASTE MGMT - DISPOSAL O	492	3,229
3125-	BASE WASTE MGMT - STORAGE OP	289	641
3126-	BASE WASTE MGMT - TREATMENT	667	6,034
3127-	EPA WATER PURIFICATION EQUIP	0	500
3128-	HIGH EXPLOSIVE INCINERATOR	0	0
3130-	CONTRACTOR SUPPORT - TX AGRE	0	260
3240-	SOLVENT RECOVERY EQUIPMENT	0	0
3241-	HIGH EXPLOSIVE WASTE WATER R	1,100	0
3242-	WASTE CHEMICAL CONTROL COMPU	0	265
3243-	HAZARDOUS WASTE UNIT CLOSURE	0	604
3244-	HAZARDOUS WASTE UNIT CLOSURE	0	575
3247-	BURNING GROUND UPGRADES	0	405
3250-	SECONDARY CONTAINMENT - BLDG	0	150
3251-	ZERO DISCHARGE - PHOTO LABS	0	190
3252-	SECONDARY CONTAINMENT - BLDG	0	265
3253-	WASTEWATER RECYCLE SYSTEM F	0	70
Subtotal AL , PANTEX PLANT , WM		3,004	26,338

(dollars in thousands)

ADS No.	Activity Title	FY91B	FY92R
	Subtotal AL , PANTEX PLANT	13,732	37,509
=AL, PINELLAS PLANT , CAT: CA			
4-	LIQUID WASTE STORAGE FACILIT	0	0
8-	UNDERGROUND STORAGE TANK REM	0	0
Subtotal AL , PINELLAS PLANT , CA		0	0
=AL, PINELLAS PLANT , CAT: ER			
1001-	4 1/2 ACRE SITE ASSESSMENT	270	25
1002-	4 1/2 ACRE SITE REMEDIATION	300	369
1003-	FLORIDIAN AQUIFER ASSESSMENT	610	369
1004-	FLORIDAN AQUIFER REMEDIATION	0	0
1005-	MISC. SITES ASSESSMENT (AL-P	720	246
1006-	MISCELLANEOUS SITES REMEDIAT	242	1,230
1007-	NEPA DOCUMENTATION (EA) - AS	200	369
1008-	NORTHEAST SITE ASSESSMENT (A	0	0
1010-	PEAK OIL PRP CONTRIBUTION AS	350	431
1011-	PEAK OIL PRP CONTRIBUTION RE	0	0
1012-	SLUDGE HOLDING TANK	0	0
Subtotal AL , PINELLAS PLANT , ER		2,692	3,039
=AL, PINELLAS PLANT , CAT: WM			
3038-	BASE WASTE MANAGEMENT - CONT	363	383
3040-	BASE WASTE MANAGEMENT - DISP	509	761
3041-	BASE WASTE MANAGEMEMT - STOR	234	253
3043-	BASE WASTE MANAGEMENT - TREA	101	106
3237-	BASE WASTE MANAGEMENT - WAST	48	51
3300-	BASE WASTE MANAGEMENT - CONT	0	1,955
3310-	STATE AGREEMENT - FLORIDA	0	100
Subtotal AL , PINELLAS PLANT , WM		1,255	3,609
	Subtotal AL , PINELLAS PLANT	3,947	6,648
=AL, SANDIA ALBUQUERQUE , CAT: CA			
91-	HYDROGEOLOGIC WELLS	0	308
94-	SEWER EFFLUENT MONITORING SY	20	0
95-	SEWER LINE	0	1,000
96-	AIR POLLUTION CONTROL AND MO	0	1,000
100-	WATER POLLUTION	0	1,000
Subtotal AL , SANDIA ALBUQUERQUE, CA		20	3,308
=AL, SANDIA ALBUQUERQUE , CAT: ER			
1266-	CENTRAL COYOTE TEST FIELD AS	0	801
1267-	CHEMICAL WASTE LANDFILL ASSE	89	0
1268-	CHEMICAL WASTE LANDFILL CLOS	0	236
1270-	COYOTE CANYON BLAST AREA ASS	173	107
1271-	COYOTE CANYON BLAST AREA REM	0	0
1272-	COYOTE SPRINGS ASSESSMENT (A	35	338
1273-	EDGEWOOD TEST SITE ASSESSMEN	0	0
1281-	KAUAI TEST FACILITY (AL-SA-1	0	0
1282-	LURANCE CANYON ASSESSMENT (A	0	528
1283-	MULTI-PARTY SITE REMEDIATION	0	0

ADS No.	Activity Title	FY91B	FY92R
1284-	MULTI-PARTY SITES - ASSESSME	45	119
1285-	NEPA ASSESSMENT	0	636
1288-	PENDULUM AREA ASSESSMENT (AL	0	376
1289-	MIXED WASTE LANDFILL ASSESSM	402	522
1290-	MIXED WASTE LANDFILL REMEDIA	0	400
1292-	SANDIA ENGINEERING REACTOR D	27	32
1293-	SCHOOLHOUSE MESA ASSESSMENT	0	0
1294-	SEPTIC TANKS & DRAINFIELDS R	0	400
1295-	SEPTIC TANKS AND DRAINFIELDS	737	2,457
1297-	SOUTH COYOTE TEST FIELD ASSE	0	0
1298-	SOUTHWEST COYOTE TEST FIELD	0	176
1300-	STORAGE TANKS ASSESSMENT (AL	8	236
1301-	STORAGE TANKS REMEDIATION (A	0	400
1302-	TECHNICAL AREA 1 ASSESSMENT	0	0
1303-	TECHNICAL AREA 2 ASSESSMENT	686	756
1304-	TECHNICAL AREA 2 REMEDIATION	0	236
1305-	TECHNICAL AREAS 3 & 5 REMEDI	0	236
1306-	TECHNICAL AREAS 3&5 ASSESSME	675	2,638
1308-	THUNDER RANGE ASSESSMENT (SA	631	283
1309-	TIJERAS ARROYO ASSESSMENT (A	0	0
1311-	TONOPAH TEST RANGE AREA 9 AS	0	0
1312-	TONOPAH TEST RANGE, AREA 3 A	450	267
1313-	TONOPAH TEST RANGE, TEST ARE	0	0
1326-	PROGRAM MANAGEMENT	268	543
1327-	REMOTE FACILITIES	126	236
1329-	PROGRAM MANAGEMENT	0	35
Subtotal AL , SANDIA ALBUQUERQUE, ER		4,352	12,994
=AL, SANDIA ALBUQUERQUE , CAT: WM			
3182-	AQUEOUS PROCESSING LINE	0	0
3183-	ASBESTOS WASTE MANAGEMENT	165	335
3186-	FILTER PRESS	0	0
3189-	MACHINING WASTE COOLANT SYST	0	0
3193-A	MWF CONSTRUCTION CONTINUATIO	80	2,200
3193-C	MIXED WASTE FACILITY EQUIPME	145	1,760
3193-E	MIXED WASTE FACILITY STORAGE	0	0
3200-A	HAZARDOUS WASTE MANAGEMENT O	0	3,500
3200-B	PACKAGING AND STORAGE OF HAZ	950	1,200
3200-C	ANALYSIS, TRANSPORTATION & D	1,035	2,660
3200-E	MODIFICATIONS & UPGRADE OF H	0	495
3202-A	CONTINUITY OF RAD/MW MGMT. O	200	1,100
3202-B	PACKAGING AND STORAGE OF RAD	740	3,100
3202-C	CERTIFICATION, TRANSPORTATIO	530	1,500
3204-A	PCB MANAGEMENT	150	480
3204-B	PCB TRANSPORTATION AND DISPO	75	220
3204-C	REPLACE PCB EQUIPMENT	0	0
3204-D	RETROFILL PCB TRANSFORMERS	0	0
3207-	REESTABLISH BACKGROUND WATER	0	0
3208-	REISSUE GROUNDWATER SAMPLING	0	0
3223-A	HAZARDOUS/RAD/MIXED WASTE MI	110	2,100
3223-B	HAZ/RAD/MIXED WASTE MINIMIZA	75	1,525
3257-	TEST, UPGRADE, CLOSE STORAGE	315	1,200
3333-A	SEWER OPERATIONS MANAGEMENT	0	2,680
3333-B	SEWER TREATMENT	0	990
5006-	WASTE MANAGEMENT AT TONOPAH	0	700
5007-	STATE AGREEMENTS	0	550

APPENDIX A

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(dollars in thousands)

ADS No.	Activity Title	FY91B	FY92R
5008-	SANITARY AND MEDICAL WASTE M	0	280
Subtotal AL , SANDIA ALBUQUERQUE, WM		4,570	28,575
Subtotal AL , SANDIA ALBUQUERQUE		8,942	44,877
=AL, SANDIA LIVERMORE , CAT: CA			
103-	TRL TRITIUM MONITOR SYSTEM R	280	440
Subtotal AL , SANDIA LIVERMORE , CA		280	440
=AL, SANDIA LIVERMORE , CAT: ER			
1314-	FUEL OIL SPILL ASSESSMENT (A	0	0
1315-	FUEL OIL SPILL REMEDIATION (	1,126	3,655
1316-	NAVY LANDFILL ASSESSMENT (AL	0	0
1317-	NAVY LANDFILL REMEDIATION (A	0	4,129
1318-	NEPA AT SNLL	0	1,500
1319-	TRUDELL AUTO REPAIR SHOP ASS	0	0
1320-	TRUDELL AUTO REPAIR SHOP REM	130	0
1321-	SNLL MISCELLANEOUS SITES	0	599
Subtotal AL , SANDIA LIVERMORE , ER		1,256	9,883
=AL, SANDIA LIVERMORE , CAT: WM			
99-	GAS PURIFICATION AND WASTE R	0	0
3225-	ANALYSIS AND DISPOSAL OF HAZ	170	190
3226-	ANALYSIS AND DISPOSAL OF RAD	80	100
3227-	ASBESTOS WASTE MANAGEMENT	35	542
3228-	MODIFICATION & UPGRADE OF HA	0	0
3229-	PACKAGING AND STORAGE OF HAZ	345	370
3230-	PACKAGING AND STORAGE OF RAD	100	130
3231-	TRANSPORTATION OF HAZARDOUS	35	35
3232-	TRANSPORTATION OF RADIOACTIV	20	30
3243-	HAZARDOUS AND RADIOACTIVE/MI	10	35
3244-	SEWER OPERATIONS MANAGEMENT	0	83
3245-	SEWER TREATMENT	0	60
3246-	AIP INCREMENTAL COSTS	0	200
3248-	SEWER LINE	0	0
Subtotal AL , SANDIA LIVERMORE , WM		795	1,775
Subtotal AL , SANDIA LIVERMORE		2,331	12,098
=AL, UMTRA PROJECT OFFICE , CAT: ER			
1322-A	UMTRA PROJECT AMBROSIA LAKE	751	729
1322-B	UMTRA PROJECT AMBROSIA LAKE	1,804	6,750
1325-A	UMTRA PROJECT BELFIELD/BOWMA	697	2,112
1325-B	UMTRA PROJECT BELFIELD/BOWMA	424	29
1327-A	UMTRA PROJECT CANONSBURG ASS	20	21
1327-B	UMTRA PROJECT CANONSBURG REM	30	0
1328-A	UMTRA PROJECT DURANGO ASSESS	884	783
1328-B	UMTRA PROJECT DURANGO REMEDI	2,647	0
1330-A	UMTRA PROJECT FALLS CITY ASS	3,338	3,023
1330-B	UMTRA PROJECT FALLS CITY REM	4,490	7,683
1331-A	UGWR PROJECT FALLS CITY ASSE	509	3,529
1331-B*	UGWR PROJECT FALLS CITY REME	0	0
1332-A	UMTRA PROJECT GRAND JUNCTION	4,874	5,819
1332-B	UMTRA PROJECT GRAND JUNCTION	23,241	33,001
1333-A	UGWR PROJECT GRAND JUNCTION	0	145
1334-A	UMTRA PROJECT GREEN RIVER AS	204	21
1334-B	UMTRA PROJECT GREEN RIVER RE	0	0
1337-A	UMTRA PROJECT GUNNISON ASSES	2,239	1,615
1337-B	UMTRA PROJECT GUNNISON REMED	4,673	5,777
1338-A	UGWR PROJECT GUNNISON ASSESS	0	145
1338-B	UGWR PROJECT GUNNISON REMEDI	0	0
1339-A	UMTRA PROJECT LAKEVIEW ASSES	565	21
1339-B	UMTRA PROJECT LAKEVIEW REMED	0	0
1341-A	UMTRA PROJECT LOWMAN ASSESSM	512	1,424
1341-B	UMTRA PROJECT LOWMAN REMEDIA	177	5,435
1344-A	UMTRA PROJECT MAYBELL ASSESS	979	1,024
1344-B	UMTRA PROJECT MAYBELL REMEDI	69	3,374
1346-A	UMTRA PROJECT MEXICAN HAT AS	2,144	1,320
1346-B	UMTRA PROJECT MEXICAN HAT RE	8,843	4,998
1349-A	UMTRA PROJECT MONUMENT VALLE	1,264	559
1349-B	UMTRA PROJECT MONUMENT VALLE	8,611	297
1351-A	UMTRA PROJECT NATURITA ASSES	425	613
1351-B	UMTRA PROJECT NATURITA REMED	105	5,309
1354-A	UMTRA PROJECT RIFLE (2 SITES	2,915	3,666
1354-B	UMTRA PROJECT RIFLE (2 SITES	15,267	16,972
1355-A	UMTRA PROJECT RIVERTON ASSES	144	21
1355-B	UMTRA PROJECT RIVERTON REMED	0	0
1357-A	UMTRA PROJECT SALT LAKE CITY	155	21
1357-B	UMTRA PROJECT SALT LAKE CITY	0	0
1358-A	UGWR PROJECT SALT LAKE CITY	0	0
1358-B	UGWR PROJECT SALT LAKE CITY	0	0
1359-A	UMTRA PROJECT SHIPROCK ASSES	312	454
1359-B	UMTRA PROJECT SHIPROCK REMED	0	0
1361-A	UMTRA PROJECT SLICK ROCK (2	998	750
1361-B	UMTRA PROJECT SLICK ROCK (2	554	3,960
1363-A	UMTRA PROJECT SPOOK ASSESSME	333	21
1363-B	UMTRA PROJECT SPOOK REMEDIAT	0	0
1364-A	UMTRA PROJECT TUBA CITY ASSE	557	21
1364-B	UMTRA PROJECT TUBA CITY REME	0	0
1366-A	UGWR PROJECT SHIPROCK ASSESS	0	0
1366-B	UGWR PROJECT SHIPROCK REMEDI	0	0
1369-A	UGWR PROJECT LAKEVIEW ASSESS	0	0
1369-B	UGWR PROJECT LAKEVIEW REMEDI	0	0
1370-A	UGWR PROJECT TUBA CITY ASSES	491	181
1370-B	UGWR PROJECT TUBA CITY REMED	0	0
1371-A	UGWR PROJECT MONUMENT VALLEY	0	0
1371-B	UGWR PROJECT MONUMENT VALLEY	0	0
Subtotal AL , UMTRA PROJECT OFFI, ER		96,245	121,623
Subtotal AL , UMTRA PROJECT OFFI		96,245	121,623
=AL, WASTE ISOLATION PILOT PLANT , CAT: WM			
3234-	BASE WASTE MANAGEMENT-STORAG	123,808	212,987
Subtotal AL , WASTE ISOLATION PI, WM		123,808	212,987

(dollars in thousands)

ADS No.	Activity Title	FY91B	FY92R
	Subtotal AL , WASTE ISOLATION PI	123,808	212,987
=AL, WASTE ISOLATION PILOT PROJECT , CAT: WM			
3235-	WASTE MGMT - STIPULATED AGRE	0	0
Subtotal AL , WASTE ISOLATION PI, WM		0	0
	Subtotal AL , WASTE ISOLATION PI	0	0
	Subtotal AL	360,412	806,476
=CH, , CAT: CA			
9990-AA	CORRECTIVE ACTIVITIES	0	0
Subtotal CH , , CA		0	0
=CH, , CAT: WM			
9991-AA	WASTE MANAGEMENT	3,713	0
Subtotal CH , , WM		3,713	0
	Subtotal CH ,	3,713	0
=CH, AMES LABORATORY, IOWA STATE UNIV. , CAT: ER			
5053-01	UNDERGROUND STORAGE TANK REM	0	0
Subtotal CH , AMES LABORATORY, I, ER		0	0
=CH, AMES LABORATORY, IOWA STATE UNIV. , CAT: WM			
5002-02	WASTE MANAGEMENT OPERATION	81	205
Subtotal CH , AMES LABORATORY, I, WM		81	205
	Subtotal CH , AMES LABORATORY, I	81	205
=CH, ARGONNE EAST , CAT: CA			
1003-00	800 Area Landfill Leachate C	250	1,400
1004-00	Treatment of Boiler House Ar	0	0
1005-00	Cooling Tower Blowdown Water	0	0
1006-00	Laboratory Wastewater Treatm	3,310	2,837
1008-00	Freund Pond Characterization	0	0
1009-00	Freund Pond Remediation	178	0
1010-00	Sanitary Wastewater Treatmen	400	3,500
1011-00	Laboratory and Sanitary Sewe	1,000	720
1012-00	Chloride Removal Plant	0	0
1017-00	Canal Water Treatment Rehabi	650	375
1018-00	Equalization Pond Rehabilita	0	0
1019-00	Laboratory and Sanitary Sewe	1,200	0
Subtotal CH , ARGONNE EAST , CA		6,988	8,832

ADS No.	Activity Title	FY91B	FY92R
=CH, ARGONNE EAST , CAT: ER			
1022-00	UST Removal	0	0
1023-00	800 Area Landfill Characteri	0	300
1024-00	800 Area Landfill Remediatio	110	110
1025-00	East Area Sewage Treatment P	23	0
1026-00	East Area Sewage Treatment P	0	0
1027-00	570 Holding Pond Characteriz	0	0
1028-00	570 Holding Pond Remediation	130	0
1029-00	Sawmill Creek Characterizati	0	0
1030-00	Sawmill Creek Cleanup	16	0
1031-00	Lime Sludge Removal	150	150
1032-00	317/319/ENE Area Characteriz	731	300
1033-00	317/319/ENE Area Remediation	119	119
1034-00	D&D of the Experimental Boil	2,666	2,528
1035-00	D&D of the CP-5 Reactor	4,400	4,400
1036-00	Reactor Surveillance/Mainten	0	165
1037-00	D&D of the Hot Cells	81	2,100
1038-00	Hot Cells Surveillance/Maint	0	500
1039-00	D&D of the Juggernaut Reacto	0	0
1040-00	D&D of the Argonne Thermal S	0	0
1041-00	D&D of the 60" Cyclotron	0	0
1042-00	D&D of New Brunswick Laborat	3,570	3,570
1043-00	Surveillance/Maintenance of	0	0
1044-01	SFMP Technical Criteria and	175	175
1045-01	FUSRAP Technical Criteria an	120	100
1046-00	FUSRAP NEPA Process Planning	1,300	1,225
1047-00	SFMP NEPA Process Planning a	1,400	1,300
1048-00	Site A/Plot M Surveillance	100	110
1086-00	Decision Analysis Process fo	0	0
1186-00	100 Area Characterization	0	250
1187-00	Outfall Area Characterizatio	0	0
1188-00	CP-5 Site Characterization	0	0
1191-00	Sewage Collection System Cha	0	0
Subtotal CH , ARGONNE EAST , ER		15,091	17,402
=CH, ARGONNE EAST , CAT: TR			
1154-00	Transportation Communication	205	200
Subtotal CH , ARGONNE EAST , TR		205	200
=CH, ARGONNE EAST , CAT: WM			
1007-00	UST Upgrade/Replacement	0	0
1014-00	PCB Transformer Disposal	0	0
1016-00	Water Supply Covers	0	0
1020-00	DP/NM Site Cleanup	0	515
1021-00	Fernald Wastewater Cleanup	0	515
1053-00	Regulated Waste Minimization	10	10
1054-00	Rehabilitation of Waste Mana	800	400
1055-00	Hazardous, Radioactive, & Mi	600	425
1063-00	AGHCF Refurbishment and Wast	0	600
1064-00	QA Program for HLW Acceptanc	72	0
1065-00	HLW Technology	2,200	1,750
1073-00	Continuation of Operations	1,482	1,563
1074-00	Hazardous, Radioactive, and	229	242
1075-00	Hazardous, Radioactive, and	61	64
1076-00	Hazardous, Radioactive, and	266	281

ACTIVITY DATA SHEETS
SORTED BY OPERATIONS OFFICE, INSTALLATION, AND CATEGORY
(dollars in thousands)

ADS No.	Activity Title	FY91B	FY92R
1168-00	Materials Integration Office	60	60
1169-00	Materials Integration Office	60	60
1170-00	PCB Contaminated Transformer	0	0
1171-00	Sitewide EIS	0	200
1172-00	Preparation of Radionuclide	0	0
1173-00	RCRA Part B Permit	0	0
1189-00	Stormwater Discharge Charact	0	200
1192-00	ANL-E Five Year Plan Prepara	0	160
1193-00	Technical Review Group (B&R	70	60
1194-00	Technical Review Group (B&R	155	60
Subtotal CH , ARGONNE EAST , WM		6,065	7,165
Subtotal CH , ARGONNE EAST		28,349	33,599
=CH, ARGONNE WEST , CAT: CA			
1503-AB	UNDERGROUND STORAGE TANKS	0	10
1509-AA	LINERS-RADIOACTIVE SCRAP & W	378	283
1519-AA	RADIOACTIVE SCRAP & WASTE FA	229	236
Subtotal CH , ARGONNE WEST , CA		607	529
=CH, ARGONNE WEST , CAT: ER			
1501-	COCA ACTIVITIES	207	181
1507-	PCB SPILL CLEANUP	0	533
1514-AC	SURVEILLANCE AND MAINTENANCE	3	0
1515-AC	D&D LIQUID WASTE PROCESSING	0	1,255
1522-	ENVIRONMENTAL,SAFETY, AND HE	0	268
Subtotal CH , ARGONNE WEST , ER		210	2,237
=CH, ARGONNE WEST , CAT: WM			
1504-	ANL-W's REMOTE HANDLED TRANS	5	0
1505-AA	PROTOTYPE RADIOACTIVE SODIUM	0	300
1506-	RADIOACTIVE WASTE DISPOSAL	467	480
1508-	HAZARDOUS/MIXED WASTE OPERAT	156	166
1510-AA	RADIOACTIVE SCRAP & WASTE FA	725	754
1511-AA	TRAILERS-RCRA STORAGE PERMIT	0	0
1512-	PCB CAPACITOR DISPOSAL	0	26
1513-	RADIOACTIVE LIQUID WASTE TRE	248	255
1516-	SODIUM CONVERSION	0	0
1517-AB	UNDERGROUND STORAGE TANKS UP	0	0
1518-AA	RADIOACTIVE SCRAP & WASTE FA	0	0
1523-	LAB AND OFFICE BUILDING RADI	0	129
Subtotal CH , ARGONNE WEST , WM		1,601	2,110
Subtotal CH , ARGONNE WEST		2,418	4,876
=CH, BATTELLE COLUMBUS LABORATORIES , CAT: ER			
6001-00	Battelle Columbus Labs. Deco	3,647	1,104
6002-00	Battelle Columbus Labs. Deco	8,238	17,416
Subtotal CH , BATTELLE COLUMBUS , ER		11,885	18,520
Subtotal CH , BATTELLE COLUMBUS		11,885	18,520
=CH, BROOKHAVEN NATIONAL LABORATORY , CAT: CA			
2004-02	STORAGE TANK REMOVAL/UPGRADE	0	0
2005-01	UPGRADES TO DRUM STORAGE ARE	0	0
2007-01	CESSPOOL REMOVAL	0	0
2008-02	HAZARDOUS WASTE MANAGEMENT U	2,240	0
Subtotal CH , BROOKHAVEN NATIONA, CA		2,240	0
=CH, BROOKHAVEN NATIONAL LABORATORY , CAT: ER			
2001-00	GROUNDWATER MONITORING UPGRA	200	200
2002-02	ENVIRONMENTAL ASSESSMENTS AN	3,370	1,516
2011-00	D&D BGRR, PHASE I AND II	0	0
2012-01	D&D PLAN FOR THE BMRR	0	0
2014-01	D&D OF WASTE TANKS	0	0
2015-02	GROUNDWATER REMEDIATION I	0	0
2016-01	WASTE SITES CLOSURE	3,000	1,838
2031-01	ENVIRONMENTAL RISKS, COST EF	300	0
2033-00	RI/FS TECHNICAL SUPPORT	585	601
2069-00	PERFORMANCE ASSESSMENT RELIA	0	500
Subtotal CH , BROOKHAVEN NATIONA, ER		7,455	4,655
=CH, BROOKHAVEN NATIONAL LABORATORY , CAT: WM			
2003-02	SHIPMENT & DISPOSAL OF ACCUM	1,231	1,265
2006-00	DETECTOR STATION CONSTRUCTIO	0	0
2009-02	WASTE MINIMIZATION FACILITY	500	1,400
2010-01	HAZARDOUS WASTE MANAGEMENT U	0	0
2013-02	WASTE CONCENTRATION FACILITY	390	463
2017-02	HAZARDOUS/RADIOACTIVE WASTE	2,065	3,327
2032-00	INSTALLATION OF AUTOMATIC DI	0	0
2034-01	FLOOR DRAIN RECONNECTION	0	0
2035-00	SANITARY SYSTEM UPGRADES - P	0	0
Subtotal CH , BROOKHAVEN NATIONA, WM		4,186	6,455
Subtotal CH , BROOKHAVEN NATIONA		13,881	11,110
=CH, CER CORPORATION , CAT: WM			
8002-00	Technical Support Services -	0	0
Subtotal CH , CER CORPORATION , WM		0	0
Subtotal CH , CER CORPORATION		0	0
=CH, CH , CAT: ER			
8006-00	Program Support for Agreemen	0	50
8007-00	Program Support for Agreemen	0	20
8008-00	Program Support for Agreemen	0	50
8009-00	Program Support for Agreemen	0	50
8010-00	Program Support for Agreemen	0	20
Subtotal CH , CH , ER		0	190

(dollars in thousands)

ADS No.	Activity Title	FY91B	FY92R
=CH, CH , CAT: WM			
8011-00	Program Support - Chicago Op	0	500
8018-00	CH Waste Minimization Progra	0	44
Subtotal CH , CH , WM		0	544
Subtotal CH , CH		0	734
=CH, FERMILAB , CAT: CA			
4005-03	PCB CONTAMINATION CLEANUP	305	569
4007-03	LEAKING UNDERGROUND GAS TANK	0	0
4012-02	LEAKING UNDERGROUND GAS TANK	0	0
Subtotal CH , FERMILAB , CA		305	569
=CH, FERMILAB , CAT: ER			
4003-03	PCB CONTAMINATION ASSESSMENT	0	0
4004-03	PCB CLEANUP	0	0
4006-03	CHROMATE CLEANUP	0	0
4014-01	CHROMATE CONTAMINATION CLEAN	0	64
Subtotal CH , FERMILAB , ER		0	64
=CH, FERMILAB , CAT: WM			
4001-03	ACTIVATION PRODUCT RELEASE A	0	0
4002-03	TRANSFORMER SPILL ASSESSMENT	0	0
4008-02	WASTE HANDLING OPERATIONS	211	204
4009-02	RADIOACTIVE WASTE PROCESSING	289	233
4010-02	HAZARDOUS WASTE HANDLING & S	58	60
4011-02	WASTE TRANSPORTATION & DISPO	254	225
4013-01	REDUCTION OF PCB CONCENTRATI	233	240
4015-01	RADIOACTIVE WASTE PROCESSING	0	1,200
Subtotal CH , FERMILAB , WM		1,045	2,162
Subtotal CH , FERMILAB		1,350	2,795
=CH, HALLAM, NEBRASKA , CAT: ER			
8005-00	Hallam Surveillance and Main	10	75
Subtotal CH , HALLAM, NEBRASKA , ER		10	75
Subtotal CH , HALLAM, NEBRASKA		10	75
=CH, INSTITUTE FOR REGULATORY SCIENCE , CAT: WM			
8003-00	Best Available Science	0	0
Subtotal CH , INSTITUTE FOR REGU, WM		0	0
Subtotal CH , INSTITUTE FOR REGU		0	0
=CH, PIQUA, OHIO , CAT: ER			
8004-00	Piqua Surveillance and Maint	10	30
Subtotal CH , PIQUA, OHIO , ER		10	30
Subtotal CH , PIQUA, OHIO		10	30
=CH, PRINCETON PLASMA PHYSICS LABORATORY , CAT: CA			
3006-01	Underground Storage Tank Rem	32	270
Subtotal CH , PRINCETON PLASMA P, CA		32	270
=CH, PRINCETON PLASMA PHYSICS LABORATORY , CAT: WM			
3001-01	Improvements and Basin Liner	100	90
3003-01	Low Level Radioactive Waste	16	23
3004-01	Mixed Waste Management	6	8
3005-01	Hazardous Waste Disposal	365	515
3007-01	PCB Capacitor Removal	0	0
3008-01	Waste Minimization Program	0	14
Subtotal CH , PRINCETON PLASMA P, WM		487	650
Subtotal CH , PRINCETON PLASMA P		519	920
Subtotal CH		62,216	72,864
=HQ, , CAT: ER			
15-00	General Support Services	105	105
16-00	General Support Services	105	105
Subtotal HQ , , ER		210	210
Subtotal HQ ,		210	210
=HQ, HEADQUARTERS , CAT: ER			
2-00	Technical support to Environ	1,612	2,478
3-00	Technical Support to Environ	1,612	2,478
4-00	Technical Support Services t	305	550
5-00	Tech Support Services for FU	245	400
13-00	Technical Support Services f	541	1,100
100-AA	TECHNICAL SUPPORT SERVICES T	47,914	42,500
100-AB	Technical Support to Environ	2,040	2,040
100-AC	Decommissioning SPRU Facilit	0	0
2406-19	Maxey Flats Disposal Site	3,000	4,000
8001-	AGENCIES METHODOLOGY R&D (VP	1,819	1,942
Subtotal HQ , HEADQUARTERS , ER		59,088	57,488
=HQ, HEADQUARTERS , CAT: TR			
7643-	MANAGEMENT SUPPORT SERVICES	2,002	2,000
Subtotal HQ , HEADQUARTERS , TR		2,002	2,000

ACTIVITY DATA SHEETS
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(dollars in thousands)

ADS No.	Activity Title	FY91B	FY92R
=HQ, HEADQUARTERS , CAT: WM			
25-00	Program Direction	24,106	40,000
75-01	DOE LLW PERFORMANCE ASSESSME	600	700
201-01	NEPA DOCUMENTATION	4,000	5,000
202-01	CS CAPSULE RECOVERY PROJECT	5,500	6,500
203-01	TRANSURANIC WASTE ALTERNATIV	7,525	8,300
204-01	SUPPORT TO FIVE-YEAR PLAN/SI	5,000	5,000
205-01	IMPLEMENTATION OF DOE ORDER	2,000	2,000
206-01	INDEPENDENT REVIEW OF SAFETY	6,000	8,500
207-01	EM-30 SUPPORT SERVICES CONTR	5,000	5,000
208-01	OPERATIONAL EXCELLENCE	3,000	5,000
209-01	PROGRAM MANAGEMENT SUPPORT S	2,000	3,000
210-01	THE MANAGEMENT OF OFF-SITE G	3,466	5,200
211-01	INTEGRATED DATA BASE	475	500
212-01	WASTE MANAGEMENT INFORMATION	1,000	1,400
213-1	HEADQUARTERS OPERATIONAL REA	2,000	3,000
214-01	TECHNICAL REVIEW GROUPS(TRG)	2,000	3,000
215-01	HIGH-LEVEL WASTE DISPOSAL FE	0	197,000
225-01	WASTE ANALYTICAL LABORATORY	0	20,500
5000-AA	Program Direction	8,200	0
Subtotal HQ , HEADQUARTERS , WM		81,872	319,600
Subtotal HQ , HEADQUARTERS		142,962	379,088
Subtotal HQ		143,172	379,298
=ID, GRAND JUNCTIONS PROJECT OFFICE , CAT: ER			
2100-GA	MONTICELLO REMEDIAL ACTION P	1,702	0
2101-GA	MONTICELLO REMEDIAL ACTION P	2,683	13,072
2110-GA	MONTICELLO VICINITY PROPERTI	1,500	5,500
2120-GA	GRAND JUNCTION PROJECTS OFFI	2,566	6,621
2200-GA	UMTRA INACTIVE MILLSITES; TM	936	691
2201-GA	GRAND JUNCTION VICINITIES PR	26,315	18,291
2300-GA	LONG-TERM SURVEILLANCE AND M	890	2,016
2301-GA	LONG-TERM SURVEILLANCE AND M	0	0
2310-GA	FORMERLY UTILIZED SITES REME	200	0
Subtotal ID , GRAND JUNCTIONS PR, ER		36,792	46,191
=ID, GRAND JUNCTIONS PROJECT OFFICE , CAT: WM			
2400-GA	GRAND JUNCTION PROJECTS OFFI	0	4,310
Subtotal ID , GRAND JUNCTIONS PR, WM		0	4,310
Subtotal ID , GRAND JUNCTIONS PR		36,792	50,501
=ID, IDAHO CHEMICAL PROCESSING PLANT , CAT: CA			
1011-C1	MIXED WASTE RULE COMPLIANCE	0	0
1012-C1	NEW HEXONE PUMPING STATION	0	0
1014-C1	LIQUID EFFLUENT TREATMENT &	500	0
1018-C1	UNDERGROUND STORAGE TANKS	50	0
1028-C1	ENVIRONMENTAL CORRECTIONS AC	2,500	7,000
Subtotal ID , IDAHO CHEMICAL PRO, CA		3,050	7,000

ADS No.	Activity Title	FY91B	FY92R
=ID, IDAHO CHEMICAL PROCESSING PLANT , CAT: WM			
1001-C1	GENERAL WASTE MANAGEMENT OPE	16,087	20,940
1002-C1	HIGH-LEVEL WASTE OPERATIONS	16,495	20,175
1003-C1	TANK FARM/CALCINE STORAGE OP	1,350	2,070
1004-C1	HLW TANK FARM REPLACEMENT	16,600	63,700
1005-C1	DISPOSITION OF RADIOACTIVE &	2,030	2,110
1006-C1	ENVIRONMENTAL CORRECTIONS AC	7,500	0
1007-C1	OFF-GAS SYSTEM CONTROL, MONI	0	1,300
1008-C1	PEW EVAPORATOR REPLACEMENT	0	1,400
1009-C1	CPP-603 BASIN WATER DISPOSAL	0	0
1013-C1	HAZARDOUS WASTE CONTROL	0	0
1015-C1	NOx ABATEMENT	1,095	7,950
1016-C1	NWCF PROCESS OFF-GAS MONITOR	0	0
1017-C1	NEW PERCOLATION PONDS	251	400
1019-C1	HLW TANK FARM REPLACEMENT -	0	940
1020-C1	CPP-606 CHEMICAL NEUTRALIZIN	0	0
1021-C1	HAZARDOUS CHEMICAL CONTAINME	0	1,490
1022-C1	MIXED WASTE RULE MONITORING	0	2,000
1023-C1	SERVICE WASTE CLOSED LOOP CO	0	2,100
1024-C1	EMISSION MONITORS AT THE CFS	0	0
1026-C1	COVER CPP-621 CONTAINMENTS	0	400
1027-C1	ENVIRONMENTAL MONITORING	0	0
1029-C1	OPERATIONS SUPPORT BUILDING	0	1,100
1030-C1	IMPLEMENT NEWLY ISSUED DOE O	2,557	9,180
1035-C1	OSHA CORRECTIONS	1,410	1,260
1036-C1	WASTE CALCINE FACILITY DECON	0	600
1037-C1	INCREASED NWCF CAPACITY	0	1,000
1038-C1	ASBESTOS ABATEMENT PROJECT	0	3,000
1039-C1	ICPP SITE-SPECIFIC ENVIRONME	900	1,500
1040-C1	LIQUID EFFLUENT TREATMENT &	0	1,420
Subtotal ID , IDAHO CHEMICAL PRO, WM		66,275	146,035
Subtotal ID , IDAHO CHEMICAL PRO		69,325	153,035
=ID, IDAHO NATIONAL ENGINEERING LABORATO , CAT: CA			
11-E1	MIXED WASTE COMPLIANCE	9,050	0
102-E1	UNDERGROUND STORAGE TANKS	1,878	0
Subtotal ID , IDAHO NATIONAL ENG, CA		10,928	0
=ID, IDAHO NATIONAL ENGINEERING LABORATO , CAT: ER			
24-E1	TAN CIVILIAN SPENT FUEL STOR	1,050	0
27-E1	SURVEILLANCE AND MAINTENANCE	0	0
28-E1	ASSESSMENT OF TAN	3,232	1,819
28-E2	CLEANUP OF TAN	400	3,300
30-E1	ASSESSMENT OF TRA	2,993	6,500
30-E2	CLEANUP OF TRA	150	2,300
32-C1	ASSESSMENT OF ICPP - WAG 3	950	3,170
32-C2	CLEANUP OF ICPP	2,000	3,000
34-E1	ASSESSMENT OF CFA	2,104	1,830
34-E2	CLEANUP OF CFA	2,281	1,600
36-E1	ASSESSMENT OF PBF/ARA	900	85
36-E2	CLEANUP OF PBF/ARA	686	2,129
38-E1	ASSESSMENT OF EBR-1/BORAX	110	575

ACTIVITY DATA SHEETS
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(dollars in thousands)

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ADS No.	Activity Title	FY91B	FY92R
38-E2	CLEANUP OF EBR-1/BORAX	0	220
40-E1	BURIED WASTE PROGRAM	19,468	41,800
41-E1	ASSESSMENT OF MISCELLANEOUS	310	366
41-E2	CLEANUP OF MISCELLANEOUS UNI	0	0
43-E1	HQ SUPPORT	0	0
45-E1	D&D SURVEILLANCE AND MAINTEN	685	500
46-E1	ARVFS/NAK D&D CLEANUP	370	0
47-E1	INEL D&D PROGRAM SUPPORT	0	150
48-E1	ARA II ASSESSMENT	0	0
48-E2	ARA II CLEANUP	400	430
49-E1	ARA III ASSESSMENT	0	0
49-E2	ARA III CLEANUP	0	500
50-E1	WRRTF HOT WASTE TANK ASSESSM	0	110
50-E2	WRRTF HOT WASTE TANK CLEANUP	0	120
52-E1	ARA I ASSESSMENT	0	100
52-E2	ARA I CLEANUP	0	0
53-E1	TAN 607 DECON SHOP ASSESSMEN	0	0
53-E2	TAN 607 DECON SHOP CLEANUP	0	0
54-E1	MTR ASSESSMENT	0	290
54-E2	MTR CLEANUP	0	240
56-E1	ICPP ASSESSMENT	100	350
56-E2	ICPP CLEANUP	250	940
58-E1	CFA-669 HOT LAUNDRY ASSESSME	100	0
58-E2	CFA-669 HOT LAUNDRY CLEANUP	100	410
60-E1	ETR ASSESSMENT	0	310
60-E2	ETR CLEANUP	0	430
63-E1	BORAX-V	0	1,600
64-E1	SPERT-IV ANCILLARIES	50	0
65-E1	LOFT ANCILLARY EQUIPMENT ASS	70	0
65-E2	LOFT ANCILLARY EQUIPMENT CLE	0	330
67-E1	TTAF ASSESSMENT	0	520
67-E2	TTAF CLEAN-UP	0	0
102-E3	INACTIVE UNDERGROUND STORAGE	0	2,000
112-E1	INTERAGENCY AGREEMENT (IAG)	0	3,000
112-E2	DOE - SHOSHONE BANNOCK OVERS	0	300
Subtotal ID , IDAHO NATIONAL ENG, ER		38,759	81,324
=ID, IDAHO NATIONAL ENGINEERING LABORATO , CAT: WM			
1-E1	LLW TREATMENT (WERF)	8,155	7,850
2-E1	RWMC LLW OPERATIONS	5,113	5,883
2-E2	RWMC LLW TECHNOLOGY PROGRAMS	750	1,040
3-E1	IMPLEMENTATION OF 5820.2A CH	2,500	9,935
4-E1	LLWMP (DOE LLW TECHNICAL SUP	0	3,025
5-E1	LLW DISPOSAL SYSTEM (NEW)	0	1,465
6-E1	OCCUPATIONAL SAFETY & HEALTH	500	2,200
8-E1	TRU OPERATIONS	4,602	5,524
8-E2	TRU TECHNICAL PROGRAMS	1,900	3,175
8-E3	TRU EXAMINATION, CERTIFICATI	1,450	3,620
8-E4	TRANSPORTATION TO WIPP	915	150
8-E5	TRU RETRIEVAL OPERATIONS	0	2,700
8-E6	MOBILE NDE/NDA SYSTEM	0	1,200
8-E7	SHIP TO PREPP	0	220
8-E8	WIPP UNCERTAINTIES	0	5,120
10-E1	PREPP WASTE TREATMENT	13,425	11,180
11-E2	MIXED WASTE COMPLIANCE	0	9,700
13-E1	5820.2A CHAPTER II (TRU)	0	0

ADS No.	Activity Title	FY91B	FY92R
14-E1	IDAHO WASTE PROCESSING FACIL	266	3,800
16-E1	SITE ENVIRONMENTAL MONITORIN	5,951	5,625
17-E1	WASTE ENGINEERING DEVELOPMEN	2,965	6,015
18-E1	HWP STORAGE AND STAGING	100	2,000
19-E1	ISU MONITORING	0	215
19-E2	STATE MONITORING	1,500	1,500
20-E1	WASTE MINIMIZATION	1,550	1,550
25-E1	LONG-TERM STORAGE OF TMI-2 F	3,500	9,924
26-E1	NLLWMP (NATIONAL LLW PROGRAM	0	4,000
43-E2	HQ SUPPORT	0	0
69-E1	DOT COMPLIANCE FOR ON SITE W	200	2,000
71-E1	NEW INEL SANITARY LANDFILL	2,350	14,300
76-E1	WASTE MANAGEMENT NEPA	6,000	9,500
101-E1	TSA RETRIEVAL ENCLOSURE FACI	12,180	23,940
101-E2	TRU WASTE CHARACTERIZATION A	21,720	53,750
102-E2	UNDERGROUND STORAGE TANKS	0	1,700
107-E2	CANISTER FABRICATION	0	0
111-E1	GREATER THAN CLASS C LOW-LEV	0	8,500
113-E1	SUPPORT TO WIPP	0	14,500
114-10	WILLOW CREEK BUILDING (WCB)	0	0
114-11	DOE LANDLORD INFRASTUCTURE S	0	9,800
114-12	ON-SITE PROGRAM SUPPORT	0	5,065
114-13	OFF-SITE PORGRAM SUPPORT	0	2,835
114-E1	INEL LANDLORD INFRASTRUCTURE	16,888	31,496
114-E2	IDAHO LANDLORD INFRASTRUCTUR	0	0
114-E3	INEL ROAD RENOVATION	7,300	7,411
114-E4	INEL TRANSPORTATION COMPLEX	870	5,500
114-E5	INEL SEWER SYSTEM UPGRADE	0	2,100
114-E6	INEL FIRE AND LIFE SAFETY IM	0	7,000
114-E7	INEL RADIO COMMUNICATION UPG	0	0
114-E8	INEL ELECTRICAL UPGRADE	0	0
114-E9	INEL RESEARCH CENTER LABORAT	0	1,206
Subtotal ID , IDAHO NATIONAL ENG, WM		122,650	309,219
Subtotal ID , IDAHO NATIONAL ENG		172,337	390,543
=ID, WEST VALLEY , CAT: WM			
4001-W1	WEST VALLEY DEMONSTRATION PR	90,000	104,000
4002-W1	WEST VALLEY DEMONSTRATION PR	0	9,000
4003-W1	WEST VALLEY DEMONSTRATION PR	0	11,000
Subtotal ID , WEST VALLEY , WM		90,000	124,000
Subtotal ID , WEST VALLEY		90,000	124,000
Subtotal ID		368,454	718,079
=NV, EG&G/EM OFFICES , CAT: WM			
307-AA	HAZARDOUS WASTE ACCUMULATION	134	138
Subtotal NV , EG&G/EM OFFICES , WM		134	138

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ACTIVITY DATA SHEETS
SORTED BY OPERATIONS OFFICE, INSTALLATION, AND CATEGORY
(dollars in thousands)

ADS No.	Activity Title	FY91B	FY92R
	Subtotal NV , EG&G/EM OFFICES	134	138
=NV, NEVADA OFF-SITE LOCATIONS , CAT: ER			
214-AA	OFF-SITE LOCATION CERCLA PRO	207	1,775
227-AA	OFF-SITE LOCATION CERCLA REM	0	0
230-AA	Compliance Oversight - Alask	0	250
231-AA	Compliance Oversite - Colora	0	250
235-AA	Compliance Oversight - Missi	0	250
236-AA	Compliance Oversight - New M	0	250
	Subtotal NV , NEVADA OFF-SITE LO, ER	207	2,775
	Subtotal NV , NEVADA OFF-SITE LO	207	2,775
=NV, NEVADA TEST SITE , CAT: CA			
101-AA	POTABLE WATER SYSTEM PROTECT	150	0
102-AA	EMPLACEMENT OF SURVEYED FENC	41	195
103-AA	SEWAGE SYSTEM UPGRADE	0	0
105-AA	ENVIRONMENTAL PROTECTION PRO	292	1,300
106-AA	RADIATION PROTECTION/DOE DRA	0	0
107-AA	STEAM CLEANING EFFLUENT DISP	203	0
108-AA	ABANDONED SEPTIC TANKS	150	165
109-AA	RCRA PERMIT FOR MIXED WASTE	0	0
	Subtotal NV , NEVADA TEST SITE , CA	836	1,660
=NV, NEVADA TEST SITE , CAT: ER			
201-AA	PROGRAM MANAGEMENT AND PLANN	350	1,000
202-AA	GROUNDWATER CHARACTERIZATION	10,800	31,500
203-AA	ACTIVE TUNNEL POND AND MUCKP	200	500
204-AA	YUCCA FLAT RI/FS	250	900
205-AA	FRENCHMAN FLAT RI/FS	0	0
206-AA	PAHUTE MESA RI/FS	0	400
207-AA	RAINIER MESA RI/FS	400	400
208-AA	SHOSHONE MOUNTAIN RI/FS	0	0
209-AA	SUMP AND INJECTION WELL RI/F	0	200
210-AA	INACTIVE TANK RI/FS	250	250
211-AA	CONTAMINATED WASTE SITE RI/F	0	0
212-AA	LEACHFIELD RI/FS	0	0
213-AA	INACTIVE MUCKPILE AND TUNNEL	0	0
215-AA	RI/FS AT THE NTS, TONOPAH TE	200	200
216-AA	CLOSURE PLAN DEVELOPMENT AND	1,450	1,500
217-AA	PU CONTAMINATED SOIL CLEAN-U	0	0
218-AA	PU CONTAMINATED SOIL CLEAN-U	0	0
219-AA	PU CONTAMINATED SOIL CLEAN-U	0	0
220-AA	ACTIVE TUNNEL POND AND MUCKP	0	0
221-AA	SUMP AND INJECTION WELL REME	0	0
222-AA	INACTIVE TANK REMEDIATION	0	0
223-AA	LEACHFIELD REMEDIATION	0	0
224-AA	INACTIVE MUCKPILE AND TUNNEL	0	0
225-AA	DECONTAMINATION AND DECOMMIS	0	210
226-AA	COMPLIANCE OVERSIGHT	0	1,000
228-AA	ATMOSPHERIC TESTING DEBRIS D	0	0
229-AA	POST-EVENT LOCATION CHARACTE	0	250
232-AA	DECONTAMINATION & DECOMMISSI	0	0
234-AA	ATMOSPHERIC TESTING DEBRIS D	0	800

ADS No.	Activity Title	FY91B	FY92R
	Subtotal NV , NEVADA TEST SITE , ER	13,900	39,110
=NV, NEVADA TEST SITE , CAT: TR			
415-AA	TRANSPORTATION OPERATIONS	0	300
	Subtotal NV , NEVADA TEST SITE , TR	0	300
=NV, NEVADA TEST SITE , CAT: WM			
233-AA	PROGRAM DIRECTION	0	2,184
301-AA	DEFENSE WASTE CONTINUITY OF	4,155	11,132
302-AA	NTS LOW-LEVEL WASTE DISPOSAL	500	650
304-AA	NTS MIXED WASTE DISPOSAL	400	1,000
305-AA	TRANSURANIC WASTE STORAGE	660	980
308-AA	40 CFR 191 COMPLIANCE ASSESS	1,600	4,000
309-AA	NVO PROGRAM SUPPORT	200	385
310-AA	NTS WASTE MINIMIZATION - PLA	40	40
312-AA	HAZARDOUS WASTE ACCUMULATION	375	905
313-AA	LOW-LEVEL WASTE DISPOSAL OPE	0	0
314-AA	MIXED WASTE DISPOSAL OPERATI	0	0
315-AA	NTS WASTE MINIMIZATION IMPLE	320	510
316-AA	COMPLIANCE OVERSIGHT - WASTE	0	900
317-AA	ALTERNATIVE DISPOSAL PRACTIC	0	0
318-AA	ATMOSPHERIC TESTING DEBRIS D	225	0
	Subtotal NV , NEVADA TEST SITE , WM	8,475	22,686
	Subtotal NV , NEVADA TEST SITE	23,211	63,756
	Subtotal NV	23,552	66,669
=OR, FEED MATERIALS PRODUCTION CENTER , CAT: CA			
1-A1	AIR QUALITY IMPROVEMENTS	3,892	1,600
2-A2	WATER QUALITY IMPROVEMENTS	25,037	13,572
26-A3	CORRECTIVE ACTIONS DEVELOPME	0	315
	Subtotal OR , FEED MATERIALS PRO, CA	28,929	15,487
=OR, FEED MATERIALS PRODUCTION CENTER , CAT: ER			
4-B1	REMEDIAL INVESTIGATION/FEASI	17,940	6,953
5-B2	ENVIRONMENTAL REMEDIAL ACTIO	28,037	73,578
6-B2	FMPC CERCLA CLEANUP	22,591	23,395
8-B1	INTERIM RESTORATION ENGINEER	4,446	9,542
9-B3	REQUIRED CLOSURES AND REMOVA	342	3,702
10-B4	FIELDS BROOK & LASKIN POPLAR	3,700	5,350
11-B4	RMI SITEWIDE CLEANUP AND RES	2,496	4,600
12-B5	FMPC DECONTAMINATION & DECOM	0	20,455
27-B4	RMI SURFACE SOIL RESTORATION	2,930	5,870
30-B2	OEPA ENVIRONMENTAL MONITORIN	0	1,500
	Subtotal OR , FEED MATERIALS PRO, ER	82,482	154,945
=OR, FEED MATERIALS PRODUCTION CENTER , CAT: WM			
3-C1	RCRA COMPLIANCE ACTIVITIES	3,303	3,319
13-C1	WASTE MANAGEMENT UPGRADES	5,928	3,526

(dollars in thousands)

ADS No.	Activity Title	FY91B	FY92R
14-C1	CONTINUITY OF OPERATIONS	2,820	2,754
15-C3	WASTE TREATMENT UPGRADES	55	2,535
16-C3	BACKLOG LOW LEVEL WASTE PROC	3,894	4,717
17-C3	WASTE TREATMENT	1,067	1,123
19-C4	LOW LEVEL WASTE STORAGE	4,561	5,337
20-C5	MIXED WASTE DISPOSITION	2,384	2,752
21-C5	WASTE MANAGEMENT OPERATIONS	20	0
22-C3	CURRENT GENERATED WASTE PROC	1,043	1,657
23-C5	CURRENT GENERATED WASTE SHIP	1,617	6,064
31-C5	BACKLOG LOW LEVEL WASTE DISP	5,966	8,236
33-C2	WASTE MINIMIZATION IMPLEMENT	202	213
34-C2	WASTE MINIMIZATION PLANNING	79	84
35-C5	DOE SCRAP METAL PROGRAM	81	86
36-D1	FMPC POST-SHUTDOWN LANDLORD	0	1,640
Subtotal OR , FEED MATERIALS PRO, WM		33,020	44,043
Subtotal OR , FEED MATERIALS PRO		144,431	214,475
=OR, FORMERLY UTILIZED SITES REMEDIAL A , CAT: ER			
101-AA	Assessment	3,249	431
102-AA	Cleanup	2,731	5,237
103-AA	Assessment	3,455	1,641
104-AA	Cleanup	7,276	9,550
105-AA	Assessment	4,991	2,854
106-AA	Cleanup	2,847	13,005
108-AA	Assessment/Cleanup	7,751	14,378
Subtotal OR , FORMERLY UTILIZED , ER		32,300	47,096
Subtotal OR , FORMERLY UTILIZED		32,300	47,096
=OR, OAK RIDGE GASEOUS DIFFUSION PLANT , CAT: CA			
402-GF	K-1501 STEAM PLANT OPACITY I	200	730
403-GF	TOXICITY REDUCTION	195	1,345
404-GF	SEWAGE COLLECTION SYSTEM REH	525	525
433-GF	NPDES MONITORING EQUIPMENT	0	160
Subtotal OR , OAK RIDGE GASEOUS , CA		920	2,760
=OR, OAK RIDGE GASEOUS DIFFUSION PLANT , CAT: ER			
405-C1	BASELINE SURVEILLANCE & MAIN	487	514
405-C2	BASELINE SURVEILLANCE & MAIN	8,203	8,532
405-G1	BASELINE SURVEILLANCE & MAIN	11,680	12,333
405-G2	BASELINE SURVEILLANCE & MAIN	5,941	6,179
406-C1	HAZARDOUS MAT. MGMT. FOR H&S	271	106
406-C2	HAZARDOUS MAT. MGMT. FOR H&S	1,819	3,192
406-G1	HAZARDOUS MAT. MGMT. FOR H&S	5,221	2,540
406-G2	HAZARDOUS MAT. MGMT. FOR H&S	389	2,312
407-CD	SURVEILLANCE AND MAINTENANCE	1,400	2,590
408-C1	TOXIC SUBSTANCES CONTROL ACT	817	0
408-G1	TOXIC SUBSTANCES CONTROL ACT	9,669	0
409-C1	K-1407-B and -C SLUDGE FIXAT	600	0
409-G1	K-1407-B and -C SLUDGE FIXAT	500	0
410-CD	HAZARDOUS CENTRIFUGE EQUIPME	2,020	1,050
411-CD	REMEDIAL INVESTIGATIONS	5,317	9,925
411-GF	REMEDIAL INVESTIGATIONS	4,350	8,121
412-CD	SITE REMEDIATION	165	3,356
412-GF	SITE REMEDIATION	135	2,745
413-CD	Off-Site Investigations	410	875
413-GF	Off-Site Investigations	1,850	3,898
414-C1	HAZARDOUS MAT. MGMT. TO ACHI	184	96
414-C2	HAZARDOUS MAT. MGMT. TO ACHI	3,596	17,134
414-G1	HAZARDOUS MAT. MGMT. TO ACHI	4,416	2,302
414-G2	HAZARDOUS MAT. MGMT. TO ACHI	2,604	12,407
415-CD	PCB VENTILATION GASKET SPILL	5,800	6,384
415-GF	PCB VENTILATION GASKET SPILL	4,200	4,623
416-C1	ASSESSMENT ACTIVITIES IN SUP	0	189
416-C2	ASSESSMENT ACTIVITIES IN SUP	0	0
416-G1	ASSESSMENT ACTIVITIES IN SUP	0	4,548
416-G2	ASSESSMENT ACTIVITIES IN SUP	0	0
417-CD	CENTRIFUGE FACILITIES CLEANU	0	4,930
418-C1	CONSTRUCTION OF D&D SUPPORT	0	200
418-C2	CONSTRUCTION OF D&D SUPPORT	0	0
418-G1	CONSTRUCTION OF D&D SUPPORT	0	4,800
418-G2	CONSTRUCTION OF D&D SUPPORT	0	0
436-CD	CENTRIFUGE WORKERS STUDY	0	230
437-CD	GROUNDWATER PROTECTION PROGR	1,155	2,152
437-GF	GROUNDWATER PROTECTION PROGR	945	1,760
439-C1	RADIATION CONTAMINATION CONT	46	95
439-C2	RADIATION CONTAMINATION CONT	171	1,682
439-G1	RADIATION CONTAMINATION CONT	1,104	2,286
439-G2	RADIATION CONTAMINATION CONT	3,390	1,218
440-C1	SPECIAL PROJECTS IN SUPPORT	1,514	33
440-C2	SPECIAL PROJECTS IN SUPPORT	1,781	1,596
440-G1	SPECIAL PROJECTS IN SUPPORT	1,334	784
440-G2	SPECIAL PROJECTS IN SUPPORT	1,289	1,156
441-GF	FEDERAL FACILITY AGREEMENT -	0	3,892
442-GF	Oak Ridge Operations Scrap M	0	0
455-GF	ENVIRONMENTAL RESTORATION IN	0	3,049
459-GF	WASTE INFORMATION NETWORK SY	0	6,058
463-GF	PROGRAM SUPPORT - FACILITY A	0	1,552
Subtotal OR , OAK RIDGE GASEOUS , ER		94,773	153,424
=OR, OAK RIDGE GASEOUS DIFFUSION PLANT , CAT: WM			
409-CB	SLUDGE MANAGEMENT	0	6,607
409-GB	SLUDGE MANAGEMENT	0	5,406
419-CD	WASTE STORAGE I	965	7,704
419-GF	WASTE STORAGE I	790	6,374
420-CD	WASTE DISPOSAL I	313	959
420-GF	WASTE DISPOSAL I	256	785
421-GF	RESERVATION WASTE MANAGEMENT	2,925	5,450
422-CD	WASTE MINIMIZATION	0	1,953
422-GF	WASTE MINIMIZATION	0	2,483
423-CD	WASTE TREATMENT I	802	3,787
423-GF	WASTE TREATMENT I	881	4,652
424-GF	LOW-LEVEL WASTE DISPOSAL FAC	800	11,600
425-GF	OAK RIDGE FILTER TEST FACILI	260	301
426-CD	TOXIC SUBSTANCES CONTROL ACT	3,905	0
426-GF	TOXIC SUBSTANCES CONTROL ACT	5,536	0
426-KG	TOXIC SUBSTANCES CONTROL ACT	639	0

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ACTIVITY DATA SHEETS
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(dollars in thousands)

ADS No.	Activity Title	FY91B	FY92R
427-CD	WASTE STORAGE II	0	1,730
427-GF	WASTE STORAGE II	0	2,265
428-GF	ROOFS FOR STORAGE TANKS	0	145
429-	WASTE MANAGEMENT INSTRUMENTA	0	2,393
430-CD	WASTE TREATMENT II	0	542
430-GF	WASTE TREATMENT II	0	443
431-GF	CENTRAL NEUTRALIZATION FACIL	0	75
432-GF	WASTE STAGING FACILITY (LINE	0	75
434-GF	OAK RIDGE OPERATIONS SCRAP M	0	1,000
435-GF	SOLIDIFIED SLUDGE STORAGE FA	0	50
438-GF	LANDLORD CAPITAL I	0	31,013
443-GF	LANDLORD CAPITAL II	0	36,439
450-CD	TOXIC SUBSTANCES CONTROL ACT	0	12,863
450-GF	TOXIC SUBSTANCES CONTROL ACT	0	21,769
452-GF	WASTE MANAGEMENT INFORMATION	0	1,400
456-GF	WASTE MANAGEMENT OPERATIONS	0	3,400
460-GF	WASTE MANAGEMENT WASTE MINIM	0	4,739
468-	AIRBORNE HAZARDOUS SUBSTANCE	0	1,038
Subtotal OR , OAK RIDGE GASEOUS , WM		18,072	179,440
Subtotal OR , OAK RIDGE GASEOUS		113,765	335,624
=OR, OAK RIDGE NATIONAL LABORATORY , CAT: CA			
302-	Solid-LIP Bethel Valley; LLW	8,413	500
304-	Melton Valley LLLW-CAT SYS.	250	4,200
310-	Subtitle I USTs	1,950	1,500
Subtotal OR , OAK RIDGE NATIONAL, CA		10,613	6,200
=OR, OAK RIDGE NATIONAL LABORATORY , CAT: ER			
311-AA	WAG Surveillance and Mainten	1,785	2,840
311-AB	Remedial Action and Fugitive	2,200	10,361
312-	WAG Surveillance and Mainten	315	575
313-AA	SFMP Surveillance & Maintena	210	465
313-AB	Molten Salt Reactor Experime	0	165
314-	Defense D&D Surveillance & M	630	1,285
315-	Energy Research D&D Surveill	205	365
317-	FUSRAP Radiological Surveys	1,000	1,005
318-	UMTRAP Radiological and Veri	487	89
319-	Integrated Data Base Program	80	105
320-	SFMP Verification and Design	163	160
322-	Site Investigation - GF	3,345	2,500
323-	Site Investigation - KG	430	340
324-AA	ORNL RI/FS WAG 1 - GF	6,486	4,231
324-AB	ORNL RI/FS WAG 2	672	0
324-AC	ORNL RI/FS WAG 3	0	3,176
324-AD	ORNL RI/FS WAG 4	4,607	5,254
324-AE	ORNL RI/FS WAG 5	1,941	4,408
324-AF	ORNL RI/FS WAG 7	6,397	6,356
324-AG	ORNL RI/FS WAG 9	0	0
324-AH	ORNL RI/FS WAG 10	5,746	4,443
324-AJ	ORNL RI/FS WAG 11 - GF	0	0
324-AK	ORNL RI/FS WAG 13 - GF	0	0
324-AM	ORNL RI/FS WAG 17 - GF	0	0
325-AA	ORNL RI/FS WAG 1 - KG	2,750	532
325-AB	ORNL RI/FS WAG 8	0	0
325-AC	ORNL RI/FS WAG 11 - KG	0	0
325-AD	ORNL RI/FS WAG 13 - KG	0	0
325-AE	ORNL RI/FS WAG 17 - KG	0	0
326-	ORAU RI/FS	400	1,520
328-	OHF Pond Stabilization	0	500
329-	ORNL Interim Corrective Meas	4,425	14,675
330-	ORNL Interim Corrective Meas	0	1,100
331-	Inactive Underground Storage	11,000	43,100
332-AA	General Site Closures	0	150
332-AB	WAG 6 Closure	4,625	23,900
333-	Hydrofracture Closure	2,475	4,000
338-AB	Molten Salt Reactor Experime	0	0
338-AC	Shielded Transfer Tanks Deco	0	0
338-AD	ORR Experimental Facilities	0	0
339-AA	Metal Recovery Facility Deco	0	1,310
339-AB	Fission Product Development	0	725
339-AC	Homogeneous Reactor Experime	0	105
339-AD	Fission Product Pilot Plant	0	0
339-AE	Waste Evaporator Facility De	0	0
339-AF	Old Hydrofracture Facility D	0	0
339-AG	Low Intensity Test Reactor D	0	0
340-AA	Energy Research Decommission	0	125
340-AB	High Level Radiation Analyti	0	500
340-AC	Abandoned Underground Storag	0	0
363-	ORNL WAG 6 RFI/CMS	330	0
376-AA	SFMP Remedial Action Informa	42	105
376-AB	FUSRAP Remedial Action Infor	35	105
376-AC	UMTRAP Remedial Action Infor	35	105
376-AD	Defense D&D Program Remedial	0	105
379-	FUSRAP Review	0	0
380-	SFMP General IVC Radiologica	0	90
381-	GJPORAP Independent Verifica	0	105
383-	CSX Site Characterization	0	500
384-	CSX Site Remediation	0	0
387-	ORNL Isotope Facilities Shut	0	4,180
Subtotal OR , OAK RIDGE NATIONAL, ER		62,816	145,660
=OR, OAK RIDGE NATIONAL LABORATORY , CAT: WM			
341-	Waste Treatment	1,970	4,500
342-	Waste Treatment	2,892	5,735
343-	Waste Treatment	3,768	5,321
344-	Waste Storage	1,070	2,260
346-	Waste Disposal	1,510	3,090
347-	Waste Disposal	0	700
348-	Waste Disposal	2,567	2,899
349-	Continuity of Operations	6,064	11,370
350-	Continuity of Operations	9,817	10,455
351-	Mixed Waste Characterization	0	0
352-	Waste Treatment-Solid-LIP WH	4,350	10,740
353-	Continuity-Solid-LIP Waste C	375	300
355-	Waste Minimization	420	1,170
356-	Waste Minimization	1,000	1,175
366-	Waste Treatment-Water - PWTP	250	2,300
378-	Active LLLW Tank FFA Complia	870	3,925
382-	Sanitary and Industrial Effl	0	3,115

(dollars in thousands)

ADS No.	Activity Title	FY91B	FY92R
386-	Sealed Source Storage Progra	0	0
Subtotal OR , OAK RIDGE NATIONAL, WM		36,923	69,055
Subtotal OR , OAK RIDGE NATIONAL		110,352	220,915
=OR, OR ASSOC. UNIVERS. , CAT: CA			
924-	MINORITY STUDENTTS HAZ. MATE	0	48
Subtotal OR , OR ASSOC. UNIVERS., CA		0	48
=OR, OR ASSOC. UNIVERS. , CAT: ER			
910-	ER AND WM EMPLOYMENT AND EDU	0	182
911-	ER/WM GRADUATE FELLOWSHIP PR	0	962
912-	ER/WM TECHNICIAN EDUCATION/W	0	0
913-	TECHNICAL ASSISTANCE TO OFF.	0	120
914-	ORAU VARIABLE DOSE FACILITY	0	250
915-	ORAU ENVIRONMENTAL RESTORATI	0	1,570
916-	ORAU SOUTH CAMPUS CLEANUP	0	300
917-	RADIOLOGICAL SITE ASSESSMENT	630	782
918-	RADIOLOGICAL SITE ASSESSMENT	117	215
921-	ER/WM SCHOLARSHIP PROGRAM	0	999
923-	ER/WM YOUNG FACULTY RESEARCH	0	810
925-	ER/WM MINORITY SCHOLARSHIP/F	0	250
926-	ER/WM MINORITY SCHOLARSHIP/F	0	69
927-	ER/WM MINORITY PRECOLLEGE OU	0	273
Subtotal OR , OR ASSOC. UNIVERS., ER		747	6,782
=OR, OR ASSOC. UNIVERS. , CAT: TR			
950-	TRANSCOM	870	910
951-	Shipment Mobility/Accountabi	450	635
955-	Regulatory Compliance Traini	1,700	2,299
956-	Regulatory Compliance Traini	0	500
957-	Information and Communicatio	385	570
959-	ANSI N14 PACKAGING AND TRANS	55	58
Subtotal OR , OR ASSOC. UNIVERS., TR		3,460	4,972
=OR, OR ASSOC. UNIVERS. , CAT: WM			
920-	WASTE MANAGEMENT FOR RESEARC	0	34
922-	LAB GRADUATE RESEARCH PARTIC	0	0
Subtotal OR , OR ASSOC. UNIVERS., WM		0	34
Subtotal OR , OR ASSOC. UNIVERS.		4,207	11,836
=OR, ORO - DIRECT , CAT: ER			
801-	Site Investigations and Asse	5,923	20,100
810-	Assessment, Verification, an	0	500
812-	CEER D&D Project Indirects A	0	0
Subtotal OR , ORO - DIRECT , ER		5,923	20,600

ADS No.	Activity Title	FY91B	FY92R
=OR, ORO - DIRECT , CAT: TR			
958-	Program Support	30	45
Subtotal OR , ORO - DIRECT , TR		30	45
=OR, ORO - DIRECT , CAT: WM			
802-	Technical Waste Management P	1,044	4,700
803-AA	Cesium Incident Recovery Act	0	0
811-	Surveillance and Maintenance	19	16
Subtotal OR , ORO - DIRECT , WM		1,063	4,716
Subtotal OR , ORO - DIRECT		7,016	25,361
=OR, PADUCAH GASEOUS DIFFUSION PLANT , CAT: CA			
501-	Biological Monitoring	0	780
502-	KPDES Compliance (1993 LIP)	0	50
504-	Reduction of PCB Contaminati	2,750	9,369
526-	Classified Burial Ground Clo	0	0
533-	KPDES Compliance Projects (G	0	1,700
535-	PCB Wastewater Treatment Sys	0	810
Subtotal OR , PADUCAH GASEOUS DI, CA		2,750	12,709
=OR, PADUCAH GASEOUS DIFFUSION PLANT , CAT: ER			
510-	D&D Surveillance and Mainten	754	1,011
511-	Site Investigation for Groun	4,949	1,426
512-	Remedial Action for Groundwa	0	3,000
513-	Site Investigation for Poten	12,742	22,829
514-	Remedial Action for Potentia	125	50
515-	Remedial Action for Potentia	1,740	2,242
516-	Remedial Action for Potentia	175	250
Subtotal OR , PADUCAH GASEOUS DI, ER		20,485	30,808
=OR, PADUCAH GASEOUS DIFFUSION PLANT , CAT: WM			
503-	Dike Upgrades	0	0
505-	Chlorinated Solvent Eliminat	261	25
506-	1992 Wastewater Treat Sys C-	0	1,170
518-	Waste Management Operations/	0	8,827
520-	WM Oper/Disposal - Low-Level	520	50
521-	WM Oper/Storage - Storage Fa	40	612
522-	Solid Waste Landfill	131	25
523-	WM Operations/Disposal - Scr	0	1,613
524-	Mixed Waste Storage Facility	53	1,000
525-	Low Level Radiation Detectio	0	0
527-	Residential Landfill	753	0
528-	Scrap Metal Storage and Disp	156	375
529-	Poll & Waste Data Mgmt Sys &	0	750
530-	PCB Facility, Sludge Volume	425	0
532-	Mixed Waste Treatment System	0	200
Subtotal OR , PADUCAH GASEOUS DI, WM		2,339	14,647
Subtotal OR , PADUCAH GASEOUS DI		25,574	58,164

ACTIVITY DATA SHEETS
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(dollars in thousands)

ADS No.	Activity Title	FY91B	FY92R
=OR, PORTSMOUTH GASEOUS DIFFUSION PLANT , CAT: CA			
601-AA	Improvements to Meet Current	750	440
602-AA	PB/PCB Control Improvements	2,750	7,985
627-AA	PB/PCB Lube Oil Replacement	3,000	0
Subtotal OR , PORTSMOUTH GASEOUS, CA		6,500	8,425
=OR, PORTSMOUTH GASEOUS DIFFUSION PLANT , CAT: ER			
609-AA	RFI/CMS/MGT	7,605	14,300
610-AA	UST's/AST's	1,100	800
611-AA	Corrective Measures Implemen	0	4,000
613-AA	RCRA Closures	0	0
614-AA	Corrective Measures Implemen	0	0
615-AA	GCEP TERMINATION	0	5,280
625-AA	GCEP Termination (Surveillan	2,473	2,300
628-AA	Demolition of Abandoned Faci	0	1,200
Subtotal OR , PORTSMOUTH GASEOUS, ER		11,178	27,880
=OR, PORTSMOUTH GASEOUS DIFFUSION PLANT , CAT: WM			
606-AA	Continuity of Operations (NP	0	330
616-AA	Treatment (Continuity of Ope	2,670	3,350
617-AA	TREATMENT-RCRA/TSCA/MIXED IN	150	170
618-AA	Storage/Waste Storage Facili	0	0
619-AA	LLW Disposal Facility	190	180
620-AA	Mixed Waste Storage	40	3,000
622-AA	Treatment Mixed Waste - X-70	2,575	2,600
624-AA	Disposal-LL Scrap Metal Reco	0	50
629-AA	Low Level Radiation Monitori	0	0
630-AA	Waste Management/Continuity	0	7,630
631-AA	Classified Waste Disposal Fa	0	0
632-AA	STORAGE - RADIOACTIVE SCRAP	0	0
Subtotal OR , PORTSMOUTH GASEOUS, WM		5,625	17,310
Subtotal OR , PORTSMOUTH GASEOUS		23,303	53,615
=OR, SFMP NIAGARA FALLS STORAGE SITER , CAT: ER			
109-AA	Cleanup	2,265	530
Subtotal OR , SFMP NIAGARA FALLS, ER		2,265	530
Subtotal OR , SFMP NIAGARA FALLS		2,265	530
=OR, WELDON SPRING SITE REMEDIAL ACTIONS , CAT: ER			
704-	Environmental Compliance For	934	1,873
705-	REMEDIATE WELDON SPRING SITE	24,998	49,610
919-	RADIOLOGICAL SITE ASSESSMENT	53	60
Subtotal OR , WELDON SPRING SITE, ER		25,985	51,543
Subtotal OR , WELDON SPRING SITE		25,985	51,543

ADS No.	Activity Title	FY91B	FY92R
=OR, Y-12 , CAT: CA			
204-	Steam Plant Ash Disposal Fac	6,000	8,122
244-	Nonpermitted Plant Drains	0	3,075
245-	Treatment Plant Discharges	0	1,775
246-	Cooling Water Discharges	0	700
247-	Non-Point Source Pollution C	0	700
248-	DEPLETED URANIUM OXIDATION F	0	600
250-	Cooling Towers	0	805
Subtotal OR , Y-12 , CA		6,000	15,777
=OR, Y-12 , CAT: ER			
209-G1	EFPC Activities Assessment	1,400	0
209-G2	EFPC Activities - Remediatio	100	10,038
210-G1	Reduction of Mercury in Plan	200	238
210-G2	Reduction of Mercury in Plan	1,100	2,838
211-G1	RCRA Closures Phase I (CAPCA	1,500	0
212-G1	RCRA TSD Facility Closures	1,000	765
214-G1	RCRA Corrective Measures - C	417	666
214-G2	RCRA Corrective Measures - B	278	457
214-G3	RCRA Corrective Measures - U	2,085	3,142
215-G1	CERCLA Corrective Actions	2,500	3,430
216-G1	Site Investigations & Assess	1,050	1,120
216-G2	Site Investigations & Assess	700	759
216-G3	Site Investigations & Assess	5,250	5,451
217-G1	Bear Creek Valley NEPA Docum	300	137
218-G1	Bear Creek Valley Corrective	500	338
218-G2	Bear Creek Valley Corrective	500	738
219-G1	3004(U) RCRA/CERCLA Rem. Inv	600	758
219-G2	3004(U) RCRA/CERCLA Rem. Inv	80	118
219-G3	3004(U) RCRA/CERCLA Rem. Inv	120	0
220-	ERP Waste Treatment/Disposal	3,000	4,037
221-G1	Tank Cleanup	560	407
222-G1	Decontamination & Decommissi	0	0
243-G1	RCRA Phase II Postclosure Ac	2,500	1,499
243-G2	RCRA Phase II Post Closure A	5,400	13,255
252-G1	Decontamination & Decommissi	0	650
253-G1	Decontamination & Decommissi	0	100
254-	Surveillance & Maintenance,	0	480
255-	Surveillance & Maintenance,	0	180
Subtotal OR , Y-12 , ER		31,140	51,601
=OR, Y-12 , CAT: WM			
208-	Environmental Surveillance U	605	505
223-AA	TREATMENT	15,748	32,972
223-AB	TREATMENT-PRIVATIZATION	0	23,790
224-	STORAGE	4,563	13,340
225-	DISPOSAL	5,553	11,942
226-	CONTINUITY OF OPERATIONS	8,652	18,996
228-	PRODUCTION WASTE STORAGE FAC	5,500	9,238
229-	WASTE MINIMIZATION	0	9,795
232-	PRODUCTION WASTE TREATMENT F	0	1,100
234-	PRODUCTION WASTE TREATMENT F	0	4,095
235-	SANITARY & INDUSTRIAL WASTEW	0	1,550
257-	Y-12 TECHNICAL WASTE MANAGEM	0	225

(dollars in thousands)

ADS No.	Activity Title	FY91B	FY92R
Subtotal OR , Y-12	, WM	40,621	127,548
Subtotal OR , Y-12		77,761	194,926
	Subtotal OR	566,959	1,214,085
=RF, ROCKY FLATS PLANT , CAT: CA			
79-	POND SEDIMENT CONTROL	140	565
82-	VOC MONITORING	0	0
83-	UPGRADE RADIOACTIVE STACK SA	0	792
88-	SITE NEPA STRATEGY AND STUDI	0	0
108-	PREPARE AIR POLLUTION EMISSI	558	0
109-	SURVEY AND IDENTIFY EXISTING	350	1,220
110-	AUGMENT SAMPLING AND ANALYSI	333	0
111-	DISPERSION MODELING OF PLANT	0	344
112-	EFFLUENT TREATMENT FACILITIE	0	0
3288-	SEWAGE TREATMENT PLANT UPGRA	0	0
Subtotal RF , ROCKY FLATS PLANT , CA		1,381	2,921
=RF, ROCKY FLATS PLANT , CAT: ER			
1001-A	OPERABLE UNIT 1 (881 HILLSID	0	588
1001-B	OPERABLE UNIT 1 (881 HILLSID	500	361
1002-A	OPERABLE UNIT 2 903 PAD, MOU	3,716	1,539
1002-B	OPERABLE UNIT 2 (903 PAD, MO	0	243
1004-A	OPERABLE UNIT 3, COMBINED PH	0	0
1004-B	OPERABLE UNIT 3 COMBINED PHA	0	0
1005-A	OPERABLE UNIT 4 (PRIORITY 1	4,500	6,113
1005-B	OPERABLE UNIT 4 (PRIORITY 1	0	0
1006-A	OPERABLE UNIT 5 (700 AREA) A	2,000	3,614
1006-B	OPERABLE UNIT 5 (700 AREA) R	0	0
1007-A	OPERABLE UNIT 6 (400/800 ARE	0	1,451
1007-B	OPERABLE UNIT 6 (400/800 ARE	0	0
1008-A	OPERABLE UNIT 7 (100 AREA) A	0	2,189
1008-B	OPERABLE UNIT 7 (100 AREA) R	0	0
1009-	OPERABLE UNIT 8 (LOW PRIORIT	0	0
1010-A	OPERABLE UNIT 9 (RADIOACTIVE	0	3,505
1010-B	OPERABLE UNIT 9 (RADIOACTIVE	0	0
1011-	OPERABLE UNIT 10 (NON-DISCER	42	536
1012-	SITE WIDE PROGRAMS ASSESSMEN	7,400	10,552
1018-	OPERABLE UNIT 3 INSIDE BUILD	0	0
1231-A	OTHER CLOSURE ASSESSMENTS	3,166	2,687
1231-B	OTHER CLOSURE PLAN REMEDIATI	62	127
1233-	ER PROGRAM MANAGEMENT	1,534	9,185
1251-A	OPERABLE UNIT 3, SWMU 121 (O	3,300	401
1251-B	ORIG. PROCESS WASTE LINES RE	0	202
1255-A	RFP SANITARY LANDFILL CLOSUR	887	379
1255-B	RFP SANITARY LANDFILL CLOSUR	3,813	166
1258-A	SOLAR POND CLOSURE ASSESSMEN	200	608
1258-B	SOLAR POND CLOSURE REMEDIATI	7,100	216
1261-A	WEST SPRAY FIELD ASSESS	1,780	621
1261-B	WEST SPRAY FIELD REMEDIATION	0	293
1263-A	OXNARD FACILITY ASSESSMENT	500	116
1263-B	OXNARD FACILITY REMEDIATION	0	0

ADS No.	Activity Title	FY91B	FY92R
Subtotal RF , ROCKY FLATS PLANT , ER		40,500	45,692
=RF, ROCKY FLATS PLANT , CAT: WM			
0-	WASTE MINIMIZATION	0	0
81-	RCRA COMPLIANCE PROGRAM MANA	0	8,087
90-	WASTE & ENVIRONMENTAL DATA M	0	0
3131-	ACTIVE/PASSIVE NEUTRON DRUM	990	0
3134-	ADVANCED SIZE REDUCTION FACI	700	0
3135-	BUILDING 374 LIQUID WASTE TR	0	588
3136-	BUILDING 569 ADDITION	560	0
3137-	BUILDING 776 UPGRADE, PHASE	540	164
3139-	CRATE AND DRUM COUNTING AREA	0	0
3142-	ES&H ENHANCEMENT - FILTRATIO	0	0
3143-	WERF SUPPORT AND TREATMENT S	0	2,980
3146-	IMPROVE ADVANCED SIZE REDUCT	556	0
3148-	LIQUID WASTE OPERATIONS, BUI	6,369	10,249
3149-	LIQUID WASTE OPERATIONS, BUI	2,958	6,957
3150-	LLW MIXED STORAGE FACILITY	0	1,100
3151-	LOW LEVEL WASTE SIZE REDUCTI	0	0
3153-	NEW LANDFILL	1,836	1,244
3156-	NITRATE SALT IMMOBILIZATION	0	0
3157-	OFFSITE TRANSPORTATION OF WA	0	1,018
3158-	ORGANIC PROCESS SYSTEM, BUIL	0	0
3160-	PROCESS WASTE TRANSFER SYSTE	0	2,782
3161-	REAL-TIME RADIOGRAPHY	0	0
3162-	REPLACE BUILDING 668	0	230
3164-	SALTCRETE DISPOSAL	122	0
3166-	SLUDGE IMMOBILIZATION SYSTEM	926	2,736
3167-	SLUDGE IMMOBILIZATION SYSTEM	0	0
3168-	SOLID WASTE OPERATIONS, NON-	11,680	12,475
3169-	SOLID WASTE OPERATIONS, PSZ	3,579	7,200
3171-	SUPERCOMPACTOR &REPACKAGING	0	990
3174-	WASTE EVAPORATOR RENOVATION	0	150
3177-	WASTE MANAGEMENT PROGRAM SUP	14,729	29,670
3242-A	WASTE MINIMIZATION	468	1,406
3242-B	WASTE MINIMIZATION	600	1,090
3259-	HAZARDOUS WASTE FACILITY UPG	679	2,139
3260-A	WASTE CERTIFICATION	0	2,480
3260-B	WASTE CERTIFICATION	0	2,602
3286-	WASTE CEMENTATION UPGRADES	0	0
3287-	COMPREHENSIVE WASTEWATER MAN	0	0
3290-	IMPLEMENT COMPREHENSIVE WAST	0	1,132
3291-	CAN & DRUM COUNTER CONTROL &	0	160
3293-	PROGRAM SUPPORT FOR COMPLIAN	0	3,986
3294-A	PAYMENT TO THE STATE OF COLO	0	2,305
3294-B	PAYMENT TO THE STATE OF COLO	0	2,000
3295-	FILTER TEST FACILITY OPERATI	0	1,068
3296-	FACILITIES ENGINEERING SUPPO	0	2,112
3297-	SAMPLING AND ANALYSIS OF SUR	0	615
3298-A	STEAM CLEANING	0	0
3400-	SLUDGE IMMOBILIZATION SYSTEM	0	4,578
3401-A	FLUIDIZED BED UNIT	0	2,000
4108-A	CEMENTATION	0	0
4118-A	POLYMER SOLIDIFICATION	0	0
9999-ZZ	Sanitary Waste Treatment	0	0
Subtotal RF , ROCKY FLATS PLANT , WM		47,292	118,293

ACTIVITY DATA SHEETS
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(dollars in thousands)

ADS No.	Activity Title	FY91B	FY92R
	Subtotal RF , ROCKY FLATS PLANT	89,173	166,906
	Subtotal RF	89,173	166,906
=RL, HANFORD , CAT: CA			
404-KE	AIR PERMITTING/COMPLIANCE CH	519	539
406-KE	CORRECT ACTIONS FOR CHEM PRO	2,865	0
410-KE	PART B PERMITTING - PUREX	2,555	0
411-KE	NUCLEAR MTLS PROD PART B PER	1,239	0
2001-AR	NUCLEAR ENERGY RCRA PERMITS/	600	0
3000-NR	N REACTOR RCRA PERMITS/CLOSU	1,162	0
3009-NR	N REACTOR AIR MONITORING INS	640	0
6155-U3	AIR PERMITTING/COMPLIANCE (L	675	675
8005-PC	LIGHT BALLAST PCB CLEANUP AN	150	150
8100-PC	ENVIRONMENTAL CORRECTIVE ACT	170	3,045
9062-MJ	ENVIR MONITORING - RCRA GW M	0	10,285
9092-WM	AIR PERMITTING/COMPLIANCE	1,714	2,290
9111-1B	DST - HEC (TPA)(W1B)	263	4,290
9112-1B	DST PERMITTING (TPA) (W1B)	678	0
9119-1B	DST INTERIM STATUS COMPLIANC	2,700	1,000
9125-1D	B PLANT PART B PERMIT (1W1D1	1,686	0
9201-2K	SOLID WASTE MANAGEMENT PERMI	1,940	0
9207-2K	SOLID MIXED WASTE STORAGE FA	1,800	1,800
9307-3B	SST INTERIM STATUS COMPLIANC	670	703
	Subtotal RL , HANFORD , CA	22,026	24,777
=RL, HANFORD , CAT: ER			
5000-E2	ERRA MANAGEMENT	7,850	16,364
5002-E2	ERRA PROGRAM SUPPORT	7,400	20,290
5004-E2	RCRA STATE OVERSIGHT	600	600
5005-E2	CERCLA STATE OVERSIGHT	1,000	1,000
5023-E2	YAKIMA INDIAN NATION REVIEW	0	342
5024-E2	UMATILLA INDIAN NATION REVIE	0	342
5025-EB	100-HR-1 CHARACTERIZATION AN	0	6,128
5026-EB	100-HR-1 CHARACTERIZATION AN	0	6,102
5027-EB	100-DR-1 CHARACTERIZATION AN	0	5,639
5028-EB	100-BC-1 CHARACTERIZATION AN	0	5,976
5029-EB	100-BC-5 CHARACTERIZATION AN	0	5,495
5030-EB	100-KR-1 CHARACTERIZATION AN	0	2,731
5031-EB	100-KR-4 CHARACTERIZATION AN	0	3,140
5032-EB	100-NR-1 CHARACTERIZATION AN	0	1,893
5033-EB	100-NR-3 CHARACTERIZATION AN	0	2,190
5034-EB	100-FR-1 CHARACTERIZATION AN	0	1,268
5035-EB	100-BC-2 CHARACTERIZATION AN	0	807
5036-EB	100-DR-2 CHARACTERIZATION AN	0	948
5037-EB	100-KR-2 CHARACTERIZATION AN	0	547
5038-EB	100-NR-2 CHARACTERIZATION AN	0	0
5039-EB	100-KR-3 CHARACTERIZATION AN	0	0
5040-EB	100-IU-1 CHARACTERICATION AN	0	0
5041-EB	100-BC-3 CHARACTERIZATION AN	0	0
5042-EB	100-BC-4 CHARACTERIZATION AN	0	0
5043-EB	100-DR-3 CHARACTERIZATION AN	0	0
5044-EB	100-FR-2 CHARACTERIZATION AN	0	0

ADS No.	Activity Title	FY91B	FY92R
5045-EB	100-HR-2 CHARACTERIZATION AN	0	0
5046-EB	100-IU-2 CHARACTERIZATION AN	0	0
5075-EC	300-FF-1 CHARACTERIZATION AN	0	7,225
5076-EC	300-FF-5 CHARACTERIZATION AN	4,476	5,215
5077-EC	300-FF-3 CHARACTERIZATION AN	0	0
5078-EC	300-FF-2 CHARACTERIZATION AN	0	0
5079-EC	300-IU-1 CHARACTERIZATION AN	0	0
5100-ED	1100-EM-1 CHARACTERIZATION A	5,494	4,370
5125-EE	200-BP-1 CHARACTERIZATION AN	5,724	3,317
5126-EE	200-UP-2 CHARACTERIZATION AN	0	954
5127-EE	200-BP-5 CHARACTERIZATION AN	0	1,007
5128-EE	200-ZP-1 CHARACTERIZATION AN	0	827
5129-EE	200-BP-4 CHARACTERIZATION AN	0	585
5130-EE	200-EP-11 CHARACTERIZATION A	0	333
5131-EE	200-PO-2 CHARACTERIZATION AN	0	19
5132-EE	200-PO-5 CHARACTERIZATION AN	0	0
5133-EE	200-TP-1 CHARACTERIZATION AN	0	0
5134-EE	200-BP-2 CHARACTERIZATION AN	0	0
5135-EE	200-TP-4 CHARACTERIZATION AN	0	0
5136-EE	200-TP-2 CHARACTERIZATION AN	0	0
5137-EE	200-ZP-2 CHARACTERIZATION AN	0	0
5138-EE	200-PO-1 CHARACTERIZATION AN	0	0
5139-EE	200-BP-4 CHARACTERIZATION AN	0	0
5140-EE	200-SO-1 CHARACTERIZATION AN	0	0
5141-EE	200-IU-3 CHARACTERIZATION AN	0	0
5142-EE	200-RO-2 CHARACTERIZATION AN	0	0
5143-EE	200-BP-6 CHARACTERIZATION AN	0	0
5144-EE	200-RO-3 CHARACTERIZATION AN	0	0
5145-EE	200-UP-1 CHARACTERIZATION AN	0	0
5146-EE	200-BP-8 CHARACTERIZATION AN	0	0
5147-EE	200-RO-1 CHARACTERIZATION AN	0	0
5148-EE	200-IU-4 CHARACTERIZATION AN	0	0
5149-EE	200-NO-1 CHARACTERIZATION AN	0	0
5175-EF	SINGLE-SHELL TANK WASTE CHAR	3,144	7,710
5176-EF	SINGLE-SHELL TANK (SST) WAST	18,520	18,970
5202-EG	TECHNICAL SUPPORT TO REMEDIA	0	3,636
5225-EJ	RADIATION AREA REMEDIAL ACTI	869	3,290
5226-EJ	RADIATION AREA REMEDIAL ACTI	1,900	1,900
5227-EJ	RADIATION AREA REMEDIAL ACTI	0	0
5228-EJ	INACTIVE UNDERGROUND STORAGE	0	0
5229-EJ	INACTIVE UNDERGROUND STORAGE	1,075	425
5250-EK	LABORATORY AND DRILLING UPGR	20,426	26,000
5275-EM	100-HR-1 REMEDIAL ACTION	0	0
5276-EM	100-HR-3 REMEDIAL ACTION	0	2,000
5277-EM	100-DR-1 REMEDIAL ACTION	0	0
5278-EM	100-BC-1 REMEDIAL ACTION	0	0
5279-EM	100-BC-5 REMEDIAL ACTION	0	0
5280-EM	100-KR-1 REMEDIAL ACTION	0	0
5281-EM	100-KR-4 REMEDIAL ACITON	0	0
5283-EM	100-BC-2 REMEDIAL ACTION	0	0
5300-EN	300-FF-1 REMEDIAL ACTION	0	0
5301-EN	300-FF-5 REMEDIAL ACTION	0	2,000
5325-EP	1100-EM-1 REMEDIAL ACTION	0	5,000
5375-ES	200-BP-1 REMEDIAL ACTION	0	0
5400-EV	A-29 DITCH STABILIZATION AND	400	0
5401-EV	183-H SOLAR BASINS D&D	6,060	6,300
5402-EV	NON-RADIOACTIVE DANGEROUS WA	984	2,090

(dollars in thousands)

ADS No.	Activity Title	FY91B	FY92R
5403-EV	B-POND BY-PASS	504	0
5404-EV	B-POND STABILIZATION AND CLO	608	900
5405-EV	216-A-10 CRIB CLOSURE	0	0
5406-EV	216-U-12 CRIB CLOSURE	0	580
5407-EV	216-A-36B CRIB CLOSURE	0	0
5408-EV	300 AREA EFFLUENT TREATMENT	0	0
5409-EV	276-S-141 AND 276-S-142 HEXO	0	600
6100-U1	HANFORD SITE D&D MANAGEMENT/	2,598	2,550
6150-U3	100/200 AREAS SURVEILLANCE A	4,820	5,250
6156-U3	AIR PERMITTING/COMPLIANCE (L	0	0
6200-U5	DEFENSE D&D PROGRAM ADMINIST	0	0
6225-UA	100 AREA ANCILLARY FACILITIE	0	2,051
6251-UB	100 AREA REACTORS	4,730	6,500
6252-UB	SURPLUS PRODUCTION REACTORS	0	0
6275-UE	224-B CONCENTRATION FACILITY	0	2,100
6276-UE	201-C SEMIWORKS	1,574	2,465
6277-UE	233-S FACILITY DECON & DECOM	0	150
6350-UV	SURVEILLANCE AND MAINTENANCE	500	525
6351-UV	100/200/300 AREAS SITE CLEAN	0	525
6375-UC	EFFLUENT FACILITIES	0	926
7006-PE	209-E SURVEILLANCE AND MAINT	75	75
7009-PE	324 & 325 BUILDING HOT CELL	0	5,750
7010-PE	SURVEILLANCE & MAINTENANCE F	525	550
7020-PE	209-E DECONTAMINATION & DECO	0	700
7021-PE	ENVIRONMENTAL RESTORATION IN	0	4,400
8172-PE	327 BUILDING SURVEILLANCE AN	0	500
8173-PE	327 BUILDING HOT CELL CLEANO	0	3,000
8182-PE	324 SHIELDED MATERIAL FACILI	0	525
Subtotal RL , HANFORD , ER		101,856	225,597
=RL, HANFORD , CAT: TR			
9991-1X	TRANSPORTATION MANAGEMENT DI	1,120	1,220
9992-1X	TRANSPORTATION MANAGEMENT DI	417	405
9993-1X	TRANSPORTATION MANAGEMENT DI	993	1,225
9994-1X	TRANSPORTATION MANAGEMENT DI	825	990
9995-1X	TRANSPORTATION MANAGEMENT DI	90	120
9996-1X	TRANSPORTATION MANAGEMENT DI	260	260
Subtotal RL , HANFORD , TR		3,705	4,220
=RL, HANFORD , CAT: WM			
100-RL	PROGRAM DIRECTION	0	14,934
400-KE	CHEM PROC T PLANT RCRA/CERCL	0	220
401-KE	PFP LIQUID LLW PROCESS WASTE	0	400
402-KE	PFP SOLID WASTE REDUCTION SY	0	200
405-KE	DISCONTINUE DISPOSAL TO SOIL	0	1,335
407-KE	CHEM PROCESS FACILITY ENVIRO	1,087	2,020
408-KE	DISCONTINUE DISPOSAL TO SOIL	271	560
409-KE	CHEM PROCESS CONTINUITY OF O	12,521	0
412-KE	CHEM PROCESS CONTINUITY OF O	0	0
414-KE	CHEM PROCESS SOLID WASTE DIS	5,397	6,701
415-KE	T-PLANT OPERATIONS	0	8,015
416-KE	PUREX/UO3 OPERATIONS	30,183	122,784
417-KE	PUREX OPERATIONS CHANGE IN I	0	165
418-KE	PROCESSING PWR CORE II IN PU	0	3,050
419-KE	PROCESSING FFTF SPENT FUEL I	0	10,000
420-KE	PART B PERMITTING - PUREX	0	303
421-KE	PART B PERMITTING - PFP, T-P	0	2,220
422-KE	CHEMICAL PROCESSING CAPITAL	0	4,153
423-KE	AIR PERMITTING/COMPLIANCE CH	0	0
1000-F1	200 AREA STEAM SYSTEM (LANDL	0	2,705
1001-F1	HANFORD SITE LAUNDRY SYSTEM	9,960	3,760
1002-F1	UNDERGROUND STORAGE TANK UPG	127	703
1003-F1	INFRASTRUCTURE SUPPORT	0	8,020
1004-F1	INFRASTRUCTURE SUPPORT	1,120	4,020
1005-F1	CORE ACTIVITIES (LANDLORD)	23,442	23,943
1006-F1	LANDLORD PROGRAM SAFETY COMP	11,040	9,010
1007-F1	300 AREA ELEC DISTRIBUTION C	1,010	6,640
1008-F1	ROAD, GROUND AND LIGHTING SA	0	890
1009-F1	HANFORD ENVIRONMENTAL DOSE R	3,500	3,557
1010-F1	DEMOLITION OF INFRASTRUCTURE	0	2,100
1012-F1	SAFETY ANALYSIS REPORTS (NUC	0	400
1013-F1	SAFETY COMPLIANCE - 300 AREA	0	2,400
1014-F1	324 FACILITY COMPLIANCE/RENO	0	200
1015-F1	325 FACILITY COMPLIANCE/RENO	0	15
1017-F1	SAFETY UPGRADES - 300 AREA L	0	2,250
1019-F1	HEAVY CONSTRUCTION EQUIP./CO	0	1,850
1020-F1	LARGE SCALE SCIENTIFIC SYSTE	0	16,200
2000-AR	NUCLEAR ENERGY WASTE MANAGEM	0	0
2002-AR	PCB TRANSFORMER REMOVAL AT F	0	0
2003-AR	308 BUILDING STANDBY SURVEIL	414	525
2004-AR	STORAGE FACILITY MONITORING	23	74
2005-AR	NUCLEAR ENERGY WASTE ASSESSM	153	600
2006-AR	NUCLEAR ENERGY RCRA PERMITS/	0	416
3002-NR	N REACTOR FACILITY ASSESSMEN	0	0
3003-NR	N REACTOR UNDERGROUND STORAG	0	600
3004-NR	N REACTOR ENVIRONMENTAL MONI	2,970	600
3007-NR	N REACTOR RCRA CLOSURE IMPLE	0	560
3008-NR	N REACTOR SOLID WASTE DISPOS	2,762	3,300
3012-NR	N REACTOR RESIDUAL MATERIAL	0	3,150
3013-NR	N REACTOR RCRA PERMITS/CLOSU	0	2,300
4000-1V	HANFORD WASTE VITRIFICATION	98,500	201,289
4001-1V	HANFORD WASTE VITRIFICATION	0	28,845
7008-PW	WASTE MANAGEMENT SUPPORT FOR	200	0
7014-PW	LIQUID WASTE SOURCE CONTROL	3,666	4,200
8000-PW	ENVIRONMENTAL MONITORING/SUR	7,571	10,860
8002-PW	WASTE MANAGEMENT OPERATIONS	2,266	2,375
8008-PW	MATERIALS CHARACTERIZATION C	0	265
8009-PW	RMW STORAGE TANK UPGRADES (P	0	475
8010-PW	BUILDING UTILITIES - PHASE I	200	31
8011-PW	329 BUILDING COMPLIANCE (PNL	1,800	3,200
8014-PW	LLW SORTING/SCANNING TABLE (	0	945
8015-PW	WASTE TREATMENT MELTER (PNL)	0	250
8017-PW	HAZARDOUS WASTE TREATMENT FA	1,170	3,230
8164-PW	TRU WASTE STORAGE	0	850
8174-PW	CONTINUATION OF DEMONSTRATIO	0	3,025
8180-PW	HANFORD PERSONNEL DOSIMETRY	0	1,786
9010-HX	PROJECTS TECHNICAL SUPPORT O	2,321	4,432
9050-MH	ENVIRONMENTAL PLANNING & REP	4,909	7,500
9051-MH	ENVIRONMENTAL PLANNING & REP	0	0
9052-MH	ENVIRONMENTAL PLANNING & REP	0	0
9053-MH	ENVIRONMENTAL PLANNING & REP	0	0
9054-MH	ENVIRONMENTAL PLANNING & REP	0	0

ACTIVITY DATA SHEETS
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(dollars in thousands)

ADS No.	Activity Title	FY91B	FY92R
9055-MH	TRI-PARTY AGREEMENT MANAGEME	790	900
9056-MH	TRI-PARTY AGREEMENT (MH)	0	0
9057-MH	TRI-PARTY AGREEMENT(MH)	0	0
9058-MH	TRI-PARTY AGREEMENT(MH)	0	0
9059-MH	TRI-PARTY AGREEMENT STATE FU	500	500
9060-MJ	ENVIRONMENTAL MONITORING GRO	0	600
9061-MJ	ENVIRONMENTAL MONITORING - P	0	1,333
9063-MJ	ENVIR MONITORING - ENVIR MON	1,660	6,342
9064-MJ	ENVIR MONITORING - GW MON WE	0	2,000
9067-MJ	ENVIR MONITORING - PURGEWATE	0	2,000
9068-MJ	ENVIR MONITORING - TRANSITIO	0	834
9070-ML	SOLID WASTE DISPOSAL OPERATI	0	0
9080-MS	300 AREA RADIOACTIVE LIQUID	2,086	4,050
9090-WM	WASTE MANAGEMENT GENERAL SUP	218	250
9091-WM	AIR PERMITTING/COMPLIANCE	0	0
9093-WM	FACILITY REGULATORY COMPLIAN	0	600
9094-WM	PUREX LIQUID EFFLUENT TREATM	1,310	10,000
9095-WM	PFP LIQUID LOW LEVEL SYSTEM,	3,492	4,000
9096-WM	PFP EFFLUENT TREATMENT, HEC	7,071	8,100
9097-WM	DST TREAT-242-A/PUREX REGULA	5,238	2,000
9098-WM	MISC. WASTE MANAGEMENT GPPs,	0	2,000
9099-XX	HANFORD COMPUTER REPLACEMENT	0	1,620
9100-1B	DST STORAGE OPERATIONS ASSUR	0	2,900
9101-1B	DST STORAGE OPERABILITY REST	0	6,530
9103-1B	DST TREATMENT OPERATIONS ASS	0	1,010
9104-1B	244-AR VAULT--PRETREATMENT A	0	6,553
9105-1B	DST TECHNICAL SAFETY APPRAIS	0	2,500
9106-1B	DST PROGRAM SUPPORT (W1B)	8,987	9,436
9107-1B	DST STORAGE PACEE (W1B)	825	4,110
9108-1B	DST STORAGE OPERATIONS (W1B)	21,431	22,835
9109-1B	DST TREATMENT OPERATIONS (W1	5,975	5,903
9110-1B	244-AR VAULT--INACTIVE STATU	663	700
9113-1B	DST TREATMENT TECHNOLOGY (W1	394	414
9114-1B	DST TREATMENT PACEE (W1B)	2,700	1,400
9115-1B	DST STORAGE TECHNOLOGY (W1B)	1,364	1,432
9117-1B	DST TREATMENT PACEE RETRIEVA	0	3,040
9118-1B	DST TREATMENT RETRIEVAL SYS	0	1,800
9120-1B	DST STORAGE TANK FARM VENT U	3,720	4,371
9121-1B	DST STORAGE AGING WASTE TRAN	4,265	6,275
9122-1B	DST PERMITTING (NOD)(TPA) (W	0	484
9126-1D	PROJECT SUPPORT- HEC LINE IT	8,392	8,810
9127-1D	B PLANT CONTINUITY OF OPERAT	4,902	7,827
9128-1D	B PLANT PRETREATMENT (W1D)	170	1,323
9129-1D	OPERATIONS- TREATMENT (W1D)	29,268	36,517
9130-1D	PROJECT SUPPORT- PLANT AND P	5,285	12,131
9131-1D	PROJECT SUPPORT- CANYON CRAN	4,490	6,063
9132-1D	SOIL COLUMN DISPOSAL PLAN PR	718	1,378
9133-1D	PROJECT SUPPORT- SAFETY CLAS	1,150	6,830
9134-1D	PROJECT SUPPORT- TRUEX (W1D)	0	2,900
9135-1D	PROJECT SUPPORT-CELL CLEANOU	500	1,100
9150-1H	DEFENSE HIGH-LEVEL WASTE TEC	17,507	24,360
9175-1P	GROUT DISPOSAL PROGRAM	34,951	61,225
9176-1P	GROUT DISPOSAL PROGRAM (W1P)	0	740
9190-1V	HANFORD WASTE VITRIFICATION	400	1,640
9200-2K	LAND DISPOSAL ALTERNATIVES (	0	265
9202-2K	SODIUM INVENTORY REDUCTION (	0	695
9203-2K	SOLID MIXED WASTE STORAGE FA	1,375	3,652
9204-2K	SOLID WASTE BURIAL GROUND CL	0	4,720
9206-2K	WASTE RETRIEVAL TECHNOLOGY A	500	4,500
9208-2K	WASTE RECEIVING AND PROCESSI	1,795	9,800
9209-2K	RMW INCINERATION AT INEL (W2	0	750
9210-2K	SOLID WASTE DISPOSAL OPERATI	492	12,503
9211-2K	TRUPACT SHIPMENTS TO WIPP (W	0	2,000
9212-2K	ADVANCED LOW LEVEL WASTE DIS	0	750
9214-2K	RMW DISPOSAL TRENCH (W-025)(	0	2,150
9215-2K	NON-RADIOACTIVE HAZARDOUS WA	0	3,000
9216-2K	TRUSAF OPERATIONS (W2K)	0	3,050
9217-2K	LOW LEVEL WASTE VOLUME REDUC	0	2,650
9218-2K	WASTE RECEIVING AND PROCESSI	0	0
9219-2K	SOLID WASTE MANAGEMENT PERMI	0	2,410
9300-3B	SST PROGRAM SUPPORT (W3B)	2,050	2,150
9301-3B	SST STORAGE PACEE (W3B)	0	100
9302-3B	SST STORAGE OPERATIONS (W3B)	9,151	10,029
9304-3B	SST TREATMENT PACEE (W3B)	690	3,900
9305-3B	SST TREATMENT OPERATIONS (TP	9,110	9,637
9308-3B	SST STORAGE OPERATIONS ASSUR	0	800
9309-3B	SST STORAGE OPERABILITY REST	0	8,250
9310-3B	SST TREATMENT OPERATIONS ASS	0	500
9311-3B	SST TECHNICAL SAFETY APPRAIS	0	1,105
9400-4A	ENVIR SURV & CONTROL-GENERAL	2,333	2,440
9401-4A	ENVIR SURV & CONTROL-TREATED	2,998	16,905
9402-4A	ENVIR SURV & CONTROL-ENVIRON	0	125
9403-4A	ENVIR SURV & CONTROL-SURVEIL	6,984	7,775
9404-4A	ENVIR SURV & CONTROL-SHUTDOW	867	550
9406-4A	EFFLUENT TREATMENT FACILITY	1,627	2,552
9445-4L	ENVIRONMENTAL HOT CELL EXPAN	2,578	10,189
9446-4L	ENVIRONMENTAL LABORATORY UPG	13,214	18,845
9447-4L	(W4L43) WASTE SAMPLING AND C	10,478	100
9491-4X	WASTE OPERATIONS ASSESSMENTS	6,491	9,370
9500-5C	CESIUM CAPSULE RECOVERY (1W5	0	5,450
9550-5E	WESF (1W5E)	3,392	4,972
9600-6G	PLANNING (W6G)	0	2,385
9601-6G	WASTE TREATABILITY (W6G)	0	1,550
9603-6G	MIXED WASTE LAND DISPOSAL RE	0	3,125
9645-6L	222-S LABORATORY FACILITY CO	8,110	14,824
9646-6L	222-S LABORATORY HVAC/ELECTR	4,200	1,241
9691-6S	INVENTORY ADMINISTRATION (W6	1,700	1,785
9692-6S	INVENTORY CHANGE (W6S2)	46	569
9693-WM	STATE ENVIRONMENTAL OVERSIGH	481	550
Subtotal RL , HANFORD	WM	499,667	1,047,740
Subtotal RL , HANFORD		627,254	1,302,334
Subtotal RL		627,254	1,302,334
=SAN, , CAT: WM			
0-06	5 YEAR ERWM PLANNING SUPORT	100	200
0-07	MONITORING AGREEMENT WITH TH	0	3,700
0-14	PROGRAM DIRECTION - SALARIES	0	2,770
0-15	PROGRAM DIRECTION - BENEFITS	0	496
0-16	PROG DIRECTION- CONTRAC	100	500

(dollars in thousands)

ADS No.	Activity Title	FY91B	FY92R
0-17	PROG DIREC TRAVEL	0	197
Subtotal SAN, , WM		200	7,863
Subtotal SAN,		200	7,863
=SAN, CANOGA PARK, CA , CAT: ER			
5004-AA	Atomics International DeSoto	500	0
Subtotal SAN, CANOGA PARK, CA , ER		500	0
Subtotal SAN, CANOGA PARK, CA		500	0
=SAN, GENERAL ATOMICS , CAT: ER			
3-AA	D & D of GA Fuel Fabricating	0	0
4-AA	Hot Cell Decontamination and	0	1,715
Subtotal SAN, GENERAL ATOMICS , ER		0	1,715
Subtotal SAN, GENERAL ATOMICS		0	1,715
=SAN, GENERAL ELECTRIC , CAT: ER			
5-AA	Hot Cell / Glove Box Deconta	0	587
8-	Hot Cell/Glove Box Surveilla	0	8
Subtotal SAN, GENERAL ELECTRIC , ER		0	595
Subtotal SAN, GENERAL ELECTRIC		0	595
=SAN, LAWRENCE BERKELY LAB , CAT: CA			
2002-	AIR TOXICS FACILITY ASSESSME	1,981	3,975
2005-	REPLACE DEIONIZATION COLUMNS	100	0
2006-	SANITARY SEWER MONITORING SY	0	505
2007-	B77 WASTEWATER TREATMENT UNI	0	0
2008-	REPLACE, MONITOR, OR REMOVE	0	0
2011-	REPLACE, MONITOR, OR REMOVE	0	500
Subtotal SAN, LAWRENCE BERKELY L, CA		2,081	4,980
=SAN, LAWRENCE BERKELY LAB , CAT: ER			
2004-A	SEWER PIPE ASSESSMENT	136	0
2012-A	ENV MONITORING FACILITIES -	4,249	1,471
2012-B	ENV MONITORING FACILITIES -	0	0
2013-	NATIONAL TRITIUM LAB FAC D &	0	0
2015-	WASTE HANDLING FACILITY CLOS	68	88
Subtotal SAN, LAWRENCE BERKELY L, ER		4,453	1,559
=SAN, LAWRENCE BERKELY LAB , CAT: WM			
2001-	HAZARDOUS WASTE HANDLING FAC	0	1,582
2004-B	SEWER RESTORATION, AND IMPRO	0	0
2016-	WM BASE DISPOSAL	206	308
2017-A	WASTE MINIMIZATION - PLANNIN	220	0

ADS No.	Activity Title	FY91B	FY92R
2017-B	WASTE MINIMIZATION - IMPLEME	0	440
2018-	WM BASE CONTINUITY OF OPERAT	1,569	1,705
Subtotal SAN, LAWRENCE BERKELY L, WM		1,995	4,035
Subtotal SAN, LAWRENCE BERKELY L		8,529	10,574
=SAN, LAWRENCE LIVERMORE NATIONAL LAB , CAT: CA			
1000-	Maint. of Compliance thru Se	100	1,540
1001-	Effluent Monitoring Complian	0	1,930
1002-	Compliance Stack Monitoring	0	5,035
1004-	Permiting and Relocation of	0	100
1005-	ES&H Improvements	155	4,000
1006-	LLNL Sewer Pipe Rehabilitati	0	5,350
1007-	LLNL Site-Wide EIS	0	1,000
Subtotal SAN, LAWRENCE LIVERMORE, CA		255	18,955
=SAN, LAWRENCE LIVERMORE NATIONAL LAB , CAT: ER			
1200-	LLNL Site Ground Water Proje	3,800	4,900
1201-	LLNL Site Ground Water Proje	7,450	13,400
1202-	Site 300 Environmental Resto	4,270	750
1203-	Site 300 Environmental Resto	3,050	9,300
1204-	D&D Assessment	892	2,000
1205-	D&D Cleanup	0	6,500
Subtotal SAN, LAWRENCE LIVERMORE, ER		19,462	36,850
=SAN, LAWRENCE LIVERMORE NATIONAL LAB , CAT: WM			
1400-	PCB Replacement and Removal	0	700
1401-	Site 300 Sanitary Sewer Pond	0	250
1402-	Continuity of Operations	4,176	10,300
1403-	Treatment	1,960	2,900
1404-	Storage	1,408	8,500
1405-	Disposal	2,820	5,680
1406-A	Waste Minimization-PLANNING	740	1,500
1406-B	Waste Minimization-IMPLEMENT	100	1,490
1407-	Decontamination and Waste Tr	0	5,060
1408-	Capital Equipment	775	2,010
1409-	General Plant Project/Storag	615	600
1410-	Sewage Treatment and Water R	0	600
1411-	Mixed Waste Treatment Facili	0	990
Subtotal SAN, LAWRENCE LIVERMORE, WM		12,594	40,580
Subtotal SAN, LAWRENCE LIVERMORE		32,311	96,385
=SAN, SANTA SUSANA FIELD LAB , CAT: CA			
4000-AA	SCTI Waste Water Disposal Sy	2,861	0
4002-AA	Secondary Containment	64	0
4007-AA	Corrective Actions at Permit	180	25
Subtotal SAN, SANTA SUSANA FIELD, CA		3,105	25

ACTIVITY DATA SHEETS
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ADS No.	Activity Title	FY91B	FY92R
=SAN, SANTA SUSANA FIELD LAB , CAT: ER			
4003-AA	Bldg. 059 D&D	1,915	2,294
4004-AA	Bldg. 024 Surveillance & Mai	25	15
4005-AA	RMDF Surveillance & Maintena	216	226
4005-AB	RMDF Assessments	0	0
4005-AC	RMDF D&D	0	733
4006-AA	SSFL Work Areas Surveillance	55	15
4006-AB	SSFL Work Area Assessments	195	0
4006-AC	SSFL Work Area Decontaminati	1,448	0
4009-AA	SSFL Groundwater Assessments	155	155
4009-AB	SSFL Groundwater Cleanup	0	357
4013-AA	Environmental Monitoring	0	25
4014-AA	Environmental Management and	0	203
5000-AA	Sodium Disposal Facility Ass	0	0
5000-AB	Sodium Disposal Facility Cle	302	3,102
5001-AA	Bldg. 005 Assessments	0	52
5001-AB	Bldg. 005 D&D	0	344
5001-AC	Bldg 005 Surveillance and Ma	20	20
5002-AA	Bldg. 023 Surveillance and M	0	10
5002-AB	Bldg 023 Assessments	0	30
5002-AC	Bldg. 023 D&D	0	0
5003-AA	D&D of Rockwell Internationa	0	4,249
Subtotal SAN, SANTA SUSANA FIELD, ER		4,331	11,830
=SAN, SANTA SUSANA FIELD LAB , CAT: WM			
4008-AA	Disposal of Cold Traps	566	205
4010-AA	Disposal of Alkali Metal	0	495
4011-AA	Disposal of Surplus Sodium	0	0
5005-AA	Disposal of TRU Waste	36	26
Subtotal SAN, SANTA SUSANA FIELD, WM		602	726
Subtotal SAN, SANTA SUSANA FIELD		8,038	12,581
=SAN, STANFORD LINEAR ACCELERATOR CENTER , CAT: CA			
3004-AA	Remodel Plating Shop	0	0
Subtotal SAN, STANFORD LINEAR AC, CA		0	0
=SAN, STANFORD LINEAR ACCELERATOR CENTER , CAT: ER			
3006-AA	Groundwater Assessment Plan	0	0
Subtotal SAN, STANFORD LINEAR AC, ER		0	0
=SAN, STANFORD LINEAR ACCELERATOR CENTER , CAT: WM			
3007-AA	Radioactive Material Disposa	0	0
3008-AA	Waste Disposal Program	250	264
3009-AA	Waste Minimization Program	75	84
3010-AA	Ozonation of Cooling Towers	0	120
3012-AA	Air Toxics Inventory	0	0
3013-AA	Oil/Water Separator Upgrade	0	0
3014-AA	Waste Water Treatment Facili	0	40
3015-AA	Disposal of PCB's - Substati	0	62
Subtotal SAN, STANFORD LINEAR AC, WM		325	570

ADS No.	Activity Title	FY91B	FY92R
Subtotal SAN, STANFORD LINEAR AC		325	570
=SAN, UNIVERSITY OF CALIFORNIA AT DAVIS , CAT: ER			
1-AA	Environmental Restoration As	300	300
2-AA	Environmental Restoration Cl	402	7,200
Subtotal SAN, UNIVERSITY OF CALI, ER		702	7,500
Subtotal SAN, UNIVERSITY OF CALI		702	7,500
Subtotal SAN		50,605	137,783
=SR, SAVANNAH RIVER SITE , CAT: CA			
115-AA	POWER Install Settling Basin	1,000	0
127-AA	POWER Boiler Blowdown Discha	1,000	0
236-AA	Reactor Effluent Cooling The	44,600	17,600
Subtotal SR , SAVANNAH RIVER SIT, CA		46,600	17,600
=SR, SAVANNAH RIVER SITE , CAT: ER			
3-AX	Waste Transfer Program Cost	0	0
301-AA	M-Area Settling Basin/Lost L	0	0
302-AA	A/M - Area Groundwater Remed	2,550	3,200
303-AA	Met Lab Basin Closure	2,500	200
304-AA	Acid/Caustic Basin Closure	1,000	400
305-AA	Mixed Waste Management Facil	6,000	0
306-AA	RCRA/CERCLA Investigations	9,519	14,095
307-AA	ER Program Support	4,615	5,025
309-AA	SRL Seepage Basins Closure	1,600	600
310-AA	New TNX Seepage Basin Closur	2,000	450
314-AA	Underground Storage Tanks	700	600
316-AA	F/H Seepage Basin Closure	11,600	4,250
319-AA	RFI Program Waste Unit Closu	0	0
320-AA	Bingham Pump Outage Pits Rem	0	0
326-AA	SRL D & D Decommission SRL S	0	1,326
327-AA	SRL D & D Decommissioning SR	0	1,595
328-AA	SRL D & D Decommissioning th	0	679
329-AA	D & D of HWCTR (Surveillanc	110	250
330-AA	SEP D & D of old HB-Line	2,500	2,500
331-AA	D & D R Reactor Support Faci	0	9,000
332-AA	Inactive Reactor Seepage Bas	0	0
339-AA	Geotechnical Data Base Mana	0	400
342-AA	CERCLA Remediations	0	0
345-AA	Decontamination and Decommis	0	0
349-AA	POWER D & D 284-D Powerhouse	0	0
350-AA	REACTORS D & D 412-D Heavy W	0	0
351-AA	Burial Ground (MWMF) Groundw	800	850
352-AA	D & D and Removal of Buildli	0	350
353-AA	D & D and removal of Buildin	0	363
354-AA	D & D and Removal, Building	0	0
355-AA	Decontamination andDecommiss	0	0
408-AA	Waste Transfer	10,500	10,200
409-AA	Separations - D&D - Tritium	0	3,000

(dollars in thousands)

ADS No.	Activity Title	FY91B	FY92R
443-AA	Regulatory Geotechnical Supp	2,200	2,400
451-AA	SRL Operate Air Stripper Col	133	144
465-AA	SRL ESS/SREL Reforestation o	0	350
469-AA	TNX Groundwater Remediation	300	600
470-AA	F/H-Area Groundwater Remedia	1,800	19,530
478-AA	State Reimbursement for FFA	2,000	2,000
Subtotal SR , SAVANNAH RIVER SIT, ER		62,427	84,357
=SR, SAVANNAH RIVER SITE , CAT: WM			
1-AA	H-Area General	18,149	20,768
1-AB	High Level Waste Storage (HL	24,056	25,466
1-AD	Effluent Treatment Facility	1,618	1,732
1-AE	Burial Ground - Area General	3,329	3,598
1-AF	Environmental Support	1,250	636
1-AH	F-Area General	10,284	10,978
1-AI	High Level Waste (HLW) Stora	14,778	14,841
1-AX	Continuity of Operations	0	0
1-CA	Effluent Treatment Facility	500	500
1-CB	Tank Farm Operations	6,500	5,950
1-GA	Effluent Treatment Facility	634	500
1-GB	Tank Farm Operations	7,000	3,090
2-AA	Evaporation-H-Area	13,988	15,027
2-AB	Replacement High Level Waste	0	4,163
2-AL	Evaporation - F Area	6,521	7,316
2-LA	Replacement High Level Waste	11,330	24,000
3-AA	Waste Transfer Program - H-A	4,791	2,840
3-AB	Waste Transfer Program - F A	1,759	2,355
5-AA	Salt Removal - H-Area	11,130	15,590
5-AB	Salt Removal - F Area	10,999	12,323
8-AX	Agitation	0	0
9-AA	In-Tank Precipitation/ Exten	33,472	25,728
12-AA	New Waste Transfer Facilitie	6,343	12,557
12-LA	New Waste Transfer Facilitie	0	0
13-AA	Mixed Waste Storage	688	227
15-AA	Burial Ground Expansion Faci	0	16,919
15-CA	Burial Ground Expansion Faci	0	800
15-LA	Burial Ground Expansion	0	7,700
15-LB	Burial Ground Expansion - I	0	0
15-LC	Burial Ground Expansion - I	0	0
16-AA	Low-Level Waste Disposal	6,511	8,323
17-AA	Effluent Treatment Facility(	25,516	22,091
18-AA	Hazardous Waste Storage	3,594	4,739
19-AA	Consolidated Incineration Fa	0	16,309
20-AA	Transuranic (TRU) Waste Faci	0	1,827
20-CA	Transuranic Waste Facility	0	0
21-AA	Waste Preparation Facility S	0	1,056
22-AA	Transuranic (TRU) Waste Cert	2,078	1,796
22-AB	Transuranic (TRU) Waste Stor	2,078	1,796
25-AA	Hazardous Low Level Waste (L	0	1,795
25-LA	Hazardous Low-Level Waste Pr	5,800	10,100
26-AA	Storm Water System Upgrade-D	0	100
26-LA	Storm Water System Upgrade	0	0
27-AA	High Level Waste Removal Fro	0	50
27-LA	High Level Waste Removal Fro	0	20,470
27-LB	HIGH LEVEL WASTE FROM FILLED	0	0
28-AA	Inter-Area Line Upgrade - De	0	50
28-LA	Inter-Area Line Upgrade	0	3,300
29-AA	Tank Farm Services - Upgrade	0	100
29-LA	Tank Farm Services - Upgrade	0	0
30-LA	Effluent Treatment Facility	0	0
32-AA	DOE-SR Program Direction	2,200	6,850
33-AA	DOE - Headquarters Managemen	22,000	22,000
34-AA	DOE - SR Interim Waste Mana	8,324	12,877
35-AA	SRL ITP/ESP (DWPF Feed Prep/	1,600	1,400
36-AA	RX Waste Handling	932	1,440
37-AA	RM Effluent Toxicity Reducti	500	50
38-AA	RM Waste Slurry Treatment Fi	0	100
40-AA	SEP Low-Level and Intermedia	5,047	5,552
41-AA	SEP TRU Waste Handling	1,165	1,282
43-AA	SRL Waste Qualification	6,600	5,500
44-AA	SRL Defense Waste Process Fa	16,201	20,060
45-AA	SRL HLW Evaporation Support	200	0
46-AA	SRL HLW Storage Support	2,000	1,500
47-AA	SRL Low-Level Waste Storage/	1,400	1,530
48-AA	SRL Metallurgical Support	125	130
50-AA	SRL Performance Improvements	2,000	1,500
51-AA	SRL HLW Process Development	1,600	1,300
52-AA	SRL Production Monitoring Su	150	120
54-AA	SRL Replace/Upgrade 776-A Wa	0	42
55-AA	SRL Safety & Continuity	2,450	5,000
56-AA	SRL Salt Removal-New Tanks O	800	900
57-AA	SRL Stress Analysis Support	55	60
58-AA	SRL Tank Farms Remote Equipm	150	200
60-AA	SRL TRU Waste Compliance Act	300	500
62-AA	SRL Waste Management Operati	570	792
64-AA	SRL Waste Transfer and Tank	400	0
66-AA	Tritium Waste Disposal	262	262
68-CA	Consolidated Incineration Fa	0	0
68-LA	Non-Radoactive Hazardous Was	5,000	19,500
69-LA	Transuranic (TRU) Waste Faci	15,300	20,950
70-AA	Hazardous Waste/Mixed Waste	0	1,794
70-CA	Hazardous Waste/Mixed Waste	0	0
70-LA	Hazardous Waste/Mixed Waste	7,600	18,600
71-AA	SEP Waste Handling Facility,	0	0
71-LA	Haz. Waste/Mixed Waste Dispo	0	0
73-LA	Diversion Box/Pump Pit Conta	0	6,840
81-AA	SRL Consolidated Incineratio	0	36
84-AA	SEP Upgrade TRU Waste Manage	500	500
87-AA	221-F Line Low-Level Box Was	0	160
99-AA	SRL Active Lysimeters	150	150
135-AA	POWER Upgrade Softener Build	660	0
136-AA	POWER Upgrade Softener & Spi	440	0
141-AA	RM New Degreaser System	0	0
144-AA	RM Replace Process Sewer Lin	0	500
145-AA	RM Upgrade Storm Sewer	0	0
146-AA	RM Wastewater Feed Improveme	0	0
163-AA	SEP Improved Waste Handling,	0	1,860
168-AA	SEP Upgrade Railroad Tunnel	600	600
170-AA	SEP Upgrade Drainage System,	0	0
171-AA	SEP Upgrade Transport & Stor	100	0
178-AA	SRL Chemical Storage Expansi	0	0
184-AA	SRL Effluent Treatment Facil	750	900
187-AA	SRL ETF Chemical Studies	750	800

APPENDIX A

ACTIVITY DATA SHEETS
SORTED BY OPERATIONS OFFICE, INSTALLATION, AND CATEGORY
(dollars in thousands)

ADS No.	Activity Title	FY91B	FY92R
189-AA	SRL F/H Effluent Treatment F	1,250	1,400
200-AA	SRL Laboratory Process Sewer	0	0
203-AA	SRL Sanitary Sewer Upgrade,	0	300
209-AA	SRL TNX Support for ETF	750	800
212-AA	Groundwater Monitoring	1,254	736
215-AA	New Sanitary Landfill - Desi	750	100
215-CA	New Sanitary Landfill	0	0
215-LA	New Sanitary Landfill	0	0
217-LA	Waste Preparation Facility	0	0
237-AA	SRL Effluent Treatment Expan	0	0
242-AA	SRL Process Sewer Upgrade	0	0
411-AA	POWER Sanitary Sludge Land R	0	100
417-AA	CSWE Manage Hazardous Waste	0	60
436-AA	Replace Shielded Storage Exh	0	0
440-AA	SRL Replace 735-A Low Activi	0	0
442-AA	SRL Z Area Saltstone	800	800
449-AA	SRL Prepare Part B Permit	0	0
464-AA	SRL ESS/SREL Heavy Metal Tox	0	420
475-AA	SRL Pressurize 904-A Trench	100	100
476-AA	Power Environmental Protecti	0	0
481-AA	Evaporator Containment - Des	0	75
481-LA	Evaporator Containment	0	0
482-AA	Sanitary Landfill Operations	1,229	1,562
483-AA	Waste Minimization	360	720
483-AB	H-Area Compactor Operations	621	936
484-AA	Additional Waste Tank Coolin	0	100
484-AB	Waste Management Interim Fir	0	10,000
484-LA	Additional Waste Tank Coolin	0	0
484-LB	Waste Management Interim Fir	0	0
501-AA	Vitrification Pre-op/Operati	4,810	2,658
501-AB	Defense Waste Processing Fac	0	70,000
502-AA	Vitrification Pre-op/Operati	8,372	12,914
502-AB	Vitrification Preop/Operatio	9,635	7,280
503-AA	Vitrification Pre-op/Operati	8,408	14,033
504-AA	Vitrification Pre-Op/Operati	5,077	5,095
504-AC	Vitrification Pre-Operations	800	1,400
505-AA	Vitrification Pre-Op/Operati	7,121	9,770
505-AB	Vitrification Pre-Op/Operati	1,480	304
506-AA	Vitrification Pre-op/Operati	8,391	7,630
506-AB	Vitrification Pre-Op/Operati	1,380	280
507-AA	Vitrification Pre-Op/Operati	14,630	19,622
507-AB	Vitrification Pre-Op/Operati	280	280
507-AC	Vitrification Pre-op/Operati	4,474	1,000
507-AD	Vitrification Pre-Op/Operati	0	0
508-AA	Vitrification Pre-op Operati	21,320	22,145
508-AB	Vitrification Pre-op Operati	5,930	280
511-AA	Vitrification Pre-Op/Operati	2,959	2,848
512-AA	Vitrification Pre-Op/Operati	9,906	10,000
513-AA	Glass Waste Storage Building	815	886
513-AB	Glass Waste Storage Building	0	0
513-AC	Failed Equipment Storage Vau	0	0
514-AA	SRS Project Support	0	0
515-AA	Environmental/Waste Complian	970	1,088
519-AA	Saltstone Operations (Huma	597	645
520-AA	Saltstone Pre-Op/ Operations	9,315	19,900
520-AB	Saltstone Operations	400	400
520-AC	Saltstone Operations	400	400

ADS No.	Activity Title	FY91B	FY92R
521-AA	Saltstone Pre-Op/Operations	709	758
521-AB	Saltstone Operations (Facil	100	100
521-AC	Saltstone Operations (Facil	100	100
522-AA	Alternative Disposal of Benz	0	0
523-AA	M-Area Waste Disposal (Y-Are	9,725	7,850
524-AA	Vitrification Pre-op/Operati	1,419	1,457
524-AB	Vitrification Pre-op/Operati	100	100
525-AA	Saltstone Pre-Op/Operations	58	63
527-AA	SRL Mercury Disposal	150	150
528-AA	SRL Improved Automation of D	0	225
529-AA	SRL Replace Section 'E' Proc	0	360
530-AA	TNX Support for HLW Activiti	750	800
533-AA	SRL TRU Waste Processing Tec	2,000	2,200
535-AA	Waste Management Quality Sup	3,089	3,347
536-AA	Nuclear Materials Processing	5,700	6,600
538-AA	SRL - IWT Productivity Impro	600	800
539-AA	Solid Waste Chargeback Syste	-26,426	-27,948
550-LA	Improved Transfer Lines	0	0
567-AA	New Electrolytic Dissolver f	0	500
1000-AX	Continuity of Operations (Pe	0	0
Subtotal SR , SAVANNAH RIVER SIT, WM		476,235	720,172
Subtotal SR , SAVANNAH RIVER SIT		585,262	822,129
Subtotal SR		585,262	822,129
= CAT: TD			
0-	TECHNOLOGY DEVELOPMENT	206,000	280,301
Subtotal TD		206,000	280,301
Grand Total		3,083,059	5,966,924

APPENDIX B

STATUS OF COMMITMENTS MADE IN FY 1991-1995 FIVE-YEAR PLAN AND DRAFT APPLIED RESEARCH, DEVELOPMENT, DEMONSTRATION, TESTING, AND EVALUATION PLAN

Appendix B lists all of the commitments made in the FY 1991-1995 Five-Year Plan for Environmental Restoration and Waste Management and the Draft Applied Research, Development, Demonstration, Testing and Evaluation (RDDT&E) Plan, except for milestones, which are given in Attachments A-D. The status of commitments appears in bold type. Pages referenced are where the commitments were mentioned in the Plans. Sections referenced in the status statements are where the commitment is discussed in the FY 1992-1996 Five-Year Plan. The status of major commitments made was summarized in Section 1.12 of the FY 1992-1996 Five-Year Plan.

FIVE-YEAR PLAN FOR ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT, FY 1991-1995

FOREWORD AND EXECUTIVE SUMMARY

1. DOE is committed to the goal of cleanup of all its sites within 30 years. (pp. ix, 2, 4)

   DOE remains committed to this goal. Counting from the first Five-Year Plan, this goal is set for the year 2019. In the revisions of the Five-Year Plan, the goal may be stated as "before the year 2020." See Section 1.5.

2. In September 1989, the Department will hold a multi-agency workshop, including EPA and affected States and Indian Nations, to help develop prioritization criteria. The resulting prioritization system will be based on scientific principles and risk reduction in terms that are understandable to the public. (pp. xi, 2, 4, 12)

   The meeting was held in October 1989. Two additional meetings have also been held, and prioritization criteria development remains in progress. See Section 1.10.

3. DOE is committed to its goal of protecting human health and safety and the environment as well as to its policy of full compliance with the letter and spirit of all applicable environmental statutes and regulations. (pp. xii, 2, 4)

   DOE remains committed to this goal.

4. The Department Program Offices and Operations will have full authority and accountability for implementing the programs and for performing the tasks outlined in this Plan. This includes development by the Operations Offices of five-year implementation plans and participation in and review of the plans by affected regional parties. (pp. xii, 3, 7, 10, 12)

   The major steps toward meeting this commitment have been accomplished. There has been a reorganization at the Headquarters level to clearly define program responsibilities and authorities (See Section 1.6). Operations Offices have completed their first five-year implementation plans. See Section 1.10.

5. The Office of Environment, Safety, and Health will maintain independent audit and appraisal programs that assess compliance with all applicable environmental, safety, health, and quality assurance laws, ordinances, regulations, requirements, policies, and standards. (p. xii)

   DOE continues to function this way.

6. DOE will continue to solicit views from outside scientific, political, and citizen organizations to ensure that the groups have the opportunity to address their concerns and to work with the Department to achieve priorities that are fair, effective, and timely. (pp. xiii, 12)

   The breadth of involvement by outside organizations continues to be expanded. See Section 1.15.1.

7. The Plan will be revised annually, with a five-year planning horizon. (pp. 1, 9)

   DOE remains committed to an annual five-year plan revision. This document is the first update.

8. The DOE epidemiological program will also be restructured, including the creation of a comprehensive epidemiological data repository. This repository will enable scientists not affiliated with DOE to have access to DOE worker data to conduct independent studies on the worker population. (pp. 3, 4)

   DOE is moving aggressively to implement these commitments. The Secretarial Panel for the Evaluation of Epidemiological Research Activities (SPEERA) was appointed in August 1989. Chaired by the Secretary of Health of the State of Washington, this eminent professional group was charged with evaluating DOE's epidemiologic activities. In addition, the National Academy of Sciences is assisting DOE in developing mechanisms for access to data by non-DOE researchers. The first step was taken with the publication in the Federal Register (November 17, 1989) of proposed new rules for accessing records of contractor employees for conducting epidemiological studies. An interim data base covering approximately 70,000 workers was made available early in 1990. Finally, long-term epidemiological research has been assigned to the Department of Health and Human Sciences.

9. DOE will contain known contamination at inactive sites and vigorously assess the uncertain nature and extent of contamination at other sites to enable realistic planning, scheduling, and budgeting for cleanup. (p. 4)

DOE is aggressively pursuing its Environmental Remediation Program, which (1) identifies waste sites that potentially need remediation, (2) assesses sites according to potential hazard and immediacy of need for response, (3) plans for an appropriate remediation and budget, and (4) carries out the remediation. See Section 3.0.

10. DOE will support the establishment of interagency agreements and fulfill the requirements of compliance agreements already in place. (p. 4)

    These commitments remain.

11. DOE will conduct public health risk assessments of plant sites for past, present, and future operations. (p. 4)

    Both near-term and longer-term assessments of risks are being done for past, present, and future operations at DOE sites. The near-term assessments are to support the development of the FY 1992 budget and use a qualitative hazard index for ranking sites. Longer-term assessments will employ the quantitative ranking methodology now under development.

12. DOE will implement programs to minimize current waste generation and future waste disposal requirements. (pp. 4, 7)

    DOE prepared a draft agencywide Program Plan for waste minimization. Each Operations Office is preparing site waste minimization implementation plans due May 1990.

13. DOE will establish an Applied R&D program involving university research capabilities, industry, national laboratories, and other Federal agencies to determine and rank R&D needs and pursue new and improved technologies for waste minimization and cleanup. This will include the establishment of regional university consortia. (pp. 4, 18, 27, 30)

    The Applied R&D program was an integral part of the recently accomplished DOE reorganization. See Sections 1.6 and 5.0.

14. DOE will change its culture to one of clear and open communication. DOE must listen to its critics and not contend that all is well or that the Department knows all the answers. This includes proactive outreach to involve all interested persons and institutions. (pp. 4, 6, 7, 9)

    DOE remains committed to this goal. Although much progress has been made, the task is not complete. See Sections 1.14 and 1.15

15. DOE will work diligently to achieve congressional support for the Plan's objectives. (p. 4)

    DOE management continues to work with Congress on the Plan's goals.

16. DOE will recognize Tribal sovereignty and treaty rights related to Tribal and ceded lands. (p. 4)

    Tribal representation on the State and Tribal Government Working Group (STGWG) is being expanded, at the request of interested Tribal governments.

17. DOE will continually examine environmental regulations to ensure that its compliance actions effectively reduce risk to human health and the environment. (p. 4)

    Environmental laws and regulations are continually reviewed by the Office of the Assistant Secretary for Environment, Safety, and Health (EH).

18. Management and follow-up of the activities described in the Plan will require establishment of an integrated Environmental Restoration and Waste Management organization within DOE Headquarters. The Secretary of Energy will announce and implement the new organization later this year. (p. 22)

    The new organization has been announced and implemented. See Section 1.6.

19. To achieve its vision for this program, DOE must compare internal and external human resource needs (number and skill mix) against the current resource base and take innovative steps to develop, motivate, and allocate needed resources. In FY 1990, DOE plans to (1) define the problem (i.e., determine future employment and skill mix requirements for the agency and its contractors) and (2) implement new and enhanced educational support programs focused on these requirements. New educational programs will be implemented with appropriate attention given to minority educational institutions and their faculties and students. (pp. 4, 26, 27)

    A study to evaluate resources and future needs is under way at The University of Tennessee. DOE is a major sponsor of the study, along with other organizations for which the information is critical. Educational initiatives will be announced during the current fiscal year.

CORRECTIVE ACTIVITIES

1. DOE is committed to achieving and maintaining compliance with applicable local, State, and Federal requirements, as well as with internal DOE requirements. (p. 38)

   DOE remains committed to this goal.

2. The primary goal of Corrective Activities is to implement the necessary actions on an aggressive basis to eliminate out-of-compliance conditions. (p. 38)

   DOE continues to function this way.

3. All activities described in this section of the Plan will be completed to achieve the stated goal of regulatory compliance. (p. 38)

The major steps toward meeting this commitment have been accomplished. Over 140 Activity Data Sheets (ADSs) are funded in the updated Plan for the Corrective Activities area. Most of these activities will be completed in the 1994-1995 time frame.

4. As an indication of DOE's commitment to full compliance with requirements, the Plan provides for completing funding for:
   - 60 percent of the total Corrective Activities ADSs identified in this Plan by FY 1990.
   - 75 percent of the total Corrective Activities ADSs identified in this Plan by FY 1991.
   - 88 percent of the total Corrective Activities ADSs identified in this Plan by FY 1994. (p. 38)

   DOE remains committed to this goal. At the present time, over 75 percent of the identified Corrective Activities ADSs are funded in FY 1990.

5. In coordination with regulatory agencies, DOE will develop plans, select appropriate technologies, and implement schedules for completing the identified Corrective Activities. In addition, the Corrective Activities process will provide appropriate opportunities for regulator involvement and review. (p. 38)

   DOE continues to function this way.

6. Funding requirements for Corrective Activities will be included in annual updates of this Plan and submitted as part of the annual DOE budget process. Upon receipt of funding, the Corrective Activities are implemented. If sufficient funding is not provided by Congress, DOE will request additional funding and initiate discussions with regulators to evaluate possible alternative approaches. (p. 43)

   DOE has just updated the Plan and will continue to update the Plan annually. Funding requirements for Corrective Activities are included as part of the Plan and are submitted in the annual DOE budget process. The Corrective Activities are implemented after receipt of the funding.

7. At various times in the process, opportunities are provided for review by regulatory agencies, Indian Tribes, and interested citizens. Public review processes, identified in environmental regulations, will be followed. (p. 43)

   DOE remains committed to the public review process. The current Plan update included public review by STGWG, and many of the ongoing compliance activities involve public review and comment mandated by environmental statutes and EPA regulations.

8. Progress on completion of Corrective Activities will be documented in the annual Plan update. (p. 43)

   This is still correct. This document is the first annual update of the Plan.

9. Solid waste activities include the construction of a new sanitary landfill at the Idaho National Engineering Laboratory (INEL). This landfill is for Idaho Site use only. Under this activity, the landfill will be constructed in accordance with proposed RCRA Subtitle D regulations pertaining to solid waste disposal facilities (which address requirements for liners, leachate collection systems, groundwater monitoring, etc.). (p. 72)

   Construction of the new sanitary landfill at INEL is scheduled to start in the first quarter of FY 1991 and will be completed by the fourth quarter of FY 1992.

10. At the Nevada Test Site, a Priority 4 Solid Waste Corrective Activity will provide for controlled access and fencing of active landfills, as well as emplacement of surveyed markers along boundaries of some inactive landfills. (p. 72)

    Landfill access controls are currently being implemented; installation will be completed by the fourth quarter of FY 1992.

11. The other Priority 4 activity deals with the installation of liquid effluent monitoring systems that are needed for compliance with DOE Orders relative to certain Hanford Site buildings. (p. 72)

    At the present time, no funds have been allocated to initiate this project; however, it is planned that this project will start as soon as funding becomes available.

12. DOE is committed to bringing out-of-compliance active and standby facilities into compliance with local, State, and Federal requirements in the shortest practical time. (p. 77)

    DOE remains committed to this goal. Funding has been allocated for most of the Corrective Activities, and substantial progress is being made.

13. A large percentage of Corrective Activities should be completed by the mid-1990s, and DOE should be nearing full compliance with applicable current requirements. (p. 77)

    As stated in the 1989 Five-Year Plan, DOE intends to have over 88 percent of the Corrective Activities ADSs funded by 1994. In the 1990 Five-Year Plan, DOE intends to ensure full compliance in an even more aggressive time frame and has assigned a Priority 1 funding level to all Corrective Activities. This will ensure that all Corrective Activities will be completed in the shortest time possible. Some projects will take longer than others because of the nature of the work. DOE adheres to a Federal Facility Compliance strategy for these longer projects with emphasis on negotiated schedules with the regulators. It is anticipated that, after the 1993-1994 time frame, DOE will be in compliance with all existing regulations, and the

Corrective Activities will come only from new or changed regulations.

ENVIRONMENTAL RESTORATION

ALBUQUERQUE OPERATIONS OFFICE

All commitments are addressed in the Operations Office Overviews and Installation summaries with the following exceptions.

LOS ALAMOS NATIONAL LABORATORY

1. Scoping and reconnaissance studies are under way at 37 of 55 potential release site tasks.

   There are now 57 release site. Of the 37 studies started, 33 are complete and four are under way.

2. D&D is in progress on three reactors and is scheduled for completion at the end of FY 1990.

   The revised milestone is the complete D&D on four reactors.

3. Complete D&D of two facilities in FY 1990.

   The revised milestone is to complete four tasks in 1990.

PANTEX

4. Complete assessments on one task in FY 1990.

   This milestone is delayed. Four RFI Work Plans will be completed in FY 1990, and one RFI Report will be completed in FY 1991.

5. Prepare Program Plan (FY 1990).

   Preparation of a program plan for D&D for facilities in the Albuquerque Operations Office remains unfunded in FY 1990. This milestone was not carried over due to this funding problem.

SANDIA NATIONAL LABORATORIES - ALBUQUERQUE

6. RI plan completed in 1988 for one SNLA task; RI to be initiated in FY 1989 and completed in FY 1990.

   Status remains correct.

7. "Nonorphan" survey identified reactor at SNLA for D&D; program plan to be prepared in FY 1990.

   Program plan has not been funded due to D&D funding constraints. This will be delayed to an unknown date.

8. Start assessments for five Technical Areas (FY 1990).

   Milestone was deleted due to "start" language not meeting current definition of an appropriate milestone.

SANDIA NATIONAL LABORATORIES - LIVERMORE

9. The RI Plan, RI Report, and Compliance Monitoring Plan for the Trudell Auto Repair Ship were completed by the end of FY 1988; Stage 2 of the RI Plan has been published, and field investigation is under way.

   Status statement is correct. The assessment phase was completed in FY 1989. Additional status information is located in the Installation Summary.

10. The Solid Waste Assessment Test (SWAT) proposal for the Navy Landfill was submitted to the State of California for review.

    This status remains correct.

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT

11. Key UMTRA activities planned include completion of nine sites by the end of FY 1990.

    The current plan is to complete only eights sites through 1990 (CAN, ALC, SHP, RVT, TUB, LKV, GRN, and SPK). Durango was previously scheduled to be completed in FY 1990; however, it is now scheduled for completion at the end of the first quarter in FY 1991.

12. Thirteen sites under construction during FY 1989.

    Two sites (SPK and SLC) were completed, eight sites (DUR, GRJ, GRN, HAT, LKV, MON, RVT, and TUB) are to be completed in or ongoing through FY 1990, and three sites (two RFL sites and AMB) are scheduled to restart in FY 1991.

13. Complete all NEPA documentation (FY 1990).

    This activity was moved into FY 1991 from FY 1990 based on increased requirements at four sites (FCT, GUN, NAT, and SRK).

14. Complete RA at 660 vicinity properties; start two sites, complete four sites, and have nine sites under construction (FY 1990).

    Remediation completion was increased to 721 properties. In addition, the revised milestone is to have eight sites under construction by the end of FY 1990 and complete remedial action at four sites (GRN, LKV, RVT, and TUB). Remedial action at two sites (FCT and GUN) was rescheduled to start in FY 1991 due to additional assessment required to meet revised EPA groundwater standards.

PINELLAS PLANT

15. Complete cleanup for one task in 1990.

    Cleanup has started on the 4.5-acre site, but will not

be completed until FY 1977. Cleanup of SWMUs is projected to be complete in FY 1996.

CHICAGO OPERATIONS OFFICE

All commitments are addressed in the Operations Office Overviews and Installation summaries.

IDAHO OPERATIONS OFFICE

All commitments are addressed in the Operations Office Overviews and Installation summaries.

NEVADA OPERATIONS OFFICE

All commitments are addressed in the Operations Office Overviews and Installation summaries.

OAK RIDGE OPERATIONS OFFICE

All commitments are addressed in the Operations Office Overviews and Installation Summaries, with the following exceptions.

FEED MATERIALS PRODUCTION CENTER

16. A sitewide environmental assessment was initiated in 1986 to formulate, assess, and recommend RA alternatives to mitigate identified environmental concerns. To provide the needed focus on high-priority environmental concerns, six operable units were identified:
    - Waste storage area, including six waste pits, burnpit, and clearwell;
    - Solid waste units, including the sanitary landfill, lime sludge ponds, and fly ash piles;
    - Facilities and Suspect Area;
    - Special facilities, including K-65 silos and Silo No. 3;
    - Environmental media, including surface soil, sediments, and regional groundwater and South Plume.

    This status is correct, but it should have read five operable units rather than six.

17. Cleanup of offsite surface soil and groundwater is planned.

    This status remains current. Groundwater monitoring is continuing.

18. Cleanup of contamination in buildings and equipment is under way.

    The major cleanup efforts are scheduled for FY 1991. The original commitment should have stated that planning was under way.

19. Initiate cleanup actions on offsite soils and groundwater (FY 1990).

    This milestone was deleted due to the "initiate" language not meeting the new definition of a milestone.

    Cleanup and characterization activities are in progress as noted in the FMPC site summary.

Y-12 PLANT

20. Additional closures are being conducted for RCRA non-land-based units and non-RCRA areas.

    This status is still correct.

21. Other RAs under way include:
    - Liquid storage facility for contaminated oil;
    - Storage facility for contaminated soils;
    - Surface seepage collection system; and
    - Groundwater treatment facility for oil seepage.

    These are correct, with the addition of:
    - **Kerr Hollow Quarry**
    - **Bear Creek Burial Ground**
    - **New Hope Pond**

22. Planned RAs include:
    Removal and treatment, storage, or disposal of contaminated soils from RCRA and CERCLA sites; remediation of East Fork Poplar Creek; and reduction of mercury in plant effluents.

    These are correct, with the addition of remediation of groundwater contamination.

OAK RIDGE GASEOUS DIFFUSION PLANT

23. ORGDP is now in the RFI phase of the remedial action program.

    This status remains correct.

24. The SWMUs at ORGDP have been identified, RFI plans are being prepared, and two units are under investigation.

    The ORGDP SWMUs have been identified, and historical investigations are continuing to identify additional units, if any. RFI Plans are still being prepared. Two additional Plans will be issued in FY 1990. The fieldwork for two Phase I investigations was completed in FY 1989, and two will be initiated in FY 1990.

25. Groundwater monitoring is in progress. An additional 49 wells are being installed.

    Groundwater monitoring is continuing. The installation of the 49 wells has been completed.

PADUCAH GASEOUS DIFFUSION PLANT

26. Begin development of work plan for SWMUs not included in DOE/EPA Consent Order (FY 1990).

    Deleted as a milestone due to "begin" language not meeting current definition of an acceptable milestone.

Replaced with FY 1991 milestone to complete work plans.

PORTSMOUTH GASEOUS DIFFUSION PLANT

27. Complete closure of X-749 (FY 1990).

    This milestone has been delayed to FY 1991. Closing the X-749 includes preparing a closure plan, preparing a closure option study (COS), and closing the X-749 by the method determined from the COS. The X-749 closure plan was approved on July 14, 1989; the COS was submitted to OEPA on October 8, 1989; and ORO is currently awaiting approval of the COS from OEPA before starting closure. Once the option is approved by OEPA, a work plan is requires to be submitted for OEPA approval. Upon approval of the work plan, the Ohio Consent Decree requires for X-749 to be closed in 360 days or according to the schedule approved in the work plan.

WELDON SPRING SITE

28. Remove ROD for quarry bulk waste (FY 1990).

    The original commitment should have read "complete" rather than "remove." The commitment was carried over to the new milestone list.

29. Remove draft site RI/FS-EIS (FY 1990).

    The original commitment should have read "issue" rather than "remove." The commitment was carried over to the new milestone list.

30. Begin quarry waste removal activity (FY 1990).

    This has been deleted in the new list of commitments due to the "begin" language not meeting the new definition of a commitment. A contract has been awarded for design and fabrication of a quarry water treatment plant.

FORMERLY UTILIZED SITES REMEDIAL ACTIONS PROGRAM

31. RIs are under way at three sites in Missouri, three sites in New Jersey, and five sites in New York.
    The current status is four sites in Missouri. Other States remain the same.

32. Interim RAs are under way in New Jersey, Tennessee, New York, Pennsylvania, and Missouri.

    The current status adds Oregon and Massachusetts.

OAK RIDGE NATIONAL LABORATORY

33. Initiate RI on main plant area and the hydrofracture injection sites (FY 1990).

    This was deleted as a milestone due to the "initiate" language not meeting the new definition of a milestone. Installation of hydrofracture RI has been delayed to FY 1991 due to FY 1990 funding restrictions.

RICHLAND OPERATIONS OFFICE

All commitments are addressed in the Operations Office Overviews and Installation summaries with the following exceptions.

34. Initial D&D activities currently under way include cleanup of the 183-H Solar Evaporation Basins, D&D activities on the 100 Area Ancillary Facilities (radioactive-contaminated facilities that supported operation of the reactors), and preparation of the Surplus Production Reactor Decommissioning EIS for the eight shutdown reactors. Proposed D&D activities include continuation of the foregoing activities and the start of actual D&D of the 100 Area Reactors and 100 Effluent Facilities.

    D&D activities are ongoing on the 183-H Solar Evaporation Basins, and the draft EIS for the reactors is complete. The final EIS will be complete in 1990. D&D on the 100 Area Ancillary Facilities has been deferred to 1992, and D&D activities on the surplus reactors and effluent facilities will follow the ROD projected for release in late 1990.

35. Surplus Production Reactor Decommissioning EIS-Complete final EIS/issue ROD (FY 1990).

    The draft EIS is complete with a final issue in 1990. The ROD will be issued in 1991.

ROCKY FLATS

All commitments are addressed in the Operations Office Overviews and Installation Summaries with the following exceptions.

36. Start assessments for ten tasks (FY 1990).

    This commitment has been increased to 13 tasks and carried over as an FY 1990 milestone. These tasks include: OU 4, OU 5, OU 6, OU 7, OU 8, OU 9, OU 10, other closures, Original Process Waste Line, Sanitary Landfill, Solar Ponds, West Spray Field, and Oxnard Facility.

37. Complete background characterization program (May 1990).

    This was deleted as a milestone. The background characterization program is actually an ongoing program that will not be completed until FY 2007. The FY 1990 milestone referred to completion of annual background characterization soil and water reports, although this was not clear from the wording. Completion of these is expected in May 1990, but because it is not a major issue, it was deleted as a milestone.

38. Start cleanup for two sites (FY 1990).

The new milestone is to begin remediation for three tasks in FY 1990, an increase of one task since last year. The Oxnard Facility task has been added to the other two tasks, which are the Sanitary Landfill and Solar Ponds.

SAVANNAH RIVER OPERATIONS

All commitments are addressed in the Operations Office Overviews and Installation summaries.

SAN FRANCISCO OPERATIONS

All commitments are addressed in the Operations Office Overviews and Installation summaries with the following exceptions.

39. At LLNL, the soil/groundwater assessment, the Site 300 assessment and cleanup, and the Surveillance and Maintenance (S&M) of surplus facilities are under way. (Status section from Installation Summary)

    The soil/groundwater assessment is part of the RI/FS being conducted at the Livermore Site. The draft RI was submitted to the regulatory authorities on December 1, 1989. The Site 300 assessment and cleanup activities consist of multiple projects. More detail on specific assessment activities at Site 300 may be found in the Site 300 Environmental Restoration Plans. The S&M activities involve Buildings 212, 281, 291, and 412. Assessment and design will be performed in FY 1991; cleanup is to be performed in FY 1992 and FY 1993.

40. At ETEC, groundwater and radiological surveys, surveillance, maintenance, and decommissioning of surplus facilities and soil cleanup are ongoing. (Status section from Installation Summary)

    Groundwater monitoring wells have been drilled, and sample analysis has been initiated as part of the monitoring program. D&D activities have been initiated for Building 059 and the Rockwell International Hot Laboratory. S&M activities are ongoing at Building 024 and at the RMDF. It is not clear to SAN what soil cleanup activities were to have been ongoing last year. None has been completed in FY 1989, and none is ongoing in FY 1990.

41. At LEHR, D&D is under way. (Status section from Installation Summary)

    A subcontract for a 1-year, detailed site characterization study has been awarded. Arrangements for the disposition of the radioactive archival specimens and biological waste have been made. The current schedule for final certification is FY 1992.

42. At LBL, a PA/SI of onsite soil and groundwater contamination will be complete in FY 1990. (Milestone section from Installation Summary)

    Preliminary sampling activities are under way, and early sampling results reconfirmed the presence of chlorinated hydrocarbons.

43. Based on the presence of contamination, a PA/SI is not being performed, and the study has been expanded to a sitewide assessment. The assessment will be complete in FY 1993.

44. At SLAC, PCB soil cleanup is ongoing. (Status Section from Installation Summary)

    The PCB soil cleanup at SLAC is continuing and will be complete in FY 1990. Additional funding is not required.

WASTE MANAGEMENT OPERATIONS

1. High-level waste will be disposed of in a geologic repository. (p. 122)

   This is required by law, and DOE remains committed to this action.

2. Remote-handled transuranic (RHT) waste will also go to a geologic repository. (p. 122)

   RHT will be sent to the WIPP if and when WIPP demonstrates acceptable disposal performance.

3. Waste management improvements are carried out with the goals of minimizing outyear liabilities, being more cost-effective, and avoiding disruptions to mission activities. In no case, however, will protection of workers, the public, or the environment be sacrificed. (p. 126)

   DOE is still committed to these goals for Waste Operations.

4. Goals for managing high-level waste are to prepare the waste for safe storage and to store it until facilities are available for disposal. (p. 126)

   DOE is still committed to these goals for Waste Operations.

5. Goals for managing TRU waste are to prepare the waste for safe storage and to store it until facilities are available for disposal. (p. 126)

   DOE is still committed to these goals for Waste Operations.

6. The goals for managing low-level radioactive waste are to treat the waste to reduce its volume and dispersibility and to dispose of it in facilities that give increased environmental protection. (pp. 126, 127)

   DOE is still committed to these goals for Waste Operations.

7. Goals for managing hazardous waste and mixed wastes are to avoid its generation and to destroy hazardous nonradioactive constituents. (p. 127)

   DOE is still committed to these goals for Waste Operations.

8. Sanitary waste facilities are managed with the goal of burying solid sanitary wastes, while complying with all applicable regulations. Operational goals are to develop cost-effective improvements to ensure regulatory compliance and reduce expenditures. (p. 127)

   DOE is still committed to these goals for Waste Operations.

9. DOE plans to include both mixed waste and hazardous waste in the Integrated Data Base. (p. 138)

   The November 1989 revision of the Integrated Data Base included a chapter on mixed low-level waste. DOE is working to collect and validate data on the other waste categories for subsequent revisions.

10. DOE intends to integrate the Integrated Data Base with the Operations Offices' waste tracking systems to determine how successfully DOE is meeting its goal of waste minimization. (p. 138)

    DOE is evaluating the feasibility of this approach.

11. DOE is also developing a Defense Program Data Base system that will reside on the Oak Ridge Waste Information Network. In a few months the Defense Program Data Base system will be capable of accepting information directly from all DOE sites. (p. 138)

    This data base is under development by the Hazardous Waste Remedial Actions Program (HAZWRAP) at Oak Ridge, Tennessee. Intersite data-transfer capabilities are not yet available for the Defense Waste Data Base.

12. Pending resolution of several remaining administrative, technical, and institutional issues, DOE will soon begin shipping TRU waste to the WIPP facility in New Mexico. (p. 142)

    DOE will begin shipping waste to WIPP when the Secretary of Energy decides that the facility is ready to accept waste. This decision is expected in the mid-June 1990 time frame.

13. DOE now plans to use 100 percent truck transport to WIPP. (p. 142)

    This is still DOE's plan.

14. DOE will work closely with the affected States to develop solutions to the concerns raised in the Western Governors' Association Working Group report on transportation of TRU Waste to WIPP. (p. 143)

    DOE is still committed to maintaining a close working relationship.

15. The DOE waste minimization program will focus on all liquid and solid wastes that are planned to be disposed of by avoiding generation and by recycling as much material as possible. Where waste is unavoidably generated, it will be treated to reduce its volume and to stabilize it by the best technology that can be devised. (p. 146)

    This is still DOE's objective.

16. Formal programs are either being developed or are in place at all DOE sites. (p. 146)

    This is true.

17. The Secretary of Energy will ensure that waste minimization receives direct attention from DOE Headquarters. (p. 148)

    DOE Headquarters is placing continued emphasis on waste minimization, consistent with the Secretary's direction to establish DOE line management accountability for environment, safety, and health requirements.

18. Headquarters will provide overall direction and coordination of the Waste Minimization Program through the various affected Assistant Secretaries to all DOE Operations Offices. (p. 148)

    This function is the responsibility of the Division of Technical Support (EM-35) within the Office of Waste Operations.

19. Operations Offices will incorporate waste minimization as an organizational entity and direct similar structures within their contractor organizations. (p. 148)

    This is in process.

20. Implementation and successful execution of the DOE-wide waste minimization program will be an Operations Office responsibility closely monitored by Headquarters. (p. 148)

    This is still true.

21. DOE Headquarters will take the lead in providing coordination with other Federal agencies and with scientific review organizations. (p. 148)

    EM-35 is working to fulfill these commitments.

22. Foreign bilateral technology exchange agreements will be negotiated or modified as appropriate to promote free technology exchange. Headquarters will provide guidance for required goal setting, tracking, and reporting systems. (p. 148)

    EM-35 is working to fulfill these commitments.

23. The concept of Cost Plus Award Fee will be expanded. (p. 148)

    EM-35 is working to fulfill these commitments.

24. Additional forums on Waste Management are planned. They will include participants from other Federal agencies and scientific organizations. (p. 148)

EM-35 is working to fulfill these commitments.

25. Innovative technical and administrative production changes will continue to be made. (p. 148)

EM-35 is working to fulfill these commitments.

26. The goal of radioactive waste treatment is to put the waste in a safe and acceptable form for extended storage or disposal. (p. 150)

This is still DOE's goal.

27. DOE is continuing to implement cost-effective, acceptable waste forms for radioactive waste and is in the process of converting waste into final form for disposal. (p. 150)

DOE continues to follow this practice.

28. Three DOE facilities are planning to incorporate the vitrification process: the Defense Waste Processing Facility at Savannah River, the West Valley Demonstration Project at West Valley, and the Hanford Waste Vitrification Plant at Richland. (p. 154)

This is still true.

29. Design of an immobilization facility is now planned to begin in FY 2002 if this is the decision of DOE. (p. 154)

DOE has not made any final waste form decisions regarding the calcined HLW at INEL.

30. DOE will treat TRU waste to comply with stringent acceptance criteria for disposal in a planned geologic repository. (p. 156)

This is still a valid statement.

31. WIPP near Carlsbad, New Mexico, will be the disposal facility for TRU waste. (p. 156)

A decision has yet to be made regarding the acceptability of WIPP as a disposal facility for TRU waste. This decision will be based on the results of a five-year demonstration period in which the long-term performance of WIPP will be evaluated.

32. DOE will provide data and information for EPA's consideration in developing treatment standards for mixed waste and will continue to ship hazardous waste offsite for treatment and disposal until onsite incineration is available. (p. 160)

This activity is ongoing.

33. DOE will treat HLW and TRU waste to meet disposal standards for the radioactive components of the waste. (p. 160)

DOE will do this.

34. Plans are for the Toxic Substances Control Act (TSCA) Incinerator at Oak Ridge to be fully permitted to incinerate mixed and hazardous waste by the end of FY 1989. (p. 160)

At this time, the TSCA Incinerator at Oak Ridge is not fully permitted to process hazardous and mixed wastes. This is expected to happen sometime in the 3Q FY 1990.

35. Incineration of low-level mixed waste is planned at Savannah River and Albuquerque. (p. 160)

This is partially true. DOE is not planning to incinerate low-level mixed waste at Albuquerque but rather at the Los Alamos National Laboratory (LANL) in northern New Mexico. LANL is under the direction of the Albuquerque Operations Office. Low-level mixed waste incineration will also take place at the Savannah River Site, near Aiken, South Carolina.

36. INEL, the third site generating liquid high-level waste, is generating planning to begin construction of new tanks for storage of liquid HLW in 1991. (p. 162)

This is still true.

37. DOE's goal is to provide, as quickly as practicable, facilities and programs that will allow GTCC low-level waste generators management options other than onsite storage at the place of generation. RCRA Permit requirements will be fully addressed as part of the design and construction phases. (p. 163)

This is still DOE's goal.

38. Extensive upgrades and new tank construction are being planned to meet RCRA permit requirements for low-level liquid mixed waste. (p. 163)

DOE is in the process of the completing necessary upgrades to meet the regulatory requirements.

39. The planned vitrification facilities for Hanford and Savannah River high-level waste will produce a high-integrity waste form suitable for final disposal in DOE's planned geologic repository. Each treatment facility will include storage capability for its product, with the capability to add additional storage space dependent upon when the geologic repository is ready to receive high-level waste for disposal. Plans for the final form of INEL high-level waste are still under development. (pp. 166 & 167)

This is still a true statement.

40. The two primary objectives of the WIPP Test phase are to demonstrate (1) reasonable assurance of compliance of the WIPP disposal system and (2) the ability of the DOE TRU waste management system to safely and effectively certify, package, transport, and emplace waste at WIPP. Both objectives will be accomplished by conducting activities in parallel with full assurance of safe operations and protection of the environment. (p. 170)

DOE is committed to operating WIPP in a safe and environmentally protective manner.

41. At the conclusion of the Test Phase, an evaluation will be performed to determine whether WIPP should proceed to the disposal phase. (p. 170)

DOE is still committed to this approach.

42. DOE plans to form a blue-ribbon panel of recognized experts from industry, academia, and government to review current plans for demonstrating WIPP's technical and operational adequacy. (p. 171)

DOE has formed a "Blue-Ribbon" Panel for WIPP. The panel has been active in reviewing and providing recommendations on the various WIPP technical plans.

43. DOE will provide interim storage for a limited quantity of GTCC low-level waste pending availability of long-term dedicated storage and, based on current plans, would provide for general acceptance of GTCC low-level waste for storage by 1995. This dedicated storage capability will be designed to be consistent with NRC specifications for licensing such facilities and will provide extended storage capabilities until the disposal capability can be developed. (p. 172)

This is still DOE's objective.

44. DOE will continue to build RCRA-permitted facilities for storing hazardous materials, including appropriate shielding for the radioactivity in mixed (hazardous plus radioactive) wastes. (p. 174)

DOE plans to continue building RCRA-permitted facilities to handle its near-term storage needs. However, DOE does not enjoy being in the permanent storage business and would like to proceed with disposal of its hazardous and mixed wastes.

45. Safe disposal of low-level waste in near-surface facilities will continue in the future while meeting definitive performance criteria. (p. 177)

DOE has established performance criteria for its low-level waste disposal facilities. DOE plans to continue the use of near-surface disposal systems that are enhanced by appropriate engineered characteristics in order to satisfy these criteria.

46. Transuranic and mixed low-level waste will be safely disposed of in the 1990s, and disposal of the most challenging waste, high-level waste, will be achieved soon after the turn of the century. (p. 177)

DOE is working to achieve these goals.

47. With the change in emphasis on waste management, DOE intends to begin making payments into the Nuclear Waste Fund to cover costs incurred on its behalf. (p. 181)

DOE begins making payments to the Nuclear Waste Fund in FY 1991. The preliminary amount is approximately $200M per year.

48. By 1993, Richland will discontinue the disposal of contaminated liquids from 19 waste streams to the soil column by either eliminating the stream or treating it before disposal. (p. 182)

The Hanford site is working aggressively to meet this goal.

DRAFT APPLIED RESEARCH, DEVELOPMENT, DEMONSTRATION, TESTING, AND EVALUATION PLAN (FOREWORD AND SECTION 1)

1. DOE is committed to a 30-year goal of achieving compliance and accomplishing the environmental restoration of its sites. (p. xvi)

   and

2. DOE is committed to restore the environment. (p. 8)

   DOE has established an organization responsible for waste management and environmental restoration activities. Leo Duffy and his staff are committed to the 30-year cleanup goal to restore the environment and to achieve and maintain compliance at all of DOE's facilities.

3. The DOE Office of Environmental Restoration and Waste Management will work with the Assistant Secretary for Management and Administration to help involve private industry in seeking and implementing solutions by establishing a streamlined procurement process 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. (p. xvi)

   and

4. DOE will implement a process to identify the best technologies emerging from all sectors, public and private. (p. 8)

   and

5. DOE will explore procurement policies that relate successful R&D to demonstration projects and to future full-scale implementation. (p. 28)

and

6. Development of phased contracts will be pursued so that multiple demonstration contracts can be awarded only to qualified vendors and demonstration procurement can include a fixed unit price for future full-scale work. (p. 28)

and

7. DOE will establish a general policy governing the ownership of new inventions resulting from RD&D activities that will enable negotiations to equitably protect legitimate rights to use or exclusively own technology developed from DOE-funded demonstrations. (p. 28)
DOE has planned a number of efforts for involving private industry in seeking and implementing solutions by developing a draft request-for-proposal process directed at eliciting R&D involvement by private industry. It is also in the process of developing a request-for-proposal process for demonstrating, testing, and evaluating private industry technologies at DOE sites. In the San Francisco meetings, the First Annual Symposium for RDDT&E, and other DOE meetings, barriers to private industry participation in DOE's environmental restoration and waste management activities were identified. The draft request for proposal processes will be used as "case studies" for development solutions to the identified barriers.

8. DOE will establish new partnerships with universities and other educational institutions to develop new and enhanced undergraduate and graduate curricula in disciplines pertinent to DOE's Environmental Restoration and Waste Management Operations programs. (p. 8)

and

9. EM will provide policy guidance and oversight of university programs and will develop updates of the RDDT&E portion of the Five-Year Plan. (p. 22)

DOE is establishing new partnerships with universities and other educational institutions to develop new and enhanced undergraduate and graduate curricula in disciplines pertinent to its environmental restoration and waste management activities. Each field office is in the process of establishing "partnerships" with their regional universities. See Section 5.7.2 of the FY 1992-1996 Five-Year Plan.

10. EM will foster greater cooperation among the national laboratories by rewarding joint efforts. (p. 8)

DOE is fostering greater cooperation among the national laboratories by rewarding joint efforts. An example of one of the activities funded for 1990 as a joint effort includes the integrated R&D demonstration for groundwater pumping and treating methods that is currently being conducted at Savannah River.

11. DOE will clearly define an interface between basic and applied research. (p. 8)

DOE has established a working group that comprise DOE and national laboratory representatives to define the interface between basic and applied research. Proposals submitted to EM that were determined to be basic research were given to Energy Research for inclusion in its programs. Applied research will be conducted by EM.

12. DOE will pursue broad interagency agreements for RDDT&E with EPA and other agencies. (p. 9)
Meetings with the other federal agencies (e.g., EPA and DOD) have been held to discuss opportunities for pursuing interagency agreements for RDDT&E activities.

13. To meet its 30-year compliance and cleanup goal, DOE will conduct RDDT&E to respond to the issues and needs identified in its Environmental Restoration and Waste Management Five-Year Plan. (p. 12)

and

14. A formal, institutionalized needs analysis process will be developed to ensure focused RDDT&E on prioritized needs. (p. 38)

External peer review for involving the National Academy of Sciences and other national and international expert bodies is being developed and pursued.

DOE has initiated a process for formally identifying RDDT&E needs. The "roadmap" process has been initiated, and the process is currently being tested at Rocky Flats. The FY 1990 call for proposals by OTD was based on the needs identified in the 1989 RDDT&E Plan. Other projects and studies are being conducted by DOE to improve RDDT&E programs; for example, robotics workshops have been held.

15. DOE will encourage, develop, and allocate additional human resources to solve the problems identified in the Environmental Restoration and Waste Management Five-Year Plan. (p. 14)

and

16. The new OTD will develop policy, manage, and provide oversight in review of RDDT&E activities performed under the day-to-day direction of DOE Operations Offices. (p. 22)

and

17. A procedural framework will be developed to ensure that applicable program requirements flow down to the appropriate procedures and instructions for controlling the work. (p. 36)

OTD has been developing a management system and the associated policies for directing, managing and reviewing all RDDT&E activities. The procedural framework has been applied this year and is undergoing refinement to ensure that applicable program requirements flow down to the appropriate procedures and instructions for controlling RDDT&E activities. DOE is training and allocating additional personnel to solve its environmental restoration and waste management problems. Numerous staff positions have been identified and filled over the past year. OTD's ability to meet all its commitments will be enhanced as positions are staffed and the management systems are further developed.

18. DOE will make OTD the focal point for Work for Others for hazardous waste. (p. 8)

    OTD is pursuing agreements with EPA, DOD, and others for cooperative efforts in RD&D for hazardous waste.

19. DOE will establish a liaison with other DOE program offices for waste minimization. (p. 8)

    A Waste Minimization Team has been established (November 1989).

20. DOE will continually seek peer review from the National Academy of Sciences and other national and international expert bodies and professional societies. (p. 9)

    External peer review is extensive and described on p.xi of the FY 1992-96 Five-Year Plan.

21. DOE will provide the scientific foundation necessary to increase the effectiveness of Environmental Restoration and to address technological and regulatory questions associated with development and future use of new or existing technologies. (p. 10)

    Technological and regulatory issues in development are described in Section 1.14 of FY 1992-1996 Five-Year Plan.

22. OTD will work closely with EH to ensure that RDDT&E activities are coordinated and that changes in the evolving regulatory arena are anticipated and accommodated. (p. 19)

    OTD has interacted with EH for the RDDT&E Plan and Five-Year Plan Update. EH has actively participated in the writing and review of these documents.

23. A special team will be established in DOE Headquarters to evaluate options and to address the issues of indemnification, passing of liability protection, and equitable sharing of risk between contractors and subcontractors. (p. 28)

    The Secretary of Energy announced in the January 26, 1990, Federal Register that the Department would no longer indemnify its contractors.

24. International concepts and proposed solutions for the Office of Environmental Restoration and Waste Management will be given renewed emphasis and a line organization responsibility by DOE. (p. 30)

    An international technology program has been established in the Program Support Division of OTD.

25. Increased resources will be applied to allow DOE to expand its efforts and assume a leadership role in making these activities more aggressive and productive in meeting the common needs. (p. 33)

    As shown in Attachment D, over 90 percent of the OTD budget in FY 1990 represents new starts.

26. A program office will be established in early FY 1990 at one of the field offices to provide technical support for Applied R&D programs. (p. 38)

    An applied R&D Program Coordination Office has been established at the Chicago Operations Office. Its structure is described in Section 5.2.1 of the FY 1992-1996 Five-Year Plan.

27. A Management and Implementation Plan will be prepared to guide OTD in directing the RDDT&E program. (p. 41)

    Preparation of a management and implementation plan has begun.

28. In relative terms, DOE will filter sets of competing candidate technologies for both their regulatory-related and technical compatibility. (p. xix)

    A draft report, "Candidate Technologies for Applied Research, Development, Demonstration, Testing, and Evaluation," was issued in November 1989 for comment by the DOE Field Offices. This report allows review of selected technologies for potential application to DOE's environmental restoration and waste management problems, including comparisons on technical and regulatory bases. See also Section 5.2.1 of the Five-Year Plan Update.

29. Programs will be designed to identify operational needs in the areas of Environmental Restoration, Waste Management, and Corrective Activities to rapidly advance beyond currently available technology and to provide solutions to key technical issues that, if not solved in a timely manner, will adversely affect DOE's ability to meet its 30-year cleanup goal and its operational goal. (p. 22)

    Roadmaps are being prepared to identify time-phased development links from Environmental Restoration, Waste Management, and Corrective Activities to technology development. These logic diagrams identify key issues to be resolved and the needs for new or improved technology to ensure that DOE meets its 30-year goal.

30. Programs will be designed to rapidly advance the technology to address, in a cost-effective manner, DOE's ability to meet its 30-year cleanup goal. (p. 22)

Technology road maps being developed will identify the processes necessary to develop the most promising, cost-effective and timely technologies needed to achieve the 30-year cleanup goal. Technology development programs based on these road maps will enable coordination of activities, development of cost reductions, and timely achievement of goals.

31. A prioritization methodology will be developed to ensure that deserving technologies receive funding and program support. RDDT&E task proposals will be screened to identify duplication of effort and cost-effective solution. (p. 26)

As part of the FY 1990 process, a proposal evaluation and prioritization methodology was developed and tested on a subset of proposals. Proposals were also reviewed to ensure that redundancies were identified and resolved before work authorization. See also Section 5.6 of the Five-Year Plan Update.

32. Approval of RDDT&E tasks will be based on consideration of a number of factors, including whether:
   - there is a likelihood of success, (p. 26)
   - results will be useful at a number of sites, (p. 26)
   - results will be timely, (p. 26)
   - there is a probable significant reduction in ultimate Environmental Restoration and Waste Management program cost if implemented, (p. 26)
   - costs of development are reasonable, (p. 26) and
   - expected results will satisfy regulatory requirements. (p. 26)

As part of the FY 1990 proposal review process, a proposal evaluation methodology was developed and tested on a subset of proposals. This methodology included consideration of the factors listed. Based on evaluations of the methodology, modifications are being made for application to the FY 1991 selection process.

33. Management emphasis will be placed on this effort to exploit promising technologies whenever possible by:
   - Expanding DOE's current information base on radioactive waste management to include available data on all activities (D&D, QA, and regulatory) and waste types (mixed, hazardous, and sanitary). (p. 30)
   - Determining compatibility of available foreign DOE RDDT&E needs with technologies. (p. 30)
   - Conducting multicountry surveys by technical teams. (p. 31)
   - Issuing a summary compilation of available information on foreign technologies and agencies. (p. 31)
   - Surveying, evaluating, and selecting potential foreign technology for exchange. (p. 31)
   - Developing a strategy and action plan for negotiations on technology exchange with foreign countries. (p. 31)
   - Addressing problems related to de minimis radiation levels. (p. 31)
   - Negotiating exchanges, including agreement conditions with foreign countries, when beneficial. (p. 31)
   - Implementing foreign technology exchange. (p. 31)
   - Evaluating the effectiveness of each foreign technology exchange program. (p. 31)

OTD has established active domestic and international technology transfer programs designed to identify potential technologies that could be implemented by DOE and to transfer those technologies into development and implementation efforts. Relationships with other domestic and foreign industries, agencies, and academia are being established to facilitate technology identification and evaluation.

34. OTD will implement a multifaceted program to solicit the broadest possible participation using innovative technologies to solve Environmental Restoration and Waste Management problems by rapidly moving technologies through the Applied Research and Development Phase and the Demonstration and Testing phase for evaluation as available technology. (p. 38)

The movement of projects between development phases is described in Section 5.2.2 of FY 1992-1996 Five-Year Plan.

35. DOE will sponsor an annual waste research symposium. (p. 39)

This remains a commitment.

36. DOE will support scientific training and education to build the base of scientific skills needed to address problems of ER continuing into the 21st century.

The Education Development Program has developed a program that includes scientific training and education as integral parts of a framework. Training is included in the form of workshops and seminars, as well as educational support in the form of partnerships, fellowships, scholarships, faculty awards, and academic program development. All activities are planned in the context of an ongoing program over the 30-year commitment of the RDDT&E Plan.

37. DOE will promote the passage of a National Environmental Education Act to encourage science and engineering students to specialize in needed disciplines for EM.

and

DOE will develop, in collaboration with the Department of Education, the NSF, and other federal agencies that share in the problem the "National Environmental Education Act" to encourage science and engineering education in the EM fields. (p. 15)

DOE is implementing activities that encourage science and engineering education in the EM arena. The development of a National Environmental Education Act by the appropriate legislative bodies will be

supported by DOE and will represent a national directive to continue and strengthen the framework that has already been established.

38. DOE is committed to a broad outreach program that goes beyond university-laboratory partnerships.

    The Outreach part of the Education Development Program has been structured in two initiatives, each with a unique purpose. A field office initiative has been established to allow each DOE field office to develop outreach activities that are specifically structured to achieve the regional objectives and needs of each field office. A Headquarters initiative will be established to add activities that are national in scope and perspective.

39. A central element of DOE's EM outreach program will be attracting primary and secondary school students into the scientific and engineering career fields. (p. 15)

    Students, particularly at the 6th to 8th grade level, who are competent in science and mathematics must be motivated and supported before their option for a technical career is foreclosed.

40. DOE's goal, within the context of the Five-Year Plan, is to develop and implement an initiative to encourage cooperative applied RDDT&E and science and engineering education in partnership with regional universities, laboratories, and primary and secondary schools; to expand innovative programs to improve technical skills; and to increase the participation of heretofore underrepresented segments of the labor market in science and engineering. (p. 15)

    The program framework that has been developed is a comprehensive plan of action that includes university partnerships, fellowships, scholarships, faculty awards, minority fellowships and scholarships, academic program development, training, workshops, and outreach. The program covers the education spectrum and is designed to be an effective initiative for reaching the underrepresented segments of the labor market.

41. The RDDT&E TQM Program will provide for the indoctrination and training of personnel performing activities affecting quality to ensure that suitable proficiency is achieved and maintained. (p. 36)

    As the Total Quality Management Program is developed, the training will be assessed and implemented. One method that could be used, depending on the TQM Program requirements, would be to utilize the EM Special Interest Group (SIG) that has been formed as part of the Training Resources and Data Exchange (TRADE) program. SIG could develop the training requirements, recommend the training reference manual content, develop survey data to measure the effectiveness of the training, etc.

42. The objective of technology initiatives related to problems at facilities currently under the cognizance of the Assistant Secretaries for Defense Programs and Nuclear Energy and the Director, Office of Energy Research, is to make needed new or adapted technologies available before the end of FY 1995, as well as to begin initiatives required within that time period to make new technologies available beyond FY 1995. (p. xiii)

    This is the charter of the newly formed Office of Technology Development. See Section 1.6 in the FY 1992-1996 Five-Year Plan.

43. OTD will encourage private industry involvement in RDDT&E waste problems and site cleanups that involve minimal security considerations. (p. 29)

    Private industry is being encouraged to participate in OTD activities. OTD recently sponsored a symposium in San Francisco to publicly present an outline of partnership between industry, university, and DOE.

44. The RDDT&E Program will also develop in response to newly identified technology needs. (p. 4)

    This remains a commitment. Several new technology roadmaps are being developed. See Section 1.7 in the FY 1992-1996 Five-Year Plan.

45. DOE will conduct its RDDT&E program in a consensus forum. Conferences, written material, and invitations to observe key demonstrations of new technologies will keep the public abreast of progress. (p. xviii)

    Demonstrations of technology such as in situ vitrification have been presented to the public. Written information is always available to the public through the Freedom of Information Act.

46. DOE will work with the EPA, the NRC, the State and Tribal Government Working Group, and other organizations to address in parallel the regulatory and technical aspects of technology development so DOE can progress expeditiously to full-scale deployment. (p. 8)

    The Foreword to the FY 1992-1996 Five-Year Plan describes this matter.

47. More effective waste treatment methods will be developed. (p. 13)

    and

48. More effective treatment methods will be pursued, including in situ drum biodegradation of stored mixed waste. (p. 13)

    and

49. Applied RDDT&E will also be performed to develop technologies for treating noncombustible waste, including waste containing heavy metals such as lead and uranium. (p. 13)

Multiple technologies are being explored for the elimination of noncombustible waste, including heavy metal elimination. Waste treatment technology is described in Section 5.3.2 of the FY 1992-1996 Five-Year Plan.

50. This technology base will be significantly broadened and expanded to other areas of research related to hazardous and mixed waste management and environmental restoration to ensure that (1) the DOE goal of a 30-year cleanup can be met, (2) DOE's Environmental Restoration and Waste Management programs can be conducted in full compliance with all regulatory requirements, and (3) significant reductions can be realized in the cost estimates provided in the Environmental Restoration and Waste Management Five-Year Plan. (p. 13)

The technology base is currently being surveyed for new approaches to waste questions using the ADSs. Laboratories and field offices are evaluating regulatory compliance. The impact on cost is being evaluated.

51. "Test bed" facilities will be developed at DOE sites where a contamination problem exists that offers the potential for integration of multiple participants in various aspects of characterization, remediation, and instrumentation as well as technology applications. (p. 29)

Test bed facilities are being developed at Hanford and INEL for demonstration of technologies such as in situ vitrification and cryogenic stabilization.

52. Technology transfer forums will be led by DOE and cosponsored by other agencies to explore specific technologies, such as supercritical water, or specific problems, such as groundwater remediation. (p. 33)

Three forums have been completed (Biotechnology Review, Real-Time Subsurface Monitoring of Groundwater, Temporary In Situ Barriers). Another (Thermal Treatment of Soils) is scheduled for June 1990.

53. A more integrated, centralized data base and information management system will be developed to link existing site systems and implement a coordinated Environmental Restoration and Waste Management Operations RDDT&E Program. (p. 34)

and

54. Data management systems will be developed or revised and modified to serve as site-specific repositories for all physical, chemical, and environmentally relevant data associated with each site.

and

55. The design of the data bases will be standardized, and the data will be accessible throughout the DOE system.

DOE has held several meetings with the national laboratories to discuss the development of a comprehensive, integrated information management system. Current systems are being evaluated to determine the appropriate mechanisms for linking the existing data bases and developing the integration features.

56. QA procedures will be carefully designed and implemented according to QA needs in different phases of the program. (p. 36)

This program goal will be accomplished by the individual organizations responsible for RDDT&E tasks, rather than as an overall program activity. The 1989 RDDT&E Plan stated that participating organizations "will be required to have a QA Program Description to the detail necessary to ensure that task objectives and requirements will be achieved." Administrative control of these activities will be provided through field office approval of QA program descriptions.

57. DOE will require all RDDT&E activities to address as a parallel issue regulatory compliance and the need for public involvement in DOE's RDDT&E activities. (p. xvii)

DOE is establishing mechanisms for addressing regulatory compliance and public involvement on a parallel path with technology development. For example, regulatory requirements will be key criteria for determining whether an R&D activity will be funded during the DT&E phase and whether a DT&E activity will move to applications. OTD is supporting milestones based on regulations and interagency agreements by selecting RDDT&E projects that are focused on determining solutions to the problems addressed by those milestones. By considering regulatory requirements throughout the technology development process, the selected remediation methods will be capable of meeting all relevant regulatory requirements during remediation.

58. The RDDT&E program will work to end the "not-invented-here" syndrome and ensure interdisciplinary and interlaboratory cooperation by emphasizing partnerships with universities and industry and technology coordination groups. (p. xvi)

Within OTD, the Department has mandated that DOE Operations Offices will team with one another to develop solutions to ongoing technical problems associated with environmental restoration and waste management.

To ensure cooperation among DOE, industry, and universities, OTD has formed a Division of Educational Program Development. Within this division, two branches have been formed: the Technology Integration Branch and the Education Curriculum Branch. A symposium was sponsored by OTD in

San Francisco on December 12, and 13, 1989, to publicly present a partnership concept that will ensure ongoing cooperation among DOE, industry, and universities.

59. This Plan describes a rational approach to the integration of existing technologies from other agencies, international technologies, university and industrial capabilities, regulatory and public policy processes, and basic research. This coordination and cooperation will be established through the development of various partnerships managed by the DOE Operations Offices, for example. (p. xviii)

As an example of the efforts of one DOE site in the development and implementation of a partnership agreement, INEL and Montana State University have founded the Institute for Biological and Chemical Analysis. Other DOE sites are forming similar partnership agreements.

In the development of ADSs, initiators were required by OTD to directly identify anticipated partnership arrangements among the laboratories, contractors, industry, and universities. As a result of this requirement, teaming was initiated by all sponsoring organizations submitting ADSs. Beneficial R&D teaming arrangements are anticipated in the development of technologies supporting Environmental Restoration and Waste Management projects.

60. The needs of DOE's RDDT&E program will be met by expanding the scope of current activities through negotiation and completion of collaborative exchanges on selected R&D topics with foreign entities. (p. 30)

OTD is developing planning documents specifically designed to facilitate cooperation with foreign entities in the area of technology transfer.

61. More open communications with EPA and the States will be promoted through conferences and invitations for site visits to demonstration sites and by providing plans and project proposals for review. (p. 19)

Within OTD, the Division of Technology Integration, a program plan for technology transfer and information sharing is being developed. As an integral part of this plan, a formal methodology for technology sharing and communications among the EPA (and other Federal agencies), the states, and all DOE sites is being developed for implementation.

62. Cooperative efforts and joint proposals between DOE laboratories and private industries that share similar waste problems will be supported.

To ensure cooperation among DOE, industry, and universities, OTD has formed a Division of Educational Program Development. Within this division, two branches have been formed: the Technology Integration Branch and the Education Curriculum Branch. A symposium was sponsored by OTD and in San Francisco on December 12 and 13, 1989, to publicly present a partnership concept that will ensure ongoing cooperation among DOE, industry, and universities.

In the development of ADSs, initiators were required by OTD to directly identify anticipated partnerships arrangements among the laboratories, contractors, industry, and universities. As a result of this requirement, teaming was initiated by all sponsoring organizations submitting ADSs. Beneficial R&D teaming arrangements are anticipated in the development of technologies supporting Environmental Restoration and Waste Management projects.

63. The new OTD will involve EPA and other regulatory authorities in the earliest stages to ensure that regulatory compatibility and technological feasibility are pursued on parallel paths. (p. 18)

To further enhance the concept of technology development in a partnership atmosphere, OTD is developing program planning and implementation documents in the categories of Education Curriculum and University Participation, National Technology Transfer (including interagency cooperation and industry involvement), and International Technology Transfer. To facilitate the development and implementation of these planning documents, working groups and committees are being formed with representatives from DOE, laboratories and contractors, other federal agencies, industry, and universities.

64. The new OTD will sponsor new, as well as ongoing, work with other Federal agencies to exchange information, jointly fund, and collaborate on RDDT&E to avoid duplication of effort in developing and deploying technologies to resolve Environmental Restoration and Waste Management problems. (p. 32)

and

65. Initiatives for cooperative technology development activities will be undertaken with the National Institute of Standards of Technology, U.S. Geological Survey, Occupational Safety and Health Administration, and others. (p. 33)

To further enhance the concept of technology development in a partnership atmosphere, OTD is developing program planning and implementation documents in the categories of Education Curriculum and University Participation, National Technology Transfer (including interagency cooperation and industry involvement), and International Technology Transfer. To facilitate the development and implementation of these planning documents, working groups and committees are being formed with representatives from DOE, DOE laboratories and contractors, other federal agencies, industry, and universities. The program planning and implementation documents will stress the planning and implementation of interagency cooperation, information

exchange, and communication to avoid duplication of effort.

66. Continuation of this valuable interface will be strongly supported. (p. 33)

    To ensure a continuation of this important effort, OTD has established the Division of Technology Integration to plan, implement, and ensure continuation of technology transfer among DOE, other Federal agencies, universities, private industry, and foreign concerns.

67. Other initiatives, specifically with DOE, will be pursued to cement interagency partnerships. (p. 33)

    To facilitate the development and implementation of interagency partnerships, working groups and committees are being formed with representatives from DOE, national laboratories and contractors, other federal agencies, industry, and universities. The program planning and implementation documents (currently being developed) will stress the planning and implementation of interagency cooperation, information exchange, and communication to avoid duplication of effort.

68. Although OTD will not prioritize cleanup and compliance activities, it will contribute to setting those priorities. DOE's prioritization methodology will include, among other criteria, the relative power or weakness of current technology and the likelihood that new, more effective, and less costly technologies will be deployable in time to meet regulatory requirements. (p. xiii)
    Section 1.4 in the FY 1992-1996 Five-Year Plan defines DOE priorities.

69. DOE has begun and will continue to evaluate existing and emerging technologies according to a system of attributes such as effectiveness in solving or providing interim measures to confine or contain a problem, the magnitude and/or level of the problem, estimated time and dollars to implement, and others. (p. xix)

    and

70. A systems engineering approach will be used to organize the RDDT&E program to ensure that the most promising technologies are funded and developed. The RDDT&E program will include a cooperative interface with Environmental Restoration and Waste Management Operations activities to identify RDDT&E needs at the field level and will implement a systematic process for prioritizing RDDT&E tasks for funding. (p. 26)

    Section 5.6 in the 1992-96 Five-Year Plan describes the evaluation process for emerging technologies.

71. DOE will involve the public early and clearly define to the regulatory bodies the process of technology selection to ensure regulatory acceptability and speed the issuance of permits. (p. xvii)

    Activities requiring regulatory approval and permitting are still in the planning stages.

72. With public participation, DOE will develop a rigorous, consensus-based prioritization methodology for RDDT&E activities. (p. 8)

    Interested and affected parties have been solicited for their input to the overall plan. Comments have been and will continue to be incorporated. See also Sections 5.6 and 5.7 of the Five-Year Plan Update.

73. DOE will complete a benefit/cost analysis by FY 1992. (p. 8)

    In the development of ADSs to propose or support a specific technology development activity, OTD requires that a preliminary statement of benefit be developed. Based on the statement of benefit, a preliminary screening will be performed by each DOE field office before the activity is submitted to OTD.

74. Benefit-cost information will be a key input to the project selection methodology described in Section 1.3.1. (p. 21)

    Work has been funded and a workshop sponsored by OTD to develop a methodology for determining the cost/benefit of proposed R&D activities.

75. DOE will make waste minimization a key factor, not only in process and facility modification but also in the procurement of goods and services. (p. xvii)

    and

    Complexwide strategies will address issues like the management of mixed wastes, regional treatment facilities, and intersite recycle and processing of recovered materials. (p. xviii)

    DOE is establishing a complexwide tracking system to establish baseline reporting of waste streams. The system will be used to characterize intersite shipments and evaluate the effectiveness of regional treatment and storage facilities. Procurement organizations could use the system to prevent redundant or inefficient purchases of waste treatment/storage hazardous materials. A DOE waste minimization integration team has been established. The team consists of members from three DOE laboratories with DOE/EM oversight: INEL (small generators of waste), SNL (hazardous waste), and Oak Ridge Y-12 (radioactive and mixed waste).

76. RDDT&E will be directed toward (1) process changes and chemical substitutions to eliminate or significantly reduce the amount of toxicity of hazardous and mixed waste generated; (2) material recycling and reuse; and (3) in-process segregation and concentration of waste streams, especially mixed waste, which would require complex treatment and disposal methods. A major goal of the Waste Management program is a significant

reduction in mixed waste generation, primarily through process changes and waste stream segregation. (p. 13)

Several opportunities for minimization will be explored:

- Forming blanks closer to final size so that less material is removed in machining.
- Modifying machining operations to improve the precision of each step.
- Evaluating more efficient processes for operations. Using robotics and automation to carry out many of the handling operations, thereby reducing both human exposure and some of the incidental waste generation and offering opportunities for improved process control and for performing automated chemical analysis in place.
- Improving plutonium recovery technologies to require less chemical usage and produce less plutonium-bearing waste. (p. 184)

Several ongoing waste minimization programs are investigating process changes and recycling: uranium (Y-12; scrap metal recycling, waste separation, recasting/reforming improvements), solvents replacement (LANL, SNL, DOD, KC Plant, others; replacement and reuse of CHC and CFC cleaning solvents), robotics machining of steel parts (SNL, KC plant; increase yield and decrease scrap), net shape forming (LLNL, Y-12; less metal use and machining scrap).

77. Facilities will be designed to recycle the large volume of waste process water they generate, rather than use it "once through." (p. xviii)

    Waste minimization in operation and ultimate D&D is a design criterion in new DOE facilities. Research proposals are being evaluated to modify existing facilities.

78. Only by remediating buried waste in place can DOE fulfill its promise to the Congress and the Nation to prevent passing a negative legacy on to future generations. (p. xvii)

    and

79. DOE will promote technologies to confine and contain groundwater and soil contamination at sites where permanent solutions are not available. (p. 8)

    and

80. DOE will promote bioremediation and other technologies to remediate Comprehensive Environmental Response, Compensation, and Liability Act sites in situ; (p. 8)

    and

81. DOE will promote applied and basic research to discover how Mother Nature remediates herself and, where possible, to help her do this work faster. (p. 8)

    and

82. The future goal of environmental restoration RDDT&E for DOE: to develop methodologies for restoration and support technologies that process the low-value/high-volume contaminant streams, through efficient and cost-effective methods, to high-value/low volume streams easily separated from the environment. (p. xi)

    Many of the projects selected for funding during FY 1990 were focused on soil and groundwater remediation and temporary confinement. It is anticipated that some of the first demonstrations will be focused in these three areas: soil remediation, groundwater remediations, and temporary confinement. DOE has established working groups comprising representatives from national laboratories, field offices, and subcontractors to direct remediation technology areas such as robotics and bioremediation.

APPLIED RDDT&E FOR ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT OPERATIONS (SECTION 2)

1. Applied research will be administered under the Environmental Restoration/Waste Management Program. (p. 48)

   DOE is fostering greater cooperation among the national laboratories by rewarding joint efforts. An example of one of the activities funded for FY 1990 as a joint effort includes the integrated R&D demonstration for groundwater pumping and treating methods that is currently being conducted at Savannah River. DOE has also established a working group comprising DOE and national laboratory representatives to provide the interface between basic and applied research. Proposals submitted to EM that were determined to be basic research were given to Energy Research for inclusion in its programs. Applied research will be conducted by EM.

2. Facilities and procedures will be developed for waste handling and minimization. (p. 59)

   and

3. DOE will establish a centralized oversite office and coordinate a complexwide program to meet the increased environmental chemical analytical requirements. (p. 58)

   These activities are being pursued by the Laboratory Management Branch of the Program Support Division in OTD.

4. To enhance and maintain the essential communication between the phases of basic and applied research, a "Basic/Applied Research Working Group" will be formed during the first quarter of FY 1990. (p. 49)

   This is described in Sections 1.12 and 5.7 of the FY 1992-1996 Five-Year Plan.

5. Set up a task force to determine DOE analytical needs and develop implementation plans. (p. 59)

The Future Analytical Support Team (FAST) was assembled late in FY 1989 to support the development of the RDDT&E Five-Year Plan. As part of its continuing mission to address analytical issues in support of Environmental Restoration/Waste Management activities, FAST has undertaken a comprehensive study of DOE's analytical needs and the resources available to meet those needs. Detailed questionnaires have been sent to environmental programs, waste management operations, and analytical laboratories throughout the DOE system. These surveys will be followed by on-site visits. A summary report, detailing DOE's projected analytical needs, and providing an assessment of the laboratory resources available to meet those needs, will be prepared during FY 1990. In FY 1991, FAST will utilize the results of the FY 1990 study to prepare a strategic plan for the development and maintenance of analytical resources to support near- and long-term DOE needs.

6. DOE will determine the mechanism of implementation and application of a standardized QA/QC program. (p. 59)

   Under DOE-OTD direction, FAST has initiated design and development of a comprehensive environmental QA pogram. Representatives of EPA are working with DOE to design a DOE-wide program that addresses DOE's unique technical issues and satisfies regulatory agency requirements. DOE's Radiological and Environmental Sciences Laboratory (RESL) will manage the program, and a QA Program Office will serve in a technical support role. A draft program management plan has been prepared, with initial funding slated for FY 1990.

7. DOE will initiate studies to develop a DOE-wide sample tracking, QA, and data reporting system. (p. 59)

   The QA program described in Item 5 will establish DOE-wide standards and requirements for reporting analytical results, quality control data, and QA information.

   This effort will be directed toward standardizing the amount, type, and format of reported environmental data. It will also establish routine reporting requirements for environmental QA data. Development of an electronic DOE-wide reporting system is not within the scope of the QA program.

8. A significant aspect of the DOE analytical QA program will be coordination with EPA to enhance and maintain the current CLP-equivalency situation. This will involve the identification of present CLP-equivalency status and extending this status to other DOE laboratories as needed. (p. 84)

   The DOE Environmental QA Program under development (described in item 6) will provide for the maintenance and expansion of DOE laboratories with CLP-equivalent status. An interagency agreement with EPA is presently being prepared to provide continued funding (FY 1990 and following years) for DOE laboratories to receive CLP quarterly blinds. The analytical needs assessment and strategic plans presented in item 1 will provide the basis for decisions regarding the development of new CLP-equivalent laboratories.

9. A national DOE Environmental Analytical QA Program will be established with the following objectives: (1) ensuring that all Environmental Restoration and Waste Management data be generated or used by DOE are technical, credible, and meet programmatic and regulatory requirements; (2) improving DOE's credibility regarding its commitment to provide high-quality Environmental Restoration and Waste Management programs; and (3) ensuring compliance with all applicable DOE Orders and regulatory agency requirements. (p.84)

   The DOE Environmental QA Program under development (described in item 3) will satisfy each of the listed objectives. A draft program management plan is presently under revision, and the QA Program Plan will be drafted in FY 1990. Current schedules call for development of individual program elements (performance evaluations program, audit program, etc.) through FY 1991, with implementation at the field office level scheduled for FY 1992.

10. The RDDT&E program will (1) develop and maintain regulatory agency interfaces, (2) establish and maintain analytical reference standards, (3) establish systems, (4) develop the DOE Environmental Analytical Methods manual. (p. 85)

    The DOE Environmental QA Program under development (described in item 6) will satisfy each of the listed objectives.

    Representatives of the EPA have been involved in planning meetings to establish scope and direction for the QA program and will continue to support the program during its development and implementation. Plans call for analytical reference standards to be addressed by the DOE reference laboratory. The reference laboratory will be selected in FY 1990. Development of a DOE Methods Manual will be a major activity of the QA program, with a first draft scheduled for release early in FY 1992.

11. DOE will ensure that the selected remediation methods will be capable of meeting all relevant CERCLA, RCRA, NEPA, AEA, OSHA requirements, DOE Orders, and applicable State and local requirements. (p. 50)

    and

12. DOE's new OTD will continually support near-term RDDT&E activities to mitigate or solve existing problems according to milestones mostly set by Federal, State, and local regulations or embodied in interagency agreements. (p. 10)

and

13. To meet treatment standards for mixed waste, DOE will provide information and data to assist EPA in deciding which leaching method will be used, either the Extraction Procedure Toxicity Test or the Toxicity Characteristic Leaching Procedure. (p. 170)

DOE is establishing mechanisms for addressing regulatory compliance and public involvement on a parallel path with technology development. For example, regulatory requirements will be key criteria for determining whether an R&D activity will be funded during the DT&E phase and whether a DT&E activity will move to applications. OTD is supporting milestones set in regulations and interagency agreements by selecting RDDT&E projects that are focused on determining solutions to the problems addressed by those milestones. By considering regulatory requirements throughout the technology development process, the selected remediation methods will be capable of meeting all relevant regulatory requirements during remediation.

14. To support Environmental Restoration, Waste Management Operations, and RDDT&E programs, environmental analytical chemistry methods and facilities will be developed and qualified. (p. 47)

Environmental analytical chemistry methods are being developed, but new facilities have not been started.

15. The RDDT&E strategy for Environmental Restoration will include the following:
    - Develop technology to identify and characterize DOE facilities and provide the data base necessary for selection and prioritization of sites and technologies. (p. 50)
    - Develop technologies that can be demonstrated in the next 2 years to remedy the high-priority problems in the next 5 years. (p. 50)
    - Develop technologies that can be put in the field in the next 5 years through RDDT&E to remedy the problems requiring remediation after 5 years. (p. 50)

Site prioritization has commenced, with Rocky Flats and Fernald being assigned top priority.

Technology assessments are being conducted, with promising technologies, such as cryogenic stabilization receiving priority for the short-term (2-year) remedy.

16. The RDDT&E program will support development of detection technology for long-term monitoring of restored sites. (p. 51)

Detection technology for long-term monitoring of restored sites and other applications is an area where ADSs have been received. Joint interest programs between RL and ID have identified this as a focus area.

17. RDDT&E for Waste Management Operations will focus on technology to produce acceptable waste materials compatible with disposal requirements and to produce a minimum of secondary waste also requiring treatment and disposal. Technology will be developed to (1) prepare high-level liquid waste for processing, (2) produce a solidified glassy-ceramic material from already calcine waste, (3) treat waste arising from ER activities, and (4) ensure permanent disposal in a manner that avoids costly, repetitive retrieval and management. (p. 55)

"Acceptable" waste materials are being defined. Alternative treatment solutions in many cases already exist, such as INEL calcining operations.

18. RDDT&E for waste minimization will focus on technology for (1) complex materials substitutions, (2) process modifications, and (3) recycle processes. (p. 57)

Waste minimization activities include teaming relationships with industry (Boeing) and other agencies (USAF) to evaluate solvent substitution.

19. Methodology to relate facility characterization and forecasts of waste generation volumes will be developed. (p. 69)

A methodology to relate facility characterization and forecasts of waste generation volumes will be forthcoming as D&D activities are identified.

20. New technology will be developed to meet the unique challenges to characterize underground single-shell storage tanks.

Ongoing interagency work is under way to deal with underground storage tank issues. An initiative is under way to provide States with insight into technology and assessment capabilities. INEL and Idaho State Department of Commerce are pursuing such an initiative through the Technology Transfer Branch.

21. DOE will develop new analytical procedures for specific radionuclides and for complex inorganic mixtures and specific inorganic/organic substances. Automated sample processing facilities and automated analyses will be developed and constructed. Demonstrable and acceptable QA/QC will be established. A DOE environmental analytical methods manual will be prepared.

Joint development between RL and ID in the area of analytical procedures has been initiated.

22. Technologies will be developed in the following areas for use in overall DOE site assessments involving multiple sites for remediation:
    - General modeling for field-scale predictions of multimedia transport, for use in screening sites and initially prioritizing technology, (p. 90)
    - Single-phase contaminant migration models applicable for all potentially significant pathways, (p. 91)

- Extensions of existing modeling capabilities or development of new capabilities to include standardized models on multiphase phenomena, complex aqueous species, and the transformation and/or degradation of contamination, (p. 91)
- Validation of new and existing models. (p. 91)

Transport models are being developed involving multiple sites where characteristics of those sites are comparable.

23. Technologies for remediation of landfills will be supported as necessary to (1) establish characterization protocol for potential risks from infectious wastes, hazardous/radioactive wastes, and radioactive and explosive gases; (2) prioritize sites; (3) support the identification and implementation of corrective measures if appropriate. (p. 113)

Landfill remediation is under way at several DOE facilities. In some instances the materials placed in landfills are not well documented, which complicates characterization and prioritization.

24. New technology will be developed to meet the unique challenges for the disposal of wastes in USTs and the surrounding soil contaminated by leaks. (p. 116)

UST remediation programs are under way at all DOE facilities.

25. Robotic systems will be developed for D&D of radioactively and chemically contaminated structures to minimize the exposure of remediation technicians and to speed up the D&D process. (p. 134)

A National Robotics Program has been established under the auspices of OTD.

26. Methodologies for screening and selecting potential technologies and assessing their risks will be developed under RDDT&E program support. (p. 51)

and

27. Risk management and performance assessment methods will be standardized, validated, and linked with sampling and analytical methods to ensure that valid data are acquired using established procedures with needed accuracy while minimizing collection of unnecessary data. (p. 47)

and

28. The risk assessment methodology will be coordinated with the Environmental Restoration and Waste Management Operations programs to work toward a standardization of a suite of models that can be used by RDDT&E, Environmental Restoration, and Waste Management Operations programs. (p. 60)

and

29. A simplified risk management assessment and systems engineering model will be developed that provides a national perspective in selecting needs for RDDT&E and remediation technologies. Its use will allow optimization of technology selection, elimination of unnecessary parallel RDDT&E, and coordination of national efforts. (p. 89)

and

30. The details will be included in a risk management plan. (p. 89)

and

31. DOE will develop techniques to assess uncertainty. (p. 92)
and

32. The DOE-specific ecological exposure model will be integrated into an overall risk management methodology. (p. 98)

and

33. A performance assessment development plan will be prepared to coordinate the approach. Options for codes and models will be screened, evaluated, coordinated with Environmental Restoration and Waste Management Operations programs, standardized, and made available for use. (p. 91)

and

34. DOE will establish a performance assessment development plan to provide details on the standardization, calibration, and validation of approaches for application and implementation within the RDDT&E program.

Preliminary planning has begun for a workshop to determine OTD initiatives in risk assessment.

35. The highest priority in support WMO will given to waste minimization and associated treatments. (p. 55)

The highest priorities for applied RDDT&E will be given to waste treatment. (p. 13)
Waste minimization technology development is highlighted in the Five-Year Plan and given status equal with waste operations and environmental restoration.

36. Equipment used in waste processing will be designed for cleaning with nonhazardous substances and/or to yield a nonhazardous product.

A total system assessment of facility and process design will be conducted to identify technologies that will minimize the waste produced and also to minimize worker exposure and hazards. (p. 190)

Conceptual design for alternative tritium production reactors, fuel design, and reprocessing to minimize waste generation will be developed. (p. 191)

A "design for minimization" philosophy for new facilities and products is being established throughout DOE and is discussed in Section 1.16 of the FY 1992-1996 Five-Year Plan and Section 1.5 of the 1989 RDDT&E plan. The new Five-Year Plan makes use of nonhazardous materials when possible with a goal of R&D in waste treatment.

37. Systems will be developed for the safe handling and decontainerization of hazardous gases for identification of the components and for the treatment or detoxification of the gases, including oxidizers, corrosives, pyrophorics, and toxins. (p. 171)

This is a recognition of a technical need, not a commitment. Three related projects have been funded:
(1) disposal of leaking hazardous gas cylinders;
(2) scrubber absorber for VOCs from solvents;
(3) control of acid gas and heavy metals from incinerators.

38. Solidification techniques that meet the LDR treatment standards for radwastes contaminated with heavy metals will be developed. (p. 171.)

This is a recognition of a need, not a commitment. Funded ADSs are: (1) AL410B, Preparation of sludges, salt, and ash for disposal, and (2) CH107, Conversion of reactive metals to a stable form for land disposal.

39. DOE will minimize environmental impacts and costs by initiating recycling programs and treating sanitary, infectious, and biological wastes to reduce volume and toxicity. (p. 174)

A goal of 50 percent reduction in the volume of sanitary wastes by 2000 has been established in the DOE Five-Year Plan.

40. Once improvements are identified, the comprehensive RDDT&E waste minimization program at each site will be defined and prioritized as an augmentation of that site's existing WMIN plan. (p.180)

RDDT&E Technologies will be defined for WMIN based on information in the process waste assessments (PWAs). (p. 180)

PWAs, linked to the DOE complexwide waste reporting system, will identify waste-generating activities that are high-payback areas for waste minimization action or R&D. A PWA has been used at the Y-12 site to identify areas for process improvements in uranium processing.

41. Waste generation will be minimized by conducting R&D on plutonium processing operations to maximize both plutonium component manufacturing and plutonium recovery yields. The improved processes will also minimize environment, safety, and health impacts; reduce manufacturing costs; improve manufacturing quality; and reduce total disposal for reprocessing costs. (p. 184)

Fully remote/robotic facility design of plutonium processing operations and process selection to maximize recycle of process chemicals for minimization of waste generation and personnel exposure will be evaluated.

Ongoing uranium waste minimization activities at Y-12 have some application to plutonium operations. Actions have been taken at Rocky Flats to reduce waste generation from plutonium processing/reprocessing. A joint program between RFP and SNL to integrate robotic manufacturing techniques into manufacturing operations using plutonium is under way.

42. With the assistance of new instruments, administrative changes, and source segregation, LLW and TRU waste will be reduced. Two options are recycling stainless steels and refining lead and silver. Each option will be evaluated. (p. 188)

Source segregation of sanitary, hazardous, and radioactive waste streams to prevent the creation of mixed, LLW, and TRU waste is being pursued by programs at Y-12 and Rocky Flats.

43. A program to investigate and extend technology that might have a significant impact on the collection and retrieval of tritium gas will be prepared at the various facilities using tritium. (p. 190)

A program to reduce tritium contamination of wastewater is under way at the Savannah River Site.

44. Chloride volatility processing of Navy fuel to minimize the volume of high-level waste and produce a low-level waste containing fuel alloy materials will be pursued. (p. 191)

Zirconium cladding is currently dissolved with hydrofluoric acid, and the matrix is dissolved with nitric acid.

45. Postclosure compliance monitoring will be designed to demonstrate that site remediation has been successful and to ensure that any contaminants that have been immobilized in place are safely contained. (p. 138)

Many of the projects selected for funding during FY 1990 were focused on soil and groundwater remediation and temporary confinement. It is anticipated that some of the first demonstrations will be focused in these three areas: soil remediation, groundwater remediations, and temporary confinement. DOE has established working groups comprising national laboratories, field offices, and subcontractors to direct remediation technology areas such as robotics and bioremediation.

46. The RDDT&E program will emphasize two areas: (1) analytical needs will be identified and requirements

will be prioritized and (2) the potential for developing a common architecture for laboratory robotic systems will be evaluated in collaboration with the National Institute of Standards and Technology (NIST). In addition, a group of experts will be identified to evaluate DOE's capabilities in relation to state of the art. The long-term objective is to automate standard methods for hazardous, mixed, and radioactive waste. A long-term (5-year) plan for automation will be developed. (p.73)

Each field office has received funding to support the Robotics Working Group. This group is in the process of identifying the entire complex's analytical needs, current capabilities and capacities, and needed analytical methods for R&D. The working group is also developing a robotics program plan for environmental restoration and waste management activities and establishing the baseline information for determining the RDDT&E needs associated with robotics.

47. For cases where evaluation of site concludes lack of practical near-team technology and an urgency in resolution, functional requirements for interim confinement will be developed along with technology options. (p. 51)

Interim confinement measures such as vapor vacuum extraction and cryogenic stabilization are being demonstrated.

48. Functional requirements will be prepared and technology options evaluated and prioritized. (p. 51)

ADSs are being reviewed and funded consistent with functional requirements.

EDUCATION NEEDS (SECTION 3)

1. An annual meeting on outreach will be held to exchange ideas and present and discuss the status of the program. (p. 205)

DOE is establishing new partnerships with universities and other educational institutions to develop new and enhanced undergraduate and graduate curricula in disciplines pertinent to its environmental restoration and waste management activities. Each field office is in the process of establishing "partnerships" with their regional universities. Some sites have formed university consortia and have had meetings with the universities directed at developing areas of joint research and development.

2. The DOE will establish programs throughout the educational system directed toward meeting its EM needs. (p. 194)

The program framework that has been developed has been structured to provide a comprehensive and integrated set of activities that cover the entire education spectrum. Another factor in the framework development was the fact that the Educational Program Development budget is very modest in relation to the overall Federal budget in science and mathematics education, and very modest in relation to the overall need. In recognition of this, the framework has been structured to provide the greatest payback in terms of meeting EM personnel needs, specifically targeting technician development at 2-year institutions as well as the university research arena. The EM mission is used to the maximum extent possible to encourage and support general science, mathematics, and engineering education, but the emphasis is on human resource development to meet the needs of EM.

3. DOE is committed to a broad outreach program that goes beyond university-laboratory partnerships. (p. 195)

To further enhance the concept of technology development in a partnership atmosphere, OTD is developing program planning and implementation documents in the categories of Education Curriculum and University Participation, National Technology Transfer (including interagency cooperation and industry involvement), and International Technology Transfer. To facilitate the development and implementation of these planning documents, working groups and committees are being formed with representatives from DOE, DOE laboratories and contractors, other federal agencies, industry, and universities. The program planning and implementation documents will stress the planning and implementation of interagency cooperation, information exchange, and communication to avoid duplication of effort.

4. DOE is fully committed to involving people from all parts of society in the Environmental Restoration and Waste Management Operations program. (p. 197)

DOE remains committed to this goal. The participation of STGWG and the Stakeholders' Forum in preparation of the Five-Year Plan Update is one example of progress. Another will be the presentation of Five-Year Plan information in conjunction with other meetings in an attempt to elicit input from a broader community.

RDDT&E FUNDING PLAN (SECTION 5)

1. Additional FY 1990 funding will be made available to enhance the existing Research, Development, and Demonstration Programs administered under Hazardous Waste Remedial Actions Program (HAZWRAP). (p. 233)

The first annual symposium for RDDT&E for Environmental Restoration and Waste Management Operations will be held in mid-December 1989. (p. 236)

DOE has planned a number of efforts for involving private industry in seeking and implementing solutions by developing a draft request for proposal process directed at eliciting R&D involvement by private industry. It is also in the process of developing a draft

request-for-proposal process for demonstrating, testing, and evaluating private industry technologies at DOE sites. The First Annual Symposium for RDDT&E and additional DOE meetings, barriers to private industry participation in DOE's environmental restoration and waste management activities were identified. The draft request for proposal processes will be used as "case studies" for development solutions to the identified barriers.

2. Based on a formal and rigorous needs assessment, a call for proposals will be released from the OTD to DOE Operations Office. (p. 236)

   and

3. To improve Environmental Restoration and Waste Management Operations RDDT&E programs, a number of projects and studies will be undertaken in FY 1990. (p. 223)

   The external peer review process for involving the National Academy of Sciences and other national and international expert bodies and professional societies is being developed. Mechanisms for involving these peer groups in the various RDDT&E activities are being defined.

   DOE has initiated a process for formally and rigorously identifying and prioritizing RDDT&E needs. The "roadmap" process has been initiated, and the process is currently being "tested" at Rocky Flats. The FY 1990 call for proposals by the OTD was based on the needs identified in the RDDT&E Plan. Other projects and studies are being conducted by DOE to improve RDDT&E programs. For example, robotics workshops have been held.

4. The National DT&E technical support office, HAZWRAP, will hold annual workshops attended by Operations Office for identifying and tasking needed demonstrations. (p. 236)

   and

5. Proposed DT&E projects will be reviewed, and requests for detailed proposals and project plans will be issued to field offices for promising demonstration projects following the workshop. Again, proposals including industry and universities will be encouraged. (p. 236)

   The HAZWRAP needs assessment information was reviewed by the Five-Year Plan Task Force. Ranking meeting for activities was held in February 1990.

6. To aggressively pursue the accomplishment of the 30-year cleanup goal, there will be 11 new initiatives for FY 1990. (p. 226)

   Many of the projects selected for funding during FY 1990 focused on soil and groundwater remediation and temporary confinement. It is anticipated that some of the first demonstrations will be focused in these three areas: soil remediation, groundwater remediations, and temporary confinement. DOE has established working groups comprising national laboratories, field offices, and subcontractors to direct remediation technology areas such as robotics and bioremediation.

7. OTD will actively seek promising technologies being developed by other agencies for foreign countries for application to DOE problems. Funds will be ear-marked specifically for joint funding. (p. 237)

   Within OTD, Division of Technology Integration, a program plan for national and international technology transfer and information sharing is being developed. As an integral part of this plan, a formal methodology for technology sharing and communications among other Federal agencies, the States, and all DOE sites is being developed for implementation.

8. Nine new initiatives will be undertaken for RDDT&E in FY 1990 to improve Waste Management Operations. (p. 230)

   - **A "design for waste minimization" philosophy is emphasized in the new DOE Five-Year Plan. Coordination between the DOE/EM cleanup program and the DOE/DP Modernization, Weapons Production, and Nuclear Material Production programs has begun but needs to be extended to the staff level.**
   - **Catalyzed electrochemical plutonium oxide dissolution (CEPOD) has been researched at Hanford.**
   - **CEPOD technology is applicable to other heavy metals. No research activity at is taking place at this time.**
   - **A comprehensive program in depleted uranium waste minimization has begun at the Y-12 site.**
   - **OTD has initiated a project in stainless steel LLW recycle at INEL.**
   - **A reporting/tracking system for baseline waste flows is being established. Initiatives in process waste modeling of a site's manufacturing operations are ongoing at LANL, SNL, and Y-12.**
   - **Segregation of the radioactive component of mixed waste streams is in the demonstration phase at Y-12 (uranium) and Rocky Flats (plutonium).**
   - **DOE will comply with the EPA Land Disposal Restrictions. Reduction of waste at the source and segregation of radioactive and hazardous waste streams are the primary tools for mixed waste management.**
   - **A DOE-wide program to replace CHC and CFC solvents in manufacturing operations is in place. Some design changes have been made in the W88 Trident II program. Process changes have been designed for uranium manufacturing and reprocessing.**

9. HAZWRAP will conduct a needs-based workshop for industry and university participation. (p. 236)

   HAZWRAP is supporting, in conjunction with OTD, a "Subsurface Monitoring of Groundwater Workshop," April 3-5, 1990.

RESPONSES TO COMMENTS MADE TO FY 1991-1995 FIVE-YEAR PLAN AND DRAFT APPLIED RDDT&E PLAN

RESPONSES TO COMMENTS: POLICY

ISSUE 1

COMMENT: The plan is incomplete and does not go far enough to ensure that its ambitious goals will be achieved.

RESPONSE: DOE agrees that the first Environmental Restoration and Waste Management Five-Year Plan is not as good as it could possibly be, but we do think it is an excellent first step. We hope to improve the update now in progress and look to our reviewers to provide guidance on where improvement is needed.

ISSUE 2

COMMENT: The plan does not contain enough detail on DOE's management reorganization.

RESPONSE: At the time the first Five-Year Plan was written, the need for reorganization of DOE's waste programs was recognized, but only the major steps had been identified. The reorganization has been accomplished and is presented in detail in Section 1.6 of the current update.

ISSUE 3

COMMENT: The plan lacks detail on how State, Tribal, and public participation will be implemented. Specifically, what does DOE mean by public participation, will groups participate in the preparation of ADSs, and will public hearings be held?

RESPONSE: The commitment to participation by States, Tribes, and the public is "new culture" for DOE. The details of how this is to be accomplished continues to evolve as the experience with the process is gained. In general the role of the States, Tribes, and public will be to review and comment on the national plan. There is merit to involving these groups in preparation of ADSs and similar up-front activities at the local level, the results of which contribute to the national plan. Public hearings are not anticipated for the plan.

Defining public participation is difficult because the intent is to be inclusive, rather than exclusive, but limits to time, effort, and budget must be recognized. Availability of plans for public comment, notice of intent to prepare environmental impact statements, and public scoping meetings are announced in the Federal Register. Public meetings in communities near DOE facilities are advertised in newspapers in the area. DOE will be pleased to receive suggestions for additional ways to involve the public.

ISSUE 4

COMMENT: How does DOE intend to increase the accountability of its contractors? DOE should withhold Award Fees from contractors cited for any violations of environmental regulations in any given year and reward excellence in waste management.

RESPONSE: The level of accountability/responsibility of DOE's contractors is determined by their contracts. The Secretary of Energy has informed the heads of DOE's M&O contractors of his intention to increase the level of their accountability and liability. Such changes will necessitate changes in the M&O contracts and will include provisions for using the award fee to reward or punish contractors for performance on environmental issues. In general, contractors wish to be "grandfathered" for actions before their contract terms that may lead to current or future violations. Contractors will require a larger Award Fee Pool (i.e., potentially larger Award Fees) if their risks are increased. These changes were described in the Federal Register of January 26, 1990.

ISSUE 5

COMMENT: Are the planned increases in spending sufficient to perform presently identified work and meet the 30-year goal?

RESPONSE: The Five-Year Plan is being used for budget planning, and the expenditures planned will meet the task planned for the same period. Expenditures are expected to rise as sites move from the assessment to cleanup stages.

ISSUE 6

COMMENT: DOE's problems will last longer than the present Administration. Legislation is needed to mandate several aspects of the plan, including outside review.

RESPONSE: The key legislation for DOE's Environmental Restoration and Waste Management programs already exists in the form of the various environmental laws, including RCRA and CERCLA. While those laws prescribe what DOE will do, how DOE will accomplish it is a matter for the Administration to decide. Each Administration must set its own priorities in response to the problems with which it must deal.

ISSUE 7

COMMENT: How are comments from States, Tribes, and the public handled?

RESPONSE: Comments on the Environmental Restoration and Waste Management Five-Year Plan are reviewed by members of the task force assembled to write the plan. Comments affecting the content of the plan are addressed as soon as practicable, during a revision of the plan, if possible. Comments having a major impact on the plan's organization and content

and those arriving after the publication of the final version will be addressed in the next update. All comments received will be addressed, and a comments/response section will appear in each subsequent update.

Comments on the site implementation plans will be handled in a similar manner, although slight differences may exist between the various Operations Offices. In any case our aim is to maintain honest and open communication with the States, Tribes, and the public.

ISSUE 8

COMMENT: DOE should drop attempts to get uniform national standards, but attempts to resolve conflicts in legislation are acceptable.

RESPONSE: **DOE recognizes that States have a statutory right to establish regulations that are more stringent than those established at the Federal level under certain delegated programs. DOE will not only abide by those regulations, but will attempt to abide by other State and local regulations for which there has been no waiver of sovereign immunity. DOE cannot comply with such regulations if doing so would constitute violation of other Federal laws and regulations.**

ISSUE 9

COMMENT: A 30-year goal is not enough--DOE should take the necessary steps, including legislation, to guarantee completion within 30 years.

RESPONSE: **The goal of full compliance and cleanup within 30 years is an ambitious one and cannot be guaranteed. There are several instances where no satisfactory method exists to clean up specific sites. Technological breakthroughs will be required before a cleanup is possible. DOE's Technology Development Program is addressing these issues. While the current Congress and Administration place a high priority on cleaning up the environment, such may not always be the case. The current Congress and Administration cannot guarantee the performance of future Congresses and Administrations.**

ISSUE 10

COMMENT: DOE should assess and report all releases of contaminants to the environment and evaluate the health effects of such releases.

RESPONSE: **We agree. Releases are routinely reported, and public health risk assessments will soon become routine, also.**

ISSUE 11

COMMENT: DOE should sign written agreements with the two Tribes establishing their role in the Five-Year Plan.

RESPONSE: **DOE has no objection to signing an appropriate written agreement.**

ISSUE 12

COMMENT: DOE should provide up-front funding to States and Tribes for oversight and regulatory activities related to facilities.

RESPONSE: **Various mechanisms exist whereby the States can fund regulatory oversight through funds collected from the regulated community. DOE is currently funding the Tribes' participation in the Five-Year Plan and Prioritization methodology. Modification of these arrangements is always open to discussion.**

ISSUE 13

COMMENT: Corrective Activities should not be prioritized because budget constraints do not justify noncompliance.

RESPONSE: **Corrective Activities are no longer being prioritized, even as Priority 1. DOE will comply with all applicable laws and regulations as quickly as possible.**

ISSUE 14

COMMENT: A single appropriation for cleanup that can be carried over fiscal years is a good idea, but compliance needs should be met by reprogramming, if necessary.

RESPONSE: **The single appropriation account is intended primarily to carry out multiyear Environmental Restoration cleanups but may also be needed for large-scale Corrective Activities. Having such a funding mechanism would reduce the need to reprogram funds and would provide for better management by the Administration and better oversight by Congress. Maintaining compliance of operating facilities is the responsibility of the programs operating the facilities and is budgeted by them. DOE will reprogram funds, if necessary.**

ISSUE 15

COMMENT: Budgets developed without State regulator input may be insufficient for environmental restoration and compliance.

RESPONSE: **DOE agrees. The budgets contained in the Five-Year Plan are built up using Activity Data Sheets submitted from the field offices that contain commitments made to State regulators.**

ISSUE 16

COMMENT: Will review of projects under the National Environmental Policy Act (NEPA) delay cleanups?

RESPONSE: **No. Sites that require an immediate response will be stabilized as quickly as possible without waiting for a detailed NEPA review. For the majority of sites for which a more orderly assessment and prioritization will be done, the NEPA review will proceed concurrently and integrally with the planning for cleanup.**

ISSUE 17

COMMENT: Will DOE change its management structure to bring Corrective Activities under one line management?

RESPONSE: **DOE has reorganized to place all Corrective Activities related to Waste Operations under a single line management within the Office of Environmental Restoration and Waste Management (EM). Corrective Activities related to environmental compliance other than Waste Operations will remain with the organization having responsibility for compliance, but they will be monitored by EM and will appear in the EM budget.**

ISSUE 18

COMMENT: Model Interagency Agreements (IAGs) should integrate RCRA and CERCLA and give the States a significantly stronger role.

RESPONSE: **There are two types of model IAGs: those for active facilities having waste release sites and those for inactive facilities. Only those at active facilities come under the jurisdiction of RCRA, in which case the cleanup may be done under RCRA. In practice, the regulators usually determine whether the cleanup will be done under RCRA, CERCLA, or both. The role played by the States is prescribed by law. RCRA and CERCLA both have waived sovereign immunity allowing the States to regulate agencies of the Federal government.**

ISSUE 19

COMMENT: DOE needs to open its contracting to new companies with innovative ideas.

RESPONSE: **DOE agrees. DOE's Management and Operating (M&O) contractors are selected by competitive procurement. DOE encourages all qualified companies to bid on these contracts. In addition, competitive procurements are done for waste site cleanups, Corrective Activities, construction, research, development, and demonstrations. In many instances, proposal of innovative approaches is among the selection criteria.**

ISSUE 20

COMMENT: Using contractors with full capabilities of turn-key cleanup is more efficient than using a series of contractors for the various stages of a cleanup.

RESPONSE: **DOE does not agree that such must be the case, but acknowledges that often it is. Contracting strategies must vary according to the specific conditions at a site and may or may not include a turn-key contractor.**

ISSUE 21

COMMENT: DOE needs to change its culture from pro-nuclear to pro-environment.

RESPONSE: **DOE does not consider the two to be mutually exclusive. DOE must remain pro-nuclear; that is its mission as defined by the Atomic Energy Act. The Atomic Energy Act also sets out a mandate of protecting human health and the environment. Where DOE's culture needs to change, and is changing, is in becoming environmentally proactive and seeing its mandate for human health and the environment as integral to its overall mission.**

ISSUE 22

COMMENT: Establishment of a near-term response fund and a remediation appropriation account would lead to less congressional control and less Agency responsiveness.

RESPONSE: **DOE does not agree. The remediation appropriation account at the Department of Defense, the Defense Environmental Restoration Account (DERA), has not lessened congressional control nor has it led to less Agency responsiveness. Instead, it has provided DOD with a strong basis for environmental restoration planning with active Congressional oversight and improved compliance. What could be more responsive?**

ISSUE 23

COMMENT: The Five-Year Plan needs to provide outyear cost projections for each program.

RESPONSE: **As a strategic planning document with a five-year planning horizon, the plan establishes a budget for the planning year with outyear estimates for the remaining four years. Total program cost estimates would necessarily be based on incomplete data and assumptions that are prone to change. This is especially true for Environmental Restoration, where waste site discovery and assessment are continuing. New sites are being discovered, and the remedial investigations/feasibility studies are collecting the data on which budget estimates will be made. Cost estimates beyond the current planning horizon are subject to frequent revision as more data become available and would not be very valuable at present.**

ISSUE 24

COMMENT: What prior plans have been developed by DOE and what is the status of them?

RESPONSE: **The issue is addressed in the Foreword (p. ix) of the Environmental Restoration and Waste Management Five-Year Plan.**

ISSUE 25

COMMENT: The prioritization methodology should account for both large, complex, long-term projects and smaller, less complex sites where remediation can be carried out quickly.

RESPONSE: **The prioritization methodology development program currently being carried out includes these objectives.**

ISSUE 26

COMMENT: The priority categories used in the Five-Year Plan are inadequate.

RESPONSE: The prioritization system used in the Five-Year Plan is temporary and will be replaced by the prioritization methodology under development when it is available. See Section 1.10.

ISSUE 27
COMMENT: The Research and Development emphasis is too near-term; significant developments can easily take longer than five years.

RESPONSE: Long-term research and development (R&D) are assigned to the Office of Energy Research in the Department of Energy. EM conducts applied R&D focused on identified problems. While such R&D emphasizes that which produces near-term results, DOE recognizes that such an approach cannot be followed to the exclusion of other approaches. Thus, longer-term R&D is also carried out. See Section 5.0

ISSUE 28
COMMENT: Has the FUSRAP schedule been cut by 30 years, from a 2050 completion to a 2020 completion?

RESPONSE: FUSRAP is part of Environmental Restoration and, therefore, has the same 30-year goal for cleanup.

ISSUE 29
COMMENT: Tribes seek a government-to-government relationship with DOE consistent with the policy stated by former President Reagan.

RESPONSE: DOE's relationship to Tribal governments is established by treaty, law, and public policy. DOE will honor those commitments.

ISSUE 30
COMMENT: Recognition of Tribal authority for Tribal lands.

RESPONSE: It is DOE's policy to recognize Tribal authorities consistent with treaty, law, and public policy.

ISSUE 31
COMMENT: Health and safety issues must be addressed during the implementation of the Five-Year Plan.

RESPONSE: DOE agrees. Excluded from the Plan are the oversight functions of the Office of the Assistant Secretary for Environment, Safety and Health (EH).

ISSUE 32
COMMENT: The Superfund Amendments and Reauthorization Act (SARA) requires worker training. This was not addressed by the Plan.

RESPONSE: Providing worker training is implicit in DOE's commitment to comply with all applicable laws and regulations.

ISSUE 33
COMMENT: DOE should immediately initiate worker health surveillance programs.

RESPONSE: Worker health monitoring has been part of DOE's occupational health program from the earliest times. The data have not been generally available to independent researchers, but now will be, according to DOE's Federal Register notice of November 17, 1989.

ISSUE 34
COMMENT: The independent oversight function of the Assistant Secretary for EH has been undermined by the new organization.

RESPONSE: DOE does not agree. In fact, the new organization frees resources within EH for improved oversight.

ISSUE 35
COMMENT: The Tiger Teams duplicate the work of previous EH environmental surveys.

RESPONSE: DOE does not agree. The Tiger Teams are building on and expanding the information collected by the EH environmental surveys and collecting information specific to programmatic efforts to achieve cleanup and compliance.

ISSUE 36
COMMENT: The proliferation of DOE plans, strategies, classifications, terminology, teams, and bosses creates a difficult environment for achieving the goals for environmental responsibility.

RESPONSE: It is true that there has been a proliferation of responses to DOE's environmental needs. The new Office of Environmental Restoration and Waste Management has been created to provide integrated line management that will allow a "corporate approach" to cleanups and compliance.

ISSUE 37
COMMENT: Budget presentations do not clearly indicate what is new money, what is renamed money, and how much more is actually being spent.

RESPONSE: The purpose of the budget information in the Five-Year Plan is to plan for funding the activities of the plan.

ISSUE 38
COMMENT: DOE must use stronger language in its commitments to agreements and on its commitment to environmental priorities over production.

RESPONSE: DOE has used strong language, both in stating that agreements with regulators will be sought as the means for bringing facilities into compliance and in placing environmental performance ahead of production performance in Cost Plus Award Fee contracts.

ISSUE 39

COMMENT: How Is DOE's cultural change to be accomplished?

RESPONSE: Changing the culture of a large, established organization is more easily promised than accomplished. DOE is doing both. Just making the public commitment is an obvious first step and has produced measurable results. Yet, old habits die hard, and we cannot expect people to make drastic changes to their thinking without assisting them. DOE will employ a multiprong approach that includes information dissemination campaigns, formal training, rewards and recognition, and performance planning and evaluations for employees. DOE and its contractors will be made to clearly understand what is expected of them and will be held accountable for their actions.

ISSUE 40

COMMENT: DOE needs to prepare a Programmatic Environmental Impact Statement for the Five-Year Plan.

RESPONSE: Secretary of Energy James D. Watkins announced January 12, 1990, that DOE will prepare a Programmatic Environmental Impact Statement for the Five-Year Plan.

ISSUE 41

COMMENT: DOE must use more conservative assumptions about programs and initiatives. It must include contingency planning for failure to meet goals, such as providing interim storage for transuranic wastes if the Waste Isolation Pilot Project cannot receive wastes on schedule.

RESPONSE: Schedules included in the Five-Year Plan are based on the best estimates that program and field offices can produce. However, contingency planning will play a bigger role in the Five-Year Plan.

ISSUE 42

COMMENT: Several important DOE organizations are not included in the Five-Year Plan or else have plans that are inconsistent with the Five-Year Plan.

RESPONSE: The Environmental Restoration and Waste Management Five-Year Plan specifically incorporates waste operations, cleanup, and research and development formerly conducted by the Assistant Secretaries for Defense Programs and Nuclear Energy and by the Office of Energy Research. Among the DOE facilities and programs not covered by this plan are those of the Naval Reactors Program; the Assistant Secretary for Fossil Energy; the Assistant Secretary for Environment, Safety and Health; the power marketing administrations; and the Office of Civilian Radioactive Waste Management.

ISSUE 43

COMMENT: DOE should coordinate development of its prioritization system with other Federal agencies.

RESPONSE: DOE agrees that a single prioritization system for Federal agencies is a worthwhile goal. DOE has immediate needs for a prioritization system and has committed to use of such a system in conducting its cleanups. DOE continues to discuss the concept with other Federal agencies, and, at such time that developing a common prioritization system becomes possible, DOE will be pleased to participate.

ISSUE 44

COMMENT: There is an apparent lack of integration between the various levels of five-year planning.

RESPONSE: There are two levels of five-year planning: the national Five-Year Plan and individual site implementation plans. The national Plan comprises policy, program, and budget information at a summary level. Program and budget information for the national Plan are developed at Headquarters based on activity data sheets (ADSs, project descriptions including budget needs) submitted by the field organizations. The site implementation plans are then developed from approved ADSs by the field organizations. Consequently, there should be close agreement between the national Environmental Restoration and Waste Management Five-Year Plan and the site implementation plans. The 1989 plans were the first five-year plans to be done by this method, and inconsistencies no doubt exist. DOE expects that correlations between the two types of plans will improve in 1990 and subsequently.

ISSUE 45

COMMENT: Industry participation is essential to a successful Technology Development Program.

RESPONSE: DOE agrees.

ISSUE 46

COMMENT: DOE should ask an external advisory group to review critical cleanup issues such as contractor liability, conflict of interest, technology transfer between industry and government, and lessons learned in cleanups at other Federal sites.

RESPONSE: The suggestion is excellent and will be given serious consideration.

ISSUE 47

COMMENT: The Five-Year Plan should include a discussion of DOE's Quality Assurance (QA) Program and how external parties may participate.

RESPONSE: The suggestion is a good one. A discussion of QA is discussed in Section 1.6.1 in the current update.

ISSUE 48

COMMENT: The Five-Year Plan should include a map showing the locations of DOE facilities covered.

RESPONSE: The suggestion is a good one. A map of affected DOE facilities will be included in the current update.

ISSUE 49
COMMENT: DOE should comply with Nuclear Regulatory Commission (NRC) regulations for radioactive materials.

RESPONSE: DOE has no statutory authority to accept regulation by the NRC. DOE can, and does, structure its internal Orders for radioactive materials management to be consistent with NRC regulations, when appropriate.

ISSUE 50
COMMENT: DOE should make site investigations a priority to identify potential impacts to health and safety.

RESPONSE: Site investigations are a priority for DOE. DOE has completed Preliminary Assessment/Site Inspections at all identified environmental restoration sites and has begun its Remedial Investigation/Feasibility Studies. Environmental Surveys have been completed by the Office of the Assistant Secretary for Environment, Safety and Health at operating facilities and have been followed by Tiger Teams at many facilities.

ISSUE 51
COMMENT: The Commonwealth [of Kentucky] would like to be able to discuss with DOE all future plans for the handling, treatment, and storage of low-level waste onsite before it becomes a problem offsite.

RESPONSE: DOE is committed to free and open discussion of its activities and plans with all affected State and local governments. These discussions include not only permitted activities, but any other activities that have a potential for affecting public health and the environment, such as defense low-level radioactive waste management.

ISSUE 52
COMMENT: Cleanups are being hampered by history of poor documentation, data quality, and record keeping.

RESPONSE: It is true that past record keeping and the quality of available data are not what is needed, and these problems have made the job of doing site assessments more difficult. Data and analyses contribute to protecting workers and the public from near-term potential health risks and contribute to ongoing assessments and cleanup and are, therefore, Priority 1 in the Plan.

ISSUE 53
COMMENT: Job security should be provided for veteran employees who have knowledge of past practices and waste sites.

RESPONSE: The comment is well taken. Because of the quality of records and data at many sites, veteran employees are a primary source of information for site assessments and investigations.

ISSUE 54
COMMENT: The Five-Year Plan strategy aims to make the Savannah River Site its "model" or "flagship" site and achieve "excellence" in waste management and cleanup activities.

RESPONSE: Neither the Environmental Restoration and Waste Management Five-Year Plan (DOE/S-0070) or the Savannah River Site plan made such claim.

ISSUE 55
COMMENT: DOE should carefully integrate its "modernization" and "cleanup" programs.

RESPONSE: The DOE modernization and environmental restoration programs are carefully coordinated but are not integrated. DOE recognizes the benefits that come from incorporating environmental compliance into the design and construction of new facilities and is doing so in the modernization program. Integration of the two, large, important activities could possibly result in inadequate attention given to one or both, and DOE must do both well.

ISSUE 56
COMMENT: DOE should resolve conflicting directives and regulations that continue to produce uncertainty among Federal employees and contractors about their potential civil and criminal liabilities.

RESPONSE: DOE has the objective of full compliance with all environmental laws and regulations. Federal employees and contractors who knowingly violate those laws and regulations are rightly subject to civil and criminal liability. DOE's past practice of full indemnification of contractors has been under review, and a new proposal was published in the Federal Register January 26, 1990. The purpose of this new approach to indemnification is to motivate contractors to be more environmentally responsible.

ISSUE 57
COMMENT: DOE must be forthright, candid, and objective in determining what is and what is not appropriate for inclusion in the new "environmental" budget.

RESPONSE: As DOE's budget planning document, the annual Environmental Restoration and Waste Management Five-Year Plan will make a full disclosure of "what is and what is not" included.

ISSUE 58
COMMENT: Great care must be taken by the Department in implementing the plan and associated activities because of the current social environment surrounding DOE.

RESPONSE: DOE agrees.

RESPONSES TO COMMENTS: ENVIRONMENTAL RESTORATION

ISSUE 1

COMMENT: It's essential that BASEC be consistent with ADSs.

RESPONSE: **The Department agrees that the priority prescribed for activities described by an ADS must be consistent with that determined from the priority system in use, whether the four-factor system used on an interim basis for the August 1989 Five-Year Plan or the BASEC concept now under development for use in the future.**

ISSUE 2

COMMENT: DOE already has a simple and meaningful system for hazard evaluation to the biosphere developed by LLNL and expanded by EG&G Idaho. It uses a four-factor formula: toxicity, availability, lifetime, and toxicity effect of products of radioactive decay or biodecay. The public can relate to this system, and scientists can calculate the four factors in varying degrees of complexity. Consider this system as an alternative to an expensive new prioritization system.

RESPONSE: **A great many risk ranking systems, both simple and complex, have been suggested by a number of individuals and organizations. However, in keeping with its stated policy to comply with the intent as well as the letter of applicable requirements, the Department believes it must use a technique that is consistent with the guidance set forth by the EPA in such documents as the "Superfund Public Health Evaluation Manual" and the "Superfund Exposure Assessment Manual." Although the four-factor system suggested by the commentor provides a degree of measure of the risk posed by contamination and is consistent with EPA guidance, the Department's experience indicates that other factors enter into the equation for developing a priority listing of activities. Examples of such factors include regulatory requirements, public concern, and cost. These additional factors are being evaluated by the Department in consultation with interested external groups, including other Federal agencies, affected States, governmental and public interest groups, and Indian Tribes in developing an effective and acceptable prioritization system for environmental restoration activities.**

ISSUE 3

COMMENT: Unilateral administrative orders assigned Priority 3 and consent orders assigned Priority 2 is an unjustifiable discrepancy.

RESPONSE: **The priority definitions for environmental restoration in the Five-Year Plan assign agreements to Priority 2. The intended purpose of this grouping of compliance requirements is to highlight commitments for remediation that the Department has specifically agreed to. Because Consent Orders typically contain provisions to bring sites into compliance that the Department and the regulators have negotiated and subsequently agreed to, they are placed in Priority 2. Both Priority 2 and Priority 3 reflect regulatory compliance requirements, and assignment to one or the other of these categories does not necessarily imply greater or lesser importance.**

The simple four-tiered system in the Five-Year Plan is interim and is being totally revised. A new priority system for the environmental restoration component of the Five-Year Plan is being developed in cooperation with States/Indian Tribes, other Federal agencies, and national interest groups. This new priority system will include additional criteria for prioritizing needs for Environmental Restoration and will be expanded to cover other components of the Five-Year Plan (e.g., waste management operations) subsequent to its application to ER. The new system will be applied to the FY 1992 budget development.

ISSUE 4

COMMENT: It isn't possible at this time to determine if DOE is requesting adequate overall ER funding. Has DOE done an analysis on the rate of ER spending compared to its 30-year cleanup goal? If not, how does DOE intend to do such an analysis? Such an analysis should be part of future five-year planning and should include the input of relevant regulatory agencies.

RESPONSE: **The Department has not performed an analysis of its current rate of environmental restoration funding in comparison to a hypothetical total cost or total time needed for cleanup. For reasons given below, the Department does not believe it appropriate or possible to do so at this time. In Section 3.1.3 of the August 1989 Five-Year Plan, the general scope of the cleanup problem is described. In Sections 3.1.2 and 3.1.4, the Department indicates that it intends to follow the prescribed approach to cleanup mandated by appropriate regulations and signed agreements in identifying, planning, and executing its cleanup activities.**

Although DOE attempts to develop accurate cost estimates in order to request adequate funds for carrying out Environmental Restoration activities, it is agreed that areas of considerable uncertainty exist with regard to such costs. The cost and funding schedule of DOE's cleanup of its installations is strongly dependent on the requirements, extent, and nature of individual cleanup actions that comprise the Environmental Restoration program. Cost estimates reflect the degree to which the aggregate of engineering and remedial work connected with specific sites progresses, becoming more detailed and precise as work proceeds.

The Environmental Restoration of DOE's installations is in a comparatively early stage of implementation. Although many cleanup actions are under way, the major fraction of current specifications concerning the nature, extent, amount of contamination, required technology, and specific cleanup actions are based,

generally, on data derived from ongoing site assessments. Consequently, most current Environmental Restoration cost estimates should be considered to be projections based on what has been learned from as yet incomplete characterization of known sites. Such projections reflect only partial technical data, assumptions concerning significant cleanup needs, and possible methods of accomplishing cleanup tasks.

Based on the results of ongoing Environmental Restoration assessment and cleanup work, DOE continually updates its estimates of cost and its corresponding schedule of needed funding. Such cost updates are to be reflected in the annual revision of the Five-Year Plan to which relevant regulatory agencies provide input.

ISSUE 5

COMMENT: The Five-Year Plan fails to acknowledge that the increase in proposed environmental spending in the Five-Year Plan largely reflects accounting procedures rather than new funding commitments. The consolidation of Environmental Restoration activities and related change in accounting procedure can be positive, but the following "troubling" aspects must be addressed in future plans:

1. Explicitly acknowledges the massive shifting of activities and recategorizations.

2. Projects shifted to environmental budget categories should be legitimate environmental projects and not maintenance or modernization of production facilities.

3. Adequate funding for environmental protection and cleanup must be based on compliance with Federal and State law and not subject to any kind of prioritization system. In the event of funding shortfalls from Congress, DOE must rely on rebudgeting from other nonenvironmental programs.

4. When legitimate environmental budget projects are recategorized from outyear materials production budgets, there should be a demonstrated decrease in materials production budget categories equal to the amount shifted.

RESPONSE: The August 1989 Environmental Restoration and Waste Management Five-Year Plan sets forth the consolidated planning basis for dealing with regulatory compliance, waste management, environmental cleanup, and RDDT&E with respect to the Department's nuclear facilities and sites. Its scope encompasses DOE's major nuclear program areas of Defense Programs, Nuclear Energy, and Energy Research.

The overall funding schedule included in the Plan for Environmental Restoration (1) sets forth the FY 1989 program execution budget appropriated by the Congress, (2) identifies FY 1990 requirements and the President's amended budget, (3) establishes baseline requirements for FY 1991 budget formulation, and (4) sets forth a projection of annual funding requirements through FY 1995. This funding schedule is characterized by the following:

1. **Although identified as to source major nuclear program area, the amounts do not represent merely a rollup of Defense Programs, Nuclear Energy, and Energy Research budgets, but, on the contrary, reflect consolidated projections of actual assessment and cleanup need.**

2. **The amounts set forth are solely concerned with Environmental Restoration activities and do not include amounts connected either with maintenance or with modernization of production facilities.**

3. **The funding amounts are intended to support fully the Department's policy to conduct all its operations in full compliance with the letter and spirit of applicable Federal, State, and local health, safety, and environmental statutes.**

Although the Secretary has reset the Department's priorities to reflect environment, safety, and health as more heavily weighted than production, funding limitations are a way of life and can arise as a result of congressional action, Administration budget policy, competing national priorities, or needs of other Departmental programs that the Department is obligated by statute to carry out. Accordingly, the Department believes the development of the National Priority System called for in the Plan to be of crucial importance to efficient planning and execution of Environmental Restoration activities. Because of the potential for funds limitation and other resource (e.g., people) limitations, it is likely not all waste sites can be cleaned up immediately. A methodology for setting priorities to replace the simple four-tier prioritization scheme used in the Five-Year Plan is needed to increase the potential for improved health, safety, and environmental protection that may be derived from more effective allocation of a limited amount of funds among competing Environmental Restoration activities. Although it is too early to speculate on its final form, such a methodology will likely include consideration of factors connected with public health and safety, regulatory compliance, current and future State, Indian, community, and public concern, as well as probable cost.

However, the National Priority System will be useful only if developed through a credible process. Apart from the technical aspects of developing such a methodology, the key challenge is to secure broad participation in its development process and agreement concerning its principal features from a disparate group of affected parties--States, Indian Tribes, local communities, and other responsible public interest groups. Each must be a significant

party in the development of the system and must <u>ultimately agree</u> on the factors to be included and the weight to be given such factors.

ISSUE 6

<u>COMMENT</u>: It's EPA policy that issuing a ROD under CERCLA is equivalent to an EIS or EA under NEPA. DOE should use this approach.

<u>RESPONSE</u>: It is the Department's position that it must comply with the provisions of the National Environmental Policy Act (NEPA). DOE Notice 5400.4, Integration of Environmental Compliance Process, was issued for the purpose of integrating the requirements of NEPA with the planning and environmental review procedures of the CERCLA Remedial Investigation and Feasibility Study (RI/FS) process. The RI/FS process sets forth the results of site characterization, provides an assessment of alternative remedies for site cleanup, recommends a preferred remedy, and culminates in the ROD that formally identifies the remedy approved for use. The ROD forms the basis for remedial design and for carrying out cleanup action. The RI/FS process will be supplemented to the extent necessary to meet the procedural and documentational requirements of NEPA. In addition, the public review processes of CERCLA and NEPA are combined for RI/FS-NEPA documents. Approval levels for RI/FS-NEPA documents will parallel those levels required for NEPA documents set forth in DOE Order 5440.1C, the National Environmental Policy Act, and other Departmental NEPA guidance (e.g., SEN-15). The intent in integrating these processes is to ensure that the RI/FS process, culminating in the ROD, meets NEPA requirements and is, thereby, essentially equivalent to NEPA.

ISSUE 7

<u>COMMENT</u>: ALARA is regulatory requirement for the commercial nuclear industry, and DOE should adopt it.

<u>RESPONSE</u>: ALARA (As Low As Reasonably Achievable) is a phrase and acronym used to describe an approach to radiation exposure control or management whereby the exposures and resulting doses to individuals are maintained as far below the specified limits as economic, technical, and practical considerations will permit. It is a regulatory requirement set forth in NRC's proposed modification of 10 CFR Part 20 and, for offsite release, in Appendix I of 10 CFR Part 50. DOE has, in fact, adopted ALARA principles with respect to its nuclear operations. DOE Order 5480.11, Radiation Protection for Occupational Workers, provides that (1) exposure to radiation resulting from DOE operations be maintained within limiting values and as far below such limiting values as reasonably achievable and (2) documentation of plans and programs be maintained to ensure that such radiation exposures are maintained as low as reasonably achievable.

Furthermore, the Department is developing standards and requirements for protection of the public and the environment against undue risk from radiation in connection with Departmental operations. Draft DOE Order 5400.XX, Radiation Protection of the Public and the Environment, provides for adoption of the ALARA process in planning and carrying out all Departmental activities.

ISSUE 8

<u>COMMENT</u>: Discussion of COCAs doesn't specifically mention that authorized States may issue unilateral orders.

<u>RESPONSE</u>: Numbered paragraph 4, Section 3.1.6 of the Five-Year Plan states, among other things: "Under RCRA an approach is set forth....in....a Consent Order Compliance Agreement between DOE and State <u>or</u> [emphasis added] EPA authority." The intent here is to recognize that authorized States, indeed, may issue COCAs.

ISSUE 9

<u>COMMENT</u>: Worker health and safety should be mentioned in Section 3.1.3. Existing policy statements in this section aren't consistent with the decision to appeal the Fernald agreement.

<u>RESPONSE</u>: As stated in Section 1.1, the scope of the August 1989 Five-Year Plan does not include the Safety and Health Program carried out by the Department. This program, carried out under DOE Order 5480.1B, Environment, Safety, and Health Program for Department of Energy Operations, encompasses "those DOE requirements, activities, and functions in the conduct of all DOE and DOE-controlled operations that are concerned with ...limiting the risks to the well being of...operating personnel...to acceptably low levels... . Typical activities and functions related to this program include, but are not limited to, the following: environmental protection, occupational safety, fire protection, industrial hygiene, health physics, occupational medicine, process and facilities safety, nuclear safety, emergency preparedness, quality assurance, and radioactive and hazardous waste management."

Thus, <u>all</u> activities of the Department, including Environmental Restoration activities, are required to be planned and conducted in accordance with health and safety requirements that include workers. Furthermore, the Fundamental Goal of the Environmental Restoration program, as stated in Section 3.1.2 of the Five-Year Plan, cites the elimination or reduction to safe, prescribed levels of risk to human health and safety. It is not intended that this risk elimination or reduction be limited exclusively to offsite populations, but that it includes workers as well.

ISSUE 10

COMMENT: Revision to DOE models used to assess radionuclide migration and risk is needed. Revision should include facts known from DOE's own monitoring information, such as SR plutonium migration into groundwater in the presence of solvents in as little as 20 years.

RESPONSE: DOE agrees that, where possible, risk modeling results should be compared to monitoring results as a way of validating the applicability of such models. A recent report by Pacific Northwest Laboratory is an example of just such an analysis involving the enhanced Remedial Action Priority System (RAPS) methodology (see Whelan, et al., "A Demonstration of the Applicability of Implementing the Enhanced Remedial Action Priority System (RAPS) for Environmental Releases," October 1989, PNL-7012).

It should be noted that information and data on specific mixtures and synergisms between radionuclides and chemical mixtures with respect to transport are rarely available, and even if such data exist, they are often difficult to use. This is the case not only for DOE sites and facilities but also for private-sector Superfund sites. To deal with such uncertainties, reasonable conservative assumptions that will tend to overestimate the potential for contaminant transport are often made. Regulatory guidance for such analysis will be followed and can be found in "Guidelines for the Health Risk Assessment of Chemical Mixtures" (EPA, 51 FR 34014 September 24, 1986) and "Risk Assessment Guidance for Superfund" (EPA, OSWER Directive 9285.7-01a, September 1989).

ISSUE 11

COMMENT: DOE rejects national sacrifice zones in certain undefined circumstances. When does DOE consider in-place stabilization appropriate?

RESPONSE: DOE does not endorse the use, nor the implication, of the term "national sacrifice zone." As stated in the Five-Year Plan, the Department is committed to Section 3.1.1 of the goal of cleanup of all of its inactive sites and facilities within 30 years.

It is DOE policy that all inactive facilities and sites be returned to a condition suitable for unrestricted use. However, in certain instances, as specified in Section 3.1.2, in-place stabilization and disposal may be determined to be the most environmentally acceptable alternative. The circumstances under which an in-place remedy would be considered or selected are likely to be site specific. Therefore, more definitive general criteria are not appropriate. In those circumstances in which in-place stabilization is selected as the best cleanup strategy, that decision, in the majority of situations, will be made by the appropriate regulatory agency. When such decisions are to be proposed or made by the Department, they will be made with the full knowledge and acceptance of the appropriate regulatory agency.

ISSUE 12

COMMENT: Wording in the Five-Year Plan indicates that DOE feels certain about the disposition of waste by type. Given events at RFP when DOE improperly classified waste, how does DOE intend to deal with this issue (for example in cleaning up buried wastes at INEL that DOE believes are TRU waste)?

RESPONSE: Waste classification is a tool used by the Department to facilitate waste operations planning and implementation. It is recognized that waste classification is not a substitute for waste characterization, which is a key element of the regulatory compliance process for site remediation. Waste classification as it relates to the environmental restoration of DOE sites and facilities is a useful piece of information, useful as a point of departure intended as an aid in more efficient and effective waste characterization as part of the regulatory process.

ISSUE 13

COMMENT: The Five-Year Plan should address TRU waste buried at certain facilities by predecessor agencies before 1971.

RESPONSE: In Section 3.1.3, Extent and Nature of Needed Cleanup, of the August 1989 Five-Year Plan, it is stated that the amount of pre-1970 buried TRU waste is estimated to be approximately 192,000 cubic meters, much of which is located at inactive sites and is, therefore, within the scope of Environmental Restoration. Pre-1970 TRU waste that is not determined to be within the scope of Environmental Restoration is included as an active operational waste management activity in the waste management operations section of the Five-Year Plan.

Assessments under the Environmental Restoration program are currently being conducted to determine the quantity and character of the contamination associated with buried TRU waste. Annual updates to the Five-Year Plan will incorporate this information as the assessments are completed. Additional site-specific information on pre-1970 TRU waste may be found in the individual site supplements to the Five-Year Plan.

ISSUE 14

COMMENT: Make clear how or whether the Five-Year Plan addresses cleanup associated with D&D of existing facilities.

RESPONSE: Decontamination and decommissioning (D&D) activities are part of the Environmental Restoration program and, as such, are concerned primarily with the safe caretaking of the existing surplus (inactive) nuclear facilities until they are either decontaminated for reuse or are completely disposed of. The cleanup or decontamination of existing nonsurplus (active) nuclear facilities to allow them to continue meeting their operational mission is not part of the Environmental Restoration D&D program but is included as an active DOE operational program (e.g., Defense Programs, Nuclear Energy) element. Management of wastes from these activities

is included as an activity in the waste management operations section of the Five-Year Plan.

ISSUE 15

COMMENT: The Utah Plan will take less time and funds to implement than disposal in New Jersey. To date no wastes have been removed from Maywood, New Jersey. Implementation of the Utah Plan should be the responsibility of EPA and NJDEP, including enforcement against the responsible party.

RESPONSE: Under environmental laws such as CERCLA, DOE is required to characterize and remediate sites for which it is responsible. For sites on the National Priorities List, such as Maywood, these regulations require that DOE conduct an RI/FS that will characterize and assess all the waste and evaluate all alternatives for site remediation. In the course of completing the RI/FS process, DOE will evaluate the Utah Plan as it promised it would. All phases of site characterization and remediation alternatives identification and analysis are subject to regulatory agency review and approval. A final decision selecting an environmentally effective remedy will be made by the Environmental Protection Agency and the Department subsequent to the completion of the RI/FS process.

ISSUE 16

COMMENT: DOE should not have a funding problem at the Wayne (New Jersey) Interim Storage Site, which does not have defense waste. The responsible party is known and should be made to clean up the site.

RESPONSE: The DOE Environmental Restoration Program is responsible for remediation activities at inactive facilities and sites formerly under the responsibility of the Nuclear Energy and Energy Research Programs as well as Defense Programs. Therefore, contamination addressed by the Environmental Restoration program is not limited to that associated with the former activities of Defense Programs.

Through the Energy and Water Development Act of 1984, Congress assigned DOE the responsibility of conducting a decontamination research and development project at the Wayne site. In executing its congressional mandate, DOE acquired the site for use as an interim storage location for wastes generated during the cleanup of neighboring properties that had become contaminated due to releases from the processing site. As the property owner, DOE is a potentially responsible party under CERCLA for this National Priorities List site and is required to remediate the site and ensure its proper cleanup under CERCLA. As such, DOE must include funding for the cleanup of this project in its budget to ensure timely remediation of the site.

ISSUE 17

COMMENT: DOE has no credibility in Maywood, New Jersey, where DOE officials cannot be trusted. Maywood has been the victim of lies and deceits.

RESPONSE: It is the intent of the Five-Year Plan to encourage public comment about concerns to assist DOE in dealing with its environmental problems. Frank discussions of current environmental problems with all interested parties is a major ingredient of the Five-Year Plan. It is the intention of the Department that through these discussions, new avenues of understanding can be developed by all concerned and that the Department's credibility with Federal and State agencies, Tribal governments, and the public can be restored. Any methods to improve this communication would be appreciated and should be identified to DOE.

ISSUE 18

COMMENT: Given that Hanford is a highly contaminated site with a high degree of uncertainty on the exact character and quantity of soil contamination, top priority should be given to reducing uncertainty.

RESPONSE: Reducing uncertainty related to contamination of inactive hazardous waste release sites is an ongoing process at the Hanford Site. The uncertainty is being reduced by studying the site through the process of characterization and assessment. This process will determine to the satisfaction of the appropriate regulatory agencies what contaminants exist, what the quantities are, and how the site should be cleaned up. There are many characterization and assessment activities planned or in progress as specified in the Five-Year Plan that will be ongoing in the five-year time frame and beyond. These activities concern well over 1000 separately identified sites at Hanford that have been grouped into 78 larger areas called operable units. There are currently over 50 Activity Data Sheets that were addressed by the Five-Year Plan that detail plans for characterization and assessment activities at Hanford with planned expenditures of greater than $700 million in the five-year time period. These sheets are part of a DOE system of planning, and they form the basis of the work planned and budget required for work at Hanford and other DOE sites.

In addition, Hanford's Tri-Party Agreement (which is an Interagency Agreement within the meaning of CERCLA Section 120, required for sites on the National Priorities list) was approved by DOE, the Environmental Protection Agency, and the State of Washington Department of Ecology in 1989. This agreement covers characterization and assessment as well as cleanup work. The Agreement is a legally binding and enforceable document that establishes milestone dates and work scope to ensure that the necessary work is accomplished and receives high priority within DOE.

Hanford is and will continue to be a top priority within DOE for characterization and assessment of sites followed by appropriate remediation (cleanup) measures. Admiral Watkins has stated on several occasions that Hanford is to be a model site for waste management and cleanup. Hanford Site funding for environmental restoration work is generally the

highest of any other DOE site except for Oak Ridge, Tennessee, which also has special needs.

ISSUE 19

COMMENT: Small amounts of Pu (possibly not hazardous) have been found 100 ft down in the soil at INEL, indicating the disposal site is not functioning as planned. This problem should be mentioned. What else is missing in the Five-Year Plan - surface waters could also be a problem because of runoff.

RESPONSE: **As the comment states, one sample was taken that contained plutonium. It was found at about a 100-ft depth in the inner-bed. The second issue brought up by the comment is surface waters. There is no known surface water problem around the Subsurface Disposal Area. However, interim activities have taken place to control any potential for excess surface water in the disposal area to mitigate the migration of plutonium and volatile organic compounds. These measures will remain in place until remediation of the Subsurface Disposal Area under the CERCLA process.**

These issues did not appear in the Five-Year Plan because that document was intended to give an overview of Idaho National Engineering Laboratory activities. The issues mentioned above appear appropriately in the Environmental Restoration and Waste Management Site-Specific Plan for the Idaho Operations Office. This document is expected to be released in the second calendar quarter of 1990.

ISSUE 20

COMMENT: Characterization of INEL facilities is not complete. Without comprehensive characterization, the list of compliance activities and corrective actions in the Five-Year Plan will be incomplete, and INEL's ranking for funding will be incorrect. Characterization must include consideration of cultural and environmental Tribal needs.

RESPONSE: **Characterization activities at the Idaho National Engineering Laboratory will be ongoing throughout the five-year planning period addressed in the Five-Year Plan. The characterization plans for INEL have been developed in consultation with State and Federal regulators. This is expected to be a continuing process (at the time this is written, the Department is beginning its negotiations with the State and EPA to develop an Interagency Agreement under CERCLA Section 120). If, through this ongoing characterization, additional activities are identified that warrant immediate action, priorities will be reassessed, and the problem will be handled. In addition, necessary activities and priorities are reassessed annually as part of the DOE-Headquarters five-year planning process. This way, activities can be added, modified, deleted, or adjusted upward or downward in priority or funding requirements. These actions will be taken as appropriate as more becomes known about the site through the ongoing characterization process. The Department recognizes that a significant part of establishing priorities that fulfill the regulatory requirements at INEL is the involvement of the State of Idaho, Indian Tribes, and the public.**

ISSUE 21

COMMENT: The Five-Year Plan focuses on contamination at INEL. Offsite monitoring and risk assessments are needed to ascertain offsite impacts to be followed by appropriate restoration activities. For example, monitoring wells and an air quality station are needed at the northern border of the Shoshone-Bannock Reservation.

RESPONSE: **The Idaho National Engineering Laboratory has several monitoring plans and agreements under consideration. Proposed agreement participants include the Shoshone-Bannock, the State of Idaho, and Idaho State University. INEL provides proper monitoring of its activities through independent monitoring, and thorough verification of its adequacy and accuracy will be obtained. The specific needed monitoring locations will be developed by INEL per requirements set by the monitoring plans and agreements.**

ISSUE 22

COMMENT: Clearly state whether oversight funding is included in NV Environmental Restoration funding.

RESPONSE: **Operations oversight funding for remediation activities is not included in the figures set forth in the Nevada Operations Summary included in Attachment B to the Five-Year Plan, nor is funding included in the Draft February 1990 Site-Specific Plan developed by the Nevada Operations Office pending successful conclusion of an agreement between the Department and the State of Nevada. Such funding for State oversight and compliance monitoring would be included in updates to the Five-Year Plan. Funding was not included because an agreement between the State and DOE had not been negotiated. However, oversight funding is expected to be included in the June 1990 Site-Specific Plan to be submitted by the Nevada Operations Office. This funding will assist the State in monitoring site remediation efforts and allow onsite coordination of environmental activities.**

ISSUE 23

COMMENT: OR tables are not complete:

(a) old disposal sites have leaked and spread contamination at White Oak Creek (and elsewhere?)

(b) land disposal is a major unresolved problem.

RESPONSE: **(a) Releases from disposal sites have resulted in contamination of onsite surface and near-surface groundwater. Contaminants have been transported via White Oak Creek beyond the boundary of the DOE Reservation with the resulting contamination of offsite surface waters, including the Clinch River.**

Sampling to determine the extent of contamination in the offsite waters is ongoing. This will assist in determining the potential risk to public health and welfare and to the environment. Data gathered will be used to determine if remediation is required and, if so, the type of remediation.

RESPONSE: **(b) Land disposal of radioactive wastes on the Oak Ridge Reservation has been a part of the waste management strategy since the beginning of operations in the 1940s. The shallow-land burial practices of the past 40 years have resulted in contamination of the disposal sites and in the spread of contaminants offsite into the surrounding watershed. Recognition of this failure in disposal practices surfaced in the early 1980s, and alternative waste management strategies were developed and are now being implemented. The Low-Level Waste Disposal Development and Demonstrations (LLWDDD) strategy now embraced by the DOE-OR facilities involves (1) the segregation of waste into specific waste classes for management that are tied to regulatory-approved performance criteria and that identify wastes that are no longer acceptable for disposal on the Reservation, (2) the development and demonstration of greater confinement disposal (GCD) technologies for disposition of the wastes that provide state-of-the-art disposal methods, and (3) based on the results of the GCD technology demonstrations, construction and operation of full-scale disposal facilities for management of the OR wastes into the next century. The Tumulus and GCD silo technologies are now being demonstrated at ORNL, replacing the shallow-land burial practices of the past. An EIS is being prepared by DOE-OR to outline the overall waste management strategies and to assess the environmental impacts of the construction and operation of these new disposal facilities.**

RESPONSES TO COMMENTS: WASTE MANAGEMENT AND CORRECTIVE ACTIVITIES

ISSUE 1

COMMENT: Although the Five-Year Plan announces DOE's intent to contribute $200 million per year beginning in FY 1991 to the high-level waste repository fund, the burden of the repository cost falls on utility rate payers.

RESPONSE: **Radioactive waste program management and costs of the program are outside the scope of the Five-Year Plan.**

ISSUE 2

COMMENT: "In my opinion, it is not so much production oriented priorities, but a lack of scientific integrity on health safety, and environmental matters and a culture oriented to secrecy which held both the intelligence of people and the democratic process in low esteem."

RESPONSE: **Many DOE facilities have been in operation for over 40 years, while widespread environmental awareness has only developed over the past 25 years. Secrecy, no doubt, played a significant role, preventing many problems from coming to the attention of those who might understand their consequences and initiate action. Nevertheless, DOE is committed to a cultural change that includes open communication; public involvement; emphasis on health, safety, and environmental concerns; and, if necessary, rooting out and eliminating any lack of "scientific integrity."**

ISSUE 3

COMMENT: Misrepresentations and distortions of data continue at other facilities. For example, at the Savannah River Plant in South Carolina, DOE continues to misrepresent its own analysis, claiming publicly that there is little danger of an explosion in tanks containing high-level radioactive waste and that if such an explosion did happen, only a little over 1 gal (out of about 1 million) of radioactive materials would become airborne. As a result, DOE claims there is little danger to the public.

RESPONSE: **The consequences of an explosion in the Savannah River waste tanks have been evaluated and documented in "Safety Analysis - 200 Area Savannah River Plant Separations Area Operations Liquid Radioactive Waste Handling Facilities" (DPSTSA-200-10). Although the consequences of such an event are high, the probability of occurrence is low enough to make the overall risk of continued operation of the waste tanks acceptable.**

ISSUE 4

COMMENT: Improving the quality and quantity of information regarding the nature and extent of the problems at the DOE sites should become a part of Priority 1. This will also require a serious commitment of resources to improving the quality of scientific analyses and risk analyses.

RESPONSE: **It is past record keeping and the fact that the quality of available data is not what is needed that have made the job of doing site assessments more difficult. Data and analyses contribute to protecting workers and the public from near-term potential health risks and contribute to ongoing assessments and cleanup and are, therefore, Priority 1.**

ISSUE 5

COMMENT: A revision is required of the models DOE used to assess radionuclide migration and risk. DOE should incorporate data from its own monitoring programs into its models.

RESPONSE: **Modeling and monitoring are basic elements of ongoing performance assessment activities at all DOE sites. Models are continually being revised to address new information obtained from monitoring of specific pathway and transport mechanisms. For certain regulatory documents, DOE must use the models identified by EPA, even though those models do not adequately represent environmental conditions and transport phenomena. For documents such as environmental impact statements, modeling is used in**

"bounding" the upper limits of consequences and risks. Most of these models use many simplifying assumptions that cannot be validated by monitoring data to obtain a "worst case" analysis of environmental consequence.

ISSUE 6

COMMENT: Priority 1 should also include minimizing risk from catastrophic accidents or releases due to natural phenomena, especially earthquake potential at Savannah River.

RESPONSE: **Studies of the seismic activity in the area surrounding Savannah River conclude that the region is characterized by a relatively slow rate of crustal change. Studies by the U.S. Coast and Geodetic Survey indicate that Savannah River is located in an area where moderate damage might occur from earthquakes. On the basis of three centuries of recorded earthquake history, earthquake intensities greater than VII Modified Mercelli CMM are not expected at Savannah River.**

Onsite earthquake intensities of VII MM could result from an earthquake centered near or slightly west of Charleston and with the same epicentral intensity as the 1886 earthquake. The intensity of the Charleston earthquake at Savannah River was estimated to be about VII MM, or about 0.10 ground acceleration, and is the basis for defining the Savannah River Operating Basis Earthquake. A safety factor was added, making 0.2 ground acceleration the basis for the Safe Shutdown Earthquake, also known as the Design Basis Earthquake. Additional details on seismology and risk associated with earthquake damage at Savannah River may be found in "Safety Analysis - 200 Area Savannah River Plant Separations Area Operations Liquid Radioactive Waste Handling Facilities."

ISSUE 7

COMMENT: DOE has made a premature decision to go directly to vitrification of high-level wastes at the Hanford Site. This is an instance of uncoordinated DOE decision making. Glass may be incompatible with the geology of the Yucca Mountain site, which is DOE's only candidate site for high-level waste disposal.

Since a repository site has not yet been finally approved, and is in any case at least a decade-and-a-half from operation, it is more appropriate to consider a solid waste form which could, in principle, be compatible with a variety of geologic environments. This can be accomplished by first calcining the wastes and storing the powder, as is done at the Idaho National Engineering Laboratory.

RESPONSE: **The decision to vitrify Hanford high-level wastes into borosilicate glass was based on an extensive evaluation of alternate waste forms performed by DOE in the 1970s and early 1980s. The result of this evaluation led to the preparation of an environmental assessment entitled "Environmental Assessment - Waste Form Selection for SRP High-Level Waste" (DOE-EA-0179). Due to similarities between SR and Hanford wastes, a desire to utilize existing technologies at Hanford, and favorable results at SR, borosilicate glass was chosen as the preferred waste form at Hanford. The steps leading to this decision are documented in the "Final Environmental Impact Statement, Disposal of Hanford Defense High-Level, Transuranic and Tank Wastes" (DOE/EIS-0113).**

Studies have been performed and are ongoing to determine the compatibility of borosilicate glass in the Tuff Repository environment characteristic of Yucca Mountain. Results to date on a laboratory scale are favorable. Preliminary modeling of long-term waste package performance has also been favorable. The results of continued testing of simulated Hanford wastes in borosilicate glass show the waste will meet the anticipated specifications for performance in the repository. Continuing studies are expected to confirm the long-term acceptability of vitrified high-level wastes in the repository environment.

ISSUE 8

COMMENT: Recent disclosures have revealed that chemicals were added to the high-level tanks at Hanford, which have created potentially explosives mixtures at the bottoms of 14 or more tanks, under certain conditions. It appears that all of the solutions that have been discussed until now--leaving the wastes in place in the tanks, vitrifying them, or calcining them--might involve some risk of explosions. Examining this question carefully and with integrity and developing options for dealing with the wastes in these tanks that do not expose the public to the unacceptable risk of tank explosions should be a top priority for DOE.

RESPONSE: **The potential for explosion in Hanford's waste tanks, caused by mixtures of nitrates or nitrites with organic compounds or ferrocyanide, has been studied since 1964. The conclusion reached is that the mixtures and temperatures needed for a chemical explosion do not exist in the tanks. Ferrocyanide, which is present in 22 of the Hanford waste tanks, will not react with nitrates or nitrites below 400°F and may react explosively above 550°F. The highest temperature measured in any of the 22 tanks is 135°F. The risk associated with chemical explosion will only decrease as tank temperatures fall due to radioactive decay. Another concern has been the presence of hydrogen in the waste tanks. A study was recently initiated to investigate the potential hydrogen buildup beneath tank crusts in the presence of an oxidizer. The study will assess hydrogen generation, buildup, mitigation, and potential risks. Corrective activities will be initiated based on the study recommendation. Final disposal of the wastes in these tanks is an ongoing challenge. All tanks are being sampled to determine the amount and nature of chemicals present. The results of this sampling will be factored into disposal options, which will be documented in a supplemental environmental impact statement for the disposal of waste in singe-shell tanks. The possibility of explosions during waste retrieval, pretreatment, and solidification operations will be examined as part of the NEPA process.**

ISSUE 9

COMMENT: Schedule is another problem with current waste solidification plans. The Hanford Waste Vitrification Facility is currently scheduled to go on stream in 1999. This is a very lengthy period to continue high-level liquid radioactive waste storage, and its attendant problems such as the risks of tank explosions and all the dangers that they imply. Further, DOE's past history of delays in the waste management program gives little basis for confidence that this schedule will be met. The problem of high-level waste solidification is urgent. The schedule for addressing it should be accelerated.

RESPONSE: **The start-up date of the Hanford Waste Vitrification Plant (HWVP), December 1999, is a major milestone commitment in the Hanford Federal Facility Agreement and Consent Order. This "Tri-Party Agreement," entered into by the State of Washington, EPA Region X, and DOE, provides commitment dates for facility startups, site remediation, site cleanup, and waste disposal operations. The December 1999 startup for the HWVP was the result of arduous negotiations between the three parties. DOE's Environmental Restoration and Waste Management Five-Year Plan provides the funding profile required to meet this milestone start-up date. Efforts are ongoing to evaluate methods to accelerate startup. Until additional studies are completed, the December 1999 date offers the most realistic schedule for the start of vitrification of Hanford high-level wastes.**

ISSUE 10

COMMENT: DOE has also made no commitment stopping the production of further liquid wastes from reprocessing. While reprocessing operations at Hanford are shut down at present, DOE appears set to resume neutralizing wastes and storing them in carbon steel tanks. High-level wastes should not be neutralized, but be immediately calcined or otherwise solidified. Stopping neutralization of high-level waste would minimize the amount of waste which is generated, which is one of the things that DOE has said is among its waste management goals. Further, immediate solidification would minimize waste storage requirements and make such storage much less risky.

RESPONSE: **With the decision to discontinue operation of the N-Reactor at Hanford, reprocessing operations are limited to the backlog of fuel currently being stored in basins. Development of alternate technologies and design, construction, and operation of new facilities to deal with the volume of waste to be generated by future reprocessing at Hanford is not cost effective, timely, or warranted. Technologies are being developed to treat and dispose of neutralized wastes. The double-shell tanks used to store the neutralized waste are monitored and have not leaked to date. The volume of waste to be generated from future reprocessing operations can be handled in existing double-shell tanks. The costs and timing of new technology development and implementation far exceed any potential gains of a change from current storage, treatment, and disposal practices at Hanford.**

ISSUE 11

COMMENT: It is necessary to stop neutralizing high-level waste at Savannah River to minimize waste generation from current and future reprocessing operations. Similarly, it is important to implement immediate solidification of the acid wastes to minimize waste storage and the risks from such storage.

RESPONSE: **Since the Savannah River facility already has a considerable inventory of alkaline waste to be processed, the DWPF processes are designed for alkaline wastes. The DWPF is nearly complete and is scheduled to start nonradioactive, "pilot-plant" runs this year. Changing the DWPF processes to handle acid wastes would delay the start of waste treatment by a number of years, or a facility would have to be constructed to handle the acidic waste.**

Immediate solidification (less than 2 years) of some of the wastes is possible with the current, alkaline processes, but it is undesirable from an environmental standpoint. The SRS waste removal program calls for removing wastes from the early-design tanks as fast as possible, since nine of them have leaked and because the secondary containment for these tanks does not meet current regulatory and DOE standards. This will require storage of newly generated wastes for longer than otherwise necessary; however, all newly generated wastes are sent to type III tanks, which meet all regulatory and DOE standards, and have not leaked. If the scheduling priorities were reversed so that newly generated waste would be processed as fast as possible, this would require storing wastes in the older design tanks longer than otherwise necessary, an environmentally undesirable practice.

ISSUE 12

COMMENT: The Defense Waste Processing Facility is being built on a commercial scale without adequate pilot-scale experience. It should therefore be operated as a pilot plant with corresponding more intensive efforts at instrumentation and monitoring. This needs to be incorporated into the Five-Year Plan.

RESPONSE: **Pilot-scale testing of the vitrification process has been conducted at the TNX Facility at Savannah River and at Pacific Northwest Laboratory. Individual and integrated full-scale pieces of DWPF equipment were tested for acceptance at the TNX Facility. A 15- to 18-month cold run period is scheduled to begin at the DWPF in September 1990. During this time, the DWPF will be operated in a "pilot-scale" mode to facilitate equipment testing and to provide data for waste acceptance process documentation. Hot operations will commence in June 1992.**

ISSUE 13

COMMENT: Long-lived radionuclides should be removed from the low-level radioactive waste prior to the fabrication of Saltstone. This removal should include iodine-129 and technetium-99. An effort should be made to further minimize the amount of mercury that will be incorporated into the saltstone.

RESPONSE: Leach tests have been performed on saltstone to determine the rate at which contaminants will diffuse out of the waste form. Results show that iodine-129, technetium-99, and mercury are released at very low rates. In addition, Extraction Procedure Toxicity (EP-Tox) tests show that the waste form passes. The disposal system (waste form, vault, and cover system) is being designed to minimize the contact of water with the waste form. Preliminary modeling of this system shows that long-term release will be below regulatory limits for radionuclides and hazardous chemicals. Saltstone and the disposal system provide adequate long-term protection to the environment and the public. The technology development and cost associated with removing the relatively small quantities of iodine-129 and technetium-99 from the low-level wastes do not appear necessary.

ISSUE 14

COMMENT: There continue to be unresolved problems in plutonium accounting and in the quantity of plutonium contained in the tanks. This is a highly unsatisfactory situation from a number of points of view--security, safety, environment, quality control, and health.

RESPONSE: Transfers of waste solutions from production facilities are sampled and analyzed for fissile material content (including plutonium) before discharge to the Tank Farm Complex. A continuous, auditable inventory of fissile material is maintained for all applicable double-shell tanks. The recorded inventory of fissile material in the single-shell tanks is estimated based on historical operating records. A more accurate estimate of the inventory in these tanks is being obtained through the Environmental Restoration characterization program, a precursor to initiation of Remedial Action.

ISSUE 15

COMMENT: DOE plans to continue disposing of low-level radioactive waste in landfills. This is a poor choice of technology with a sorry history. Monitored aboveground storage and related approaches are far superior. DOE should evaluate these on an urgent basis. DOE should immediately suspend further disposal of radioactive wastes in dumps (or "near-surface disposal" or "shallow land burial" as the Five-Year Plan puts it).

RESPONSE: No disposal system will ever be completely safe. Aboveground storage provides many distinct advantages for areas with large rainfalls and shallow groundwaters. For arid western sites with deep groundwaters, there are no particular advantages to aboveground systems, and in some instances, several disadvantages.

The problems found at some existing and closed landfills were largely caused from inadequate siting of the landfill and lack of treatment or screening of the wastes being disposed of. These will continue to be the critical items for any disposal or storage system, aboveground or belowground.

ISSUE 16

COMMENT: Although a fee structure giving DOE contractors greater incentives for environmental performance is an improvement over past practice, it does not address the essential inadequacies of the contractor arrangement with DOE in a role of both requiring the fulfillment of both production and health, safety, and environmental goals. DOE should commission a study which evaluates the full range of alternatives to present institutional arrangements for waste management.

RESPONSE: DOE recognizes that the large majority of its work is actually carried out by contractors and that it needs these contractors to complete its missions. The Secretary of Energy has notified DOE contractors of their responsibility to comply with operational, environmental, safety, health, and security standards established by law, regulation, or Departmental policy, while at the same time meeting their production or research mission. He firmly believes that these goals are coequal.

The Department will evaluate your suggestion to commission a study of institutional alternatives for DOE's waste operations. DOE has recently solicited interest from the commercial sector for two waste management initiatives. The first is to evaluate commercial treatment capabilities for radioactive mixed wastes at the Oak Ridge Reservation and the second is to license and construct a commercial storage facility for DOE's transuranic waste. The Secretary of Energy has just completed a major reorganization of DOE, both at the Headquarters and field office levels. This reorganization was done, in part, to address the issues the reviewer raises. We should give this approach time to work. Should the need remain in the future, the reviewer's comment could prove valuable.

ISSUE 17

COMMENT: The Five-Year Plan assumes that both the Waste Isolation Pilot Plant and the Yucca Mountain high-level waste repository will be brought into operation at time frames near the ones DOE anticipates at present.

RESPONSE: The statement is untrue. The Plan anticipates the opening of WIPP, because of the advanced stage of that project, but does not assume success. The Plan also anticipates a repository, but does not assume Yucca Mountain or any time frame.

ISSUE 18

COMMENT: DOE should reevaluate its entire high-level waste program, putting much greater emphasis on the engineered barriers, including the cask relative to the geology.

RESPONSE: We disagree. Instead of relying on engineered barriers, which in historic time frames will fail, the DOE high-level waste disposal strategy is based on deep geologic disposal, which can be counted on to isolate the wastes from the biosphere for geologic time scales.

ISSUE 19

COMMENT: DOE should shift to waste minimization to the maximum extent technologically feasible and to monitor retrievable storage for low-level wastes.

RESPONSE: The Department is already shifting to waste minimization as the normal course of doing business. Formal waste minimization programs are established at all operating sites in response to regulatory mandates as well as DOE's own guidelines. In turn, a separate budget category has been established to account for waste minimization costs and activities.

ISSUE 20

COMMENT: "DOE should discontinue the use of carbon tetrachloride which is highly polluting, very toxic as well as an ozone-depleting chemical."

RESPONSE: DOE is actively pursuing alternatives for carbon tetrachloride and all other chlorinated solvents. Alternative activities include, for example, (1) nonhazardous aqueous solvents/cleaners, (2) liquid carbon dioxide cleaning, (3) plasma cleaning, and (4) design change.

ISSUE 21

COMMENT: There appears to be an inadvertent error in the first line under "Status": Presumably DOE means to reduce and not "enhance air emissions."

DOE needs to correct its methods for estimating releases to the air from the scrubbers at the Feed Materials Center. It also needs to improve its estimates of releases from unmonitored and nonpoint sources. Much better characterization of the waste pits is also needed.

DOE also needs to improve considerably air monitoring the system at FMPC. The current system is very sparse and has a high probability of missing accidental releases that happen over a short period of time.

RESPONSE: The wording under status is unclear. The intent is to reduce air emissions or to enhance the quality of air emissions. The reviewer is referred to the compliance activities summary on page 240 for a summary of improvements to the air monitoring system at FMPC, which include dust collectors, a nitrate/nitrate removal system, new filter system to prevent contaminated air discharges, and improved air stack monitoring activities.

ISSUE 22

COMMENT: DOE should make it clear that low-level waste treatment techniques do not reduce the hazard of the components, but concentrate them into a smaller area.

RESPONSE: The comment is valid, and clarification will be made in the next version of the Five-Year Plan. Treatment of low-level wastes will not reduce or eliminate the radioactive components in the waste, and most treatment methods will result in an increased concentration of radioactivity. However, treatment does reduce the hazards by converting the waste to a more stable waste form. For example, waste oils can be incinerated, producing an ash residue. The radioactivity is concentrated in the ash, and ash is solidified using a concrete or polymer material. By converting the liquid to a solid, the long-term hazards associated with the storage or disposal of these materials is reduced.

ISSUE 23

COMMENT: In considering cases of in situ disposal, DOE should pay particular attention to its policy to comply with all applicable laws, regulations, and requirements as established by EPA, States, Indian Tribes, and local governments.

RESPONSE: DOE recognizes the technical and regulatory complexities associated with in situ disposal and appreciates concerns over the long-term maintenance and the irreversible commitment of natural and cultural resources. It is also recognized that for many of the disposal facilities subject to the provisions of CERCLA and SARA, in situ disposal may be the most reasonable, practical, and safest method for managing these sites. DOE's regulatory compliance policies are stated clearly in the Five-Year Plan and will not be compromised.

ISSUE 24

COMMENT: Will the management scheme for Corrective Activities (p.36) be part of the proposed reorganization? If not, it, should be. This looks like the managerial organization that led DOE to problems it faces today.

RESPONSE: Certain aspects of DOE's approach to managing Corrective Activities were affected by the reorganization such as the Office of Environmental Restoration and Waste Management (EM), which is now responsible for coordinating all Departmental Corrective Activities and for managing the Corrective Activities budget. But more importantly, this approach embodies Secretary Watkins' intent to place DOE managers directly accountable for environmental, safety, and health regulations at their facilities. In this regard, EM is responsible for implementing Corrective Activities at its facilities to the same extent as the other major Program Offices in DOE (e.g., Defense Programs, Nuclear Energy, Energy Research). The management approach to Corrective Activities is explained further in Section 2.1.3 of this year's Five-Year Plan.

ISSUE 25

COMMENT: Environmental Compliance activities should not be in the prioritization system because budgetary constraints are not an excuse for noncompliance.

RESPONSE: DOE agrees that budgetary constraints are not an excuse for noncompliance with environmental regulations. Consistent with this view, the planning basis has been changed for this and subsequent years in that all Corrective Activities (i.e., bringing facilities/operations into compliance) are given a Priority 1. Remediation and waste operation activities will continue to be prioritized on a four-point scale.

ISSUE 26

COMMENT: If waste management operations are those activities necessary to maintain compliance with environmental regulatory requirements, they should not be subject to prioritization for the same reasons that Corrective Activities should not be subject to prioritization. If DOE agrees that compliance with environmental requirements takes precedence over production, then all actions necessary to maintain compliance with environmental requirements should be funded. Actions that enhance DOE's ability to maintain compliance, but are not necessary to ensure compliance, could justifiably fall into a lower priority category.

RESPONSE: Not all of the activities conducted by Waste Operations are necessary to maintain compliance with environmental regulations. In fact, the primary function of Waste Operations is to manage DOE's waste products. This includes such routine activities as waste collection, packaging, transportation, storage, treatment, and disposal. Waste Operations ensures that these activities are conducted in a safe and environmentally protective manner.

ISSUE 27

COMMENT: The "Continuity of Operations" concept is unclear. Will this portion of the Waste Operations program receive outside review and revision?

RESPONSE: DOE agrees. The concept of "Continuity of Operations" was not clearly explained in the Five-Year Plan. This category of work is considered the "base" program for Waste Operations and includes the administrative, planning, and support functions necessary to maintain waste activities at each of the Department's operating sites. A portion of the continuity of operations funding goes toward maintaining regulatory compliance, but a significant share is used to maintain safe operating conditions. Each DOE operating site accounts for their "base" waste management activities under the continuity of Operations category. These include such things as surveillance and monitoring of waste in storage (e.g., liquid wastes in underground storage tanks), facility and equipment maintenance, safety analyses, personnel training, permit applications, strategic and long-range planning, waste sampling and analysis, waste certification, quality assurance, waste information management, and records retention. Construction of new waste management buildings not specifically related to the treatment, storage, disposal, or minimization of waste is also included in this category.

Activities in the Continuity of Operations category are subject to external review and revision to the same extent as all other activities described in the Five-Year Plan.

ISSUE 28

COMMENT: Has DOE made contingency plans for storing transuranic wastes that may accumulate if any of DOE's treatment faculties (or WIPP) fails to open on time?

RESPONSE: DOE is making plans for storing transuranic mixed wastes until WIPP is ready to receive them. The current strategy is to use a combination of eight DOE sites located in seven states for near-term storage of Rocky Flats Plant generated mixed transuranic waste. This was discussed with State representatives at a meeting in November 1989. The waste shipments to those States could begin as early as June 1990, but extensive efforts at RFP to reduce waste volume could, if fully successful, delay the beginning of shipments into 1991. Shipments will continue for approximately 3 years, when WIPP in New Mexico anticipates accepting larger amount of RFP waste for operations testing.

In the event that WIPP is further delayed, then a storage capacity beyond the interim capability offered by these DOE sites is needed. DOE is pursuing several potential contingencies, which include a commercial storage site that would be developed and operated by private industry and a storage site on Department of Defense-controlled property. Both of these alternatives are considered mid- to long-term storage options depending on when WIPP begins operation. These plans will be reflected in the next update to the Five-Year Plan.

ISSUE 29

COMMENT: DOE shall continue to evaluate alternatives to incinerating mixed wastes. How does treatment of mixed transuranic and high-level wastes to meet disposal standards for radioactive components of the waste address issues relate to the hazardous components?

RESPONSE: DOE is actively pursing improved separation/concentration technologies to separate waste into its radioactive and hazardous components, allowing use of existing treatment and disposal options. Technologies currently being researched include, for example, selective absorption or adsorption in liquid, thermal treatment, solvent extraction, evaporation, distillation, absorbing or adsorbing agents, oxidizing thermal process, ion exchange, and selective metal precipitation.

ISSUE 30

COMMENT: DOE should adopt performance standards for waste site remediation that incorporate the assumption of loss of institutional control in environmental restoration activities where radioactive material is concerned. It is not clear that DOE's radioactive waste management guidelines ensure an equal level of protection as compared to current permit requirements, which cover primarily nonradioactive pollutants.

RESPONSE: For disposal of high-level, transuranic, and low-level waste, DOE is directed by performance standards that assume a loss of institutional control. DOE must meet all applicable performance standards for waste disposal prescribed by the EPA and the Nuclear Regulatory Commission. In the case of Environmental Restoration activities, a decision to stabilize a contaminated site and leave it in place will require regulatory approval. This decision will depend on several factors: (1) specific site conditions; (2) the type, nature, extent, and amount of contaminants present; (3) the availability of suitable stabilization technologies; (4) regulatory requirements; and (5) other agreed-to considerations.

ISSUE 31

COMMENT: DOE clearly has to provide processing and interim storage for transuranic and high-level wastes, as well as processing and disposal for low-level and hazardous mixed wastes.

RESPONSE: DOE is critically aware of the need for treatment, storage, and disposal capacity for its radioactive and mixed wastes. DOE is actively pursuing design and construction of new facilities to supply the necessary capacity.

ISSUE 32

COMMENT: The Nevada Division of Environmental Protection is currently seeking an agreement between the State of Nevada and DOE to assist in the remediation oversight at NTS. This funding would assist the State in monitoring site remediation efforts and allow onsite coordination of environmental activities. The State also has an ongoing responsibility in assuring environmental compliance for NTS operations after the bulk of the remediation activities have been completed. The State is therefore concerned that no funds are budgeted beyond 1993 (p. 235).

RESPONSE: The funds and projects discussed in the Corrective Activities section (pp. 234-235) are for currently identified deficiencies in NTS programs or facilities. All currently identified Corrective Actions are scheduled for completion by FY 1993 and, therefore, no additional funds are requested beyond FY 1993. If additional Corrective Actions are identified, funding will be requested and projects incorporated in later versions of the Five-Year Plan. Funding for state oversight, as identified in any agreements between the State of Nevada and DOE, is provided in the Waste Operations section.

ISSUE 33

COMMENT: Nevada Operation Office Summary - (pp. 234-235) The quoted Corrective Activities costs range from $1.1 million in FY 1989 to $2.5 million in FY 1991. It appears that these estimates include the costs for construction of replacement and upgraded facilities, but do not account for remedial activities for closed sites and continued program compliance.

RESPONSE: Corrective Actions are defined as those activities necessary to bring existing operating facilities or programs into compliance with DOE, State, and Federal requirements. These are basically "one time" efforts to upgrade operating facilities. Remedial activities and continued program compliance for NTS are addressed in the Environmental Restoration sections (pp. 284-285).

ISSUE 34

COMMENT: Nevada Installations Summary - (p. 284-285) Types of facilities requiring remediation are identified, but whether or not operation oversight costs are included is not stated.

RESPONSE: Costs associated with project management are included in the budget estimates. Funds that may be provided to the State of Nevada through interagency agreements are not included. A separate request for funds to support State agreements will be prepared upon completion of the agreements and will be identified in future revisions of the Five-Year Plan.

ISSUE 35

COMMENT: Nevada Operations Office Summary - (pp. 340-341) The Plan does not address State's oversight role or the need to possibly expedite some clean-up activities. The report also fails to discuss the unresolved questions that the State has regarding the acceptability of the proposed cleanup and restoration levels. The management of other permitted facilities such as sewage plants, UIC facilities, and other water facilities should also be addressed in this section.

RESPONSE: The referenced section only addresses Waste Management Operations at NTS. The role of States and their oversight responsibilities are discussed in other sections of the Plan. Prioritization of activities and acceptability of cleanup and restoration levels are also discussed in other sections of the Plan but not specifically for NTS or any other single site. It is DOE's intention to address specific state concerns through interagency agreements and the Site-Specific Five-Year Plans.

ISSUE 36

COMMENT: It appears that INEL may be slated to both process and dispose of large volumes of low-level, mixed, and hazardous wastes from other DOE sites.

<u>RESPONSE:</u> **INEL is not slated to receive large volumes of low-level, mixed, and hazardous wastes from other DOE sites. INEL is currently processing wastes that are generated onsite and will develop the capacity to process wastes that are in onsite storage. Because of the current lack of treatment capacity for radioactive mixed waste, DOE may elect to use some of INEL's excess treatment capacity for wastes generated at other DOE sites.**

ISSUE 37

<u>COMMENT:</u> If WIPP expects to open soon, why will transuranic waste be processed and stored at newly constructed facilities at INEL?

<u>RESPONSE:</u> **These processing facilities will be used to treat waste that cannot be certified for acceptance at WIPP as well as waste whose contents are questionable. After treatment, the waste may remain in storage until WIPP is ready to accept waste for permanent disposal.**

ISSUE 38

<u>COMMENT:</u> INEL currently provides processing and interim storage for high-level waste and will be constructing new storage tanks. How much of this storage will be for INEL waste and how much is allocated for waste from other facilities?

<u>RESPONSE:</u> **All of the additional storage capacity is reserved for INEL-generated high-level waste.**

COMMENT 39

<u>COMMENT:</u> TSCA also covers asbestos, which older DOE facilities must contain, although it is not discussed.

<u>RESPONSE:</u> **Activities to ensure compliance with TSCA regulations are included in the Five-Year Plan, but are not highlighted in the narrative portions. Specific examples of asbestos abatement activities are included in the D&D of older, surplus facilities.**

COMMENT 40

<u>COMMENT:</u> Most of DOE's facilities are now faced with the massive tasks of bringing facilities into compliance because DOE did not pay attention to the environmental rules.

<u>RESPONSE:</u> **DOE is committed to full compliance with Federal and State regulations at all of its facilities across the country. However, DOE recognizes that there have been problems, particularly at the older sites built before many of the environmental regulations were promulgated. Among other things, the Five-Year Plan outlines DOE's approach to solving these problems. It provides for assessment of the problems, full disclosures to the State governments and the public, independent reviews, and the necessary corrective actions to bring facilities into and maintain their compliance with the regulations.**

The Secretary is committed to introducing a more proactive, environmentally conscious culture within DOE, as outlined in his ten-point initiative (June 27, 1989). The Secretary's plan is to ensure compliance with both the spirit and the intent of environmental laws and safety and health requirements.

COMMENT 41

<u>COMMENT:</u> OSHA is absent from the Plan, and the DOE position should be stated.

<u>RESPONSE:</u> **DOE is committed to full compliance with OSHA regulations at all of its facilities. The Secretary has reaffirmed his commitment to meeting all OSHA regulations in his ten-point initiative outlined on June 27, 1989. However, meeting OSHA compliance is a safety and health element of the base program for facility operation, which is outside the scope of environment corrective activities in the Five-Year Plan. Those OSHA compliance activities that pertain to waste management operations are included in that section.**

COMMENT 42

<u>COMMENT:</u> The Plan indicates that greater confinement techniques are being considered for noncertifiable transuranic waste. If greater confinement disposal is to be used for the disposal of noncertifiable transuranic waste, some discussion would be appropriate. The term "noncertifiable" should be explained.

<u>RESPONSE:</u> **Valid comment. The term "noncertifiable" is inadequately explained and will be discussed in the next version of the Plan. The use of greater confinement techniques for noncertifiable transuranic wastes is currently being considered at the Nevada Test Site, and a performance assessment in accordance with 40 CFR 191 is being prepared.**

COMMENT 43

<u>COMMENT:</u> The goal of DOE concerning treating wastes should be technologies and techniques equal or superior to current practice. For example, incineration is the current practice, but it is not well received by the public, and it is expensive for hazardous wastes. Rather than accepting this, DOE should seek superior techniques.

<u>RESPONSE:</u> **One mission of the OTD is to rapidly accelerate the development of new technologies to solve the problems of treating wastes and to encourage technology development to improve waste treatment effectiveness, efficiency, and safety. Treatment technologies include, for example, biotechnology, chemical treatment and destruction, and separation techniques such as ion exchange and solvent extraction.**

COMMENT 44

<u>COMMENT:</u> This section indicates that it may not be necessary to immobilize the calcined high-level waste being stored at INEL. Some form of immobilization would be required by transportation regulations, and it seems prudent to avoid serious problems in the event of a transportation or other type of accident.

RESPONSE: DOE intends to comply with all appropriate requirements for packaging, transportation, and disposal of high-level waste. These requirements will apply to the management of calcined high-level waste currently stored at INEL. A decision as to the final waste form for the calcine product has not been made at the present time.

COMMENT 45

COMMENT: DOE indicates it will provide a greater-than-Class-C low-level waste disposal facility as quickly as possible and anticipates such a facility being available about 2010. Twenty years for this seems excessive.

RESPONSE: It is DOE's intention to provide an interim storage location for commercial greater-than-Class-C wastes within the next year. Ultimate disposal of these wastes is currently dependent upon the opening of a high-level waste repository, which was expected to be available by 2010.

COMMENT 46

COMMENT: Aboveground disposal for low-level waste as described in the Plan seems like an oxymoron. Someday, when other uses will be made of Savannah River, such vaults will need further action, and it will be difficult job. Such vaults are really storage facilities as they will need continuous monitoring and maintenance and ultimately some final resolution.

RESPONSE: Use of aboveground vaults or tumuli at humid sites like Savannah River and Oak Ridge may be necessary to meet performance objectives for groundwater protection. While the long-term monitoring and maintenance of these sites may be more costly, there are few alternatives available. While it may be practical to ship these wastes to other DOE facilities located in arid regions, the willingness of State governments and regulatory agencies to accept these wastes is uncertain.

COMMENT 47

COMMENT: The biggest problem with solid low-level waste disposal in DOE, Oak Ridge, is ignored. This problem may be relevant to Paducah with similar geology. Also, there are more cemeteries in this section. If Idaho needs a new disposal site, why wait seven years to begin construction since the location has been known for years?

RESPONSE: Waste disposal at the Oak Ridge Reservation was addressed in the Plan. After the issuance of the Plan, DOE has canceled plans for development of a disposal site at Paducah and Portsmouth. The schedule for development of a new disposal site at Idaho is dependent not only upon DOE and State requirements for assessments and permits, but also the remaining capacity of the existing disposal site.

RESPONSES TO COMMENTS: RESEARCH AND DEVELOPMENT

ISSUE 1

COMMENT:

a. Increasing the budget for research to some arbitrary percentage of the total budget is a good way to waste money. The size of the research budget should reflect the needs of the Department and the quality of proposals.

b. DOE Headquarters personnel are ill-equipped to direct an applied research program. Most of the persons in the waste management groups of DOE Headquarters do not have the technical experience or knowledge to direct a research program. This was the reason these programs were decentralized in the past.

c. DOE only looks outside to connected persons. DOE does not look for new technologies outside the Department. The latest SBIR solicitation seeks no new technology for waste management, remediation, or any related area. How will you get these new innovative technologies if the one government program for this purpose is not used?

RESPONSE:

a. Setting aside a fixed percentage of the total budget to support Technology Development is an interim step designed to initiate the Office of Technology Development. The fixed percentage will not be maintained in the long term.

b. Staffing for the Office of Technology Development is under way and will require supplementing existing DOE/HQ personnel.

c. The Draft RDDT&E Plan describes specific steps toward gaining industrial involvement in the Environmental Restoration and Waste Management technology development activities (pp. 28-29). These efforts included a very well-received national meeting with industry and education persons in December 1989.

ISSUE 2

COMMENT:

a. Some of the technologies being developed by DOE are commercially available, such as detectors for organics, joule-heated ceramic melters, biological treatment for many organics, supercritical water oxidation, and bioreactors.

b. DOE has created many groundwater models and appears to be developing new models without dealing with the real problems. One cannot model soils for which Darcy's equation does not hold.

c. Many new thermal technologies are available. Melters superior to DOE's joule-heated ones are available from more than one source.

d. The sections discuss only DOE's ongoing activities and provide no indication of the process for obtaining the best technology, including sources outside DOE, promised in the summary and objectives.

<u>RESPONSE</u>:

a. DOE does not intend to repeat the development of commercially available technologies. In some cases, the technologies may not be fully ready for implementation. In others, adaptation to DOE-specific problems may be required.

b. DOE recognizes that progress in groundwater modeling rests largely on advances in basic research.

c. It is well known that products are often offered for sale before they have been demonstrated to be effective for the purpose for which they are sold. In fact, some technologies offered to DOE have proven not to work at all when tested at DOE facilities. Testing and evaluation of commercially available technologies is a major role of DOE's Technology Development Program. Demonstration of unproven technologies before commitment to them is just good business.

d. The Draft RDDT&E Plan expands upon means for pursuing technologies beyond the DOE system, in the industrial sector (Section 1.3.2), internationally (Section 1.3.3), and through other Federal agencies (Section 1.3.4).

ISSUE 3

<u>COMMENT</u>: The emphasis of R&D on technologies that can be deployed in the next five years is arbitrary. Rather, a dual emphasis is required. We need to begin now to address the problems of long-term management and cleanup, which will require new technologies both for worker and environmental protection. We also need some technologies on time scales of a few years. Five years is a kind of arbitrary figure that has not been developed in relation to the priorities.

<u>RESPONSE</u>: **Of course, five years is an arbitrary time line, but so would any time line be arbitrary. The point is that the Technology Development Program is intended to emphasize R&D that will address DOE needs in Environmental Restoration and Waste Management rather than to support R&D for its own sake. By drawing attention to the potential for near-term applications, this focus on applied R&D is brought out as a major concern.**

ISSUE 4

<u>COMMENT</u>: Waste minimization should be a major focus of the DOE R&D program. Although waste minimization will require a substantial investment at the outset, it will provide increasingly positive results in the future.

<u>RESPONSE</u>: **DOE strongly concurs with this comment. Waste minimization is a major focus of the DOE R&D program, and a major share of R&D effort is dedicated to waste minimization.**

ISSUE 5

<u>COMMENT</u>: In situ treatment may appear as the least cost alternative in some cases. Extent of permanent alteration or destruction of Yakima cultural and natural resources must be considered when evaluating alternatives for soil and groundwater remediation.

<u>RESPONSE</u>: **Impact on cultural and natural resources is a major consideration when assessing the environmental impacts of a proposed action.**

RESPONSES TO COMMENTS: TRANSPORTATION

ISSUE 1

<u>COMMENT</u>: Several State, Tribal, and special interest organizations commented that the first Five-Year Plan had not provided sufficient information on transportation and had not adequately addressed concerns about safety (e.g., accident prevention and emergency response) or public information and involvement.

<u>RESPONSE</u>: **DOE has added a new Section 6 to the revised Five-Year Plan that provides significant additional information on both existing programs and projected improvements that address the commentors' concerns. For example, Section 6.2.2 covers the emergency response programs and plans. The concerns expressed are the same as or similar to the concerns contained in a Western Governors' Association (WGA) Report to Congress on <u>Transport of Transuranic Wastes to the Waste Isolation Pilot Plant: State Concerns and Proposed Solutions.</u> DOE is currently in the process of finalizing a Cooperative Agreement with the WGA under which the identified concerns can be addressed. DOE intends to enter into similar Cooperative Agreements with other State and Tribal jurisdictions along the corridor from DOE facilities to WIPP. These interactive arrangements are seen as instruments by which DOE can encourage public participation in DOE program decision making and resolution of transportation concerns. More detail on these cooperative efforts is provided in Section 6.4.1.**

ISSUE 2

<u>COMMENT</u>: DOE has had a consistent problem with quality assurance (QA) and should seek certification of its QA plan for transportation.

RESPONSE: **The response is described in three parts, using the example of the proposed shipment of waste to the WIPP:**

1) **QA applied to the waste to be transported**
2) **QA applied to loading and unloading of the waste container**
3) **QA applied to the container.**

1) **THE WASTE: DOE has established Waste Acceptance Criteria (WAC) for the safe handling and long-term disposal of TRU radioactive waste at WIPP. These criteria establish conditions governing the physical, radiological, and chemical composition of the waste to be emplaced in the WIPP. Before any waste shipment departs any generator or storage facility, the shipment will be certified to meet the WAC.**

   The WAC were developed by a DOE-wide committee of experts on the handling and transportation of radioactive material. The basic concepts and limits chosen as WAC requirements are based on personnel safety, handling, and storage restrictions at the WIPP facilities; methods of handling equipment; and procedures.

2) **THE LOADING AND UNLOADING: As part of the design process to ensure that the packaging is as the designer intended, a detailed set of loading and operating instructions is generated. These instructions are part of the Safety Analysis Report for Packaging (SARP) reviewed by the NRC during its certification process. Therefore, to comply with the Certificate of Compliance issued by NRC, DOE must apply QA to both the loading process and the operation of the package.**

   Assembling a TRUPACT-II shipment will involve three steps: (1) preparing each of the waste containers (14 drums or 2 standard waste boxes) in accordance with the specifications in the payload-control procedures, (2) loading the waste container into the TRUPACT-II cavity, and (3) testing the leak tightness of the seals on the outer and inner containment vessels of the TRUPACT-II shipping containers.

3) **THE CONTAINER: In the case of packagings for WIPP shipments, NRC regulations in 10 CFR Part 71 include requirements for implementing a QA program that is used in the design, purchase, fabrication, handling, shipping, storing, cleaning, assembly, inspection, testing, operation, maintenance, repair, and modification of those components of the TRUPACT-II container and NuPac 72B cask that are important to safety. The QA requirements are not optional; they are mandatory.**

The QA program provides a systematic approach to ensuring that a design and the resulting product or service are safe and satisfactory for the intended use. The program is aimed at preventing problems, not only at detecting and solving them.

The QA program is developed and implemented by specially trained full-time employees. The employees report to the highest level of management in their organizations to maintain their independence from concerns about costs or schedules. Their primary function is to make sure that the QA program meets the requirements of the NRC and is effective in producing a product that meets required standards and that will maintain its integrity during operation. This requires ascertaining that all workers are trained and qualified to perform their assigned tasks, all workers are trained to understand the program, and work is properly controlled.

ISSUE 3

COMMENT: The next Five-Year Plan should explain what regulatory authority EPA has over which facets of a nuclear waste transportation system.

RESPONSE: EPA oversees the transport of radioactive mixed waste under the Resource Conservation and Recovery Act (RCRA). The July 3, 1986, Federal Register publication (51 FR 24505) announced EPA's determination that waste containing both hazardous and radioactive contaminants is subject to regulation under RCRA.

EPA has adopted certain DOT regulations governing the transportation of hazardous materials and has incorporated them into RCRA regulations for generators and transporters in 40 CFR Parts 262 and 263. These regulations are primarily concerned with labeling, marking, placarding, using proper containers, and reporting discharges.

RCRA regulations in 40 CFR 262.20 require hazardous waste generators to ship their waste to a "designated facility" that is permitted under RCRA to handle the waste. WIPP will qualify as a permitted facility under interim status before any waste is shipped from any generator facility.

EPA regulations require transporters to obtain an EPA identification number to comply with the manifest system and record keeping and to take immediate action to protect human health and the environment in case of a hazardous waste discharge.

ISSUE 4

COMMENT: Since the Draft Supplement Environmental Impact Statement (SEIS) for the WIPP itself concedes that train transport is safer than sole reliance on truck, why is it that the Five-Year Plan assumes that DOE will rely on the less-safe alternative?

RESPONSE: Because truck transportation of TRUPACT-IIs to WIPP would be conducted under DOE contract and subject to extensive review and audit oversight, DOE expects truck shipment statistics for WIPP shipments to show significantly lower accident, injury, and fatality rates than national averages. DOE believes a higher degree of control over the carrier as well as other factors such as

flexibility of dispatching, halting shipments during severe weather, and vehicle tracking would make TRU waste truck shipments equal to or less risky than rail transport. Historically, shipments of radioactive materials have an excellent safety record, and there is no reason to believe this record will cease to continue.

Since the specific percentage of mode mix between truck and rail is still unknown and depends on many safety, operational, and economic factors, the SEIS analyzes two bounding cases. The first is a 100 percent truck case, and the second is what is termed the "maximum" rail case, or exclusive rail shipment from all those facilities with rail access (8 of 10 facilities) and the remainder by truck. This approach permits the analysis to address any mix of modes that would be finally selected.

The original shipping projections of 75 percent train and 25 percent truck included in the FEIS were based on preliminary estimates that rail would be available to ship from the majority of the facilities. Since that time, studies have indicated that truck transport offers significantly more control over the dispatching, scheduling, and overall transportation management of TRU waste shipments. For these reasons, DOE has elected to use 100 percent truck transport during the proposed Test Phase. In committing to truck transportation for the first 5 years of the shipping campaign, however, the DOE has not eliminated the possibility of rail transportation during the proposed Disposal Phase.

ISSUE 5

COMMENT: The Five-Year Plan has failed to adequately factor human error into its risk assumptions.

RESPONSE: **Human factors as they impact transportation of radioactive materials is a highly controversial topic. Any evaluation of this issue has several considerations. First it must be understood that there are two distinctly different human factor impacts in transportation. First, there is the fact that any time you move something in our transportation system, be it by road, rail, water, or air, human beings will fail to perform perfectly, and there will be accidents. Of importance to consider is the fact that regulations concerning the transportation of radioactive materials cover that aspect quite well. The regulations, which are uniform worldwide, are based upon the assumption that there will be accidents and that those accidents will sometimes be severe. Therefore, the regulations require that the packaging for high-level materials be designed and constructed to provide protection against this most common form of human failure. It was, in fact, consideration of this aspect of human failure that convinced the early framers of the regulations to do everything possible in the regulations to avoid dependence upon human behavior. Thus, the requirement for accident-resistant packaging.**

The other component of the impact of human factors on the safety of transporting radioactive materials deals with how human failures during the manufacture of the packaging or the preparation of the shipment can affect the margin of safety that the designer intended to provide in the packaging. What happens if the shielding is not installed correctly, the wrong heat treat is used on the head bolts, the head bolts are not torqued properly, or the seal is not tested properly are indeed valid concerns. There have been several attempts to study this aspect in the past, notably by two NRC-sponsored studies. The "Urban Study" addressed the question briefly and concluded that it was inconsequential. The "Modal Study" also looked briefly at this aspect of the problem. The conclusion reached in that study was that the probability of consequential human failure during the manufacturing or preparation sequence was so small, by virtue of the QA program, as to be of no significance. A major priority within DOE over the past year has been to examine QA practices and to establish or reinforce program procedures to meet high QA standards.

RESPONSES TO COMMENTS: RDDT&E PLAN

ISSUE 1

COMMENT: One of the barriers to waste minimization is justifying the cost of new technologies to minimize waste or to change processes so that they generate less waste. To justify utilizing new technologies that may be in the demonstration and evaluation phase, we are developing the "true" cost of waste disposal for some of our greatest waste generation problems. This cost will include the long-term liability cost for managing waste disposal caused by soil and groundwater contamination and tougher regulatory requirements for disposal sites.

RESPONSE: **DOE agrees and this point is fundamental in the Five-Year Plan process.**

ISSUE 2

COMMENT: The reviewers sought to evaluate the report's technical plans for radioactive waste management and found that such plans were presented very superficially. The relative importance that DOE gives to managing low- and high-level radioactive wastes was not clear in this report. Presumably, DOE will be issuing more detailed plans for specific technical program areas. NRC's waste management research staff would like to see these plans when they are available.

RESPONSE: **The detail desired will be found in the annual update to the Environmental Restoration and Waste Management Five-Year Plan, which now includes the Technology Development (RDDT&E) plan, and in the site-specific implementation plans prepared by the DOE field offices.**

ISSUE 3

COMMENT: Because of the general nature of the draft report, the reviewers were unable to determine how much DOE plans to apply existing technical information and technology in its environmental restoration program. There are plans for research in several technical areas, for example, hydrogeologic and contaminant plume characterization of radioactive waste disposal facilities, for which much research already has been done for both DOE and NRC. DOE's own Office of Civilian Radioactive Waste Management (OCRWM) has supported such work. However, the report does not cite this work or plans for coordinating environmental restoration research work with OCRWM.

RESPONSE: **The Office of Technology Development has as one of its responsibilities to maintain currency on environmental technologies available for cleanups and other DOE problems. Research will be based on the need for cheaper, better, faster solutions to DOE's problems. If existing technology will satisfy DOE's needs, no research is warranted. Existing technologies may come from other DOE programs, such as OCRWM, other Federal agencies, industry, universities, or foreign nations.**

ISSUE 4

COMMENT: The example used in Section 2.1.7 to draw a distinction between risk assessment and performance assessment may be more suitable for showing similarities between the two types of assessment. The required calculation of radionuclide releases and accounting for the probabilities of events and processes that would cause such releases has many aspects of a risk assessment. The total-release part of EPA's standard, although not expressed in terms of dose, is based on a particular population-dose target. The EPA standard would be better used as an example for showing similarities between risk assessment and performance assessment.

RESPONSE: **DOE appreciates the comment on differences between risk and performance assessment, and this comment is being addressed in the current version of the Five-Year Plan. Section 2.1.7 has now been dissolved and is part of Chapter 5.**

ISSUE 5

COMMENT: Section 2.2.1.1 should acknowledge major activities and accomplishments in hydrogeologic characterization by DOE national laboratories and various international efforts such as INTRAVAL. This section states the technical information needs well, and the specific problems are generally correct. However, the need to examine various hydrogeologic complexities and features for different spatial and temporal scales related to the development and movement of contaminant plumes is critical.

RESPONSE: **The intent of the plan was to outline needs and approaches to solving needs. The acknowledgment of the major activities and accomplishments in hydrogeologic characterization by DOE national laboratories would have been helpful, but their inclusion would have given the plan an outward appearance of a literature review of specific areas, and this was not the intent or the scope of the plan. This information will be forthcoming in tasks relating to this area. We are also in full agreement that one of the more specific needs is to examine various hydrogeologic complexities and features for different spatial and temporal scales related to development and movement of contaminant plumes and expect that these issues will be addressed in research proposals.**

ISSUE 6

COMMENT: This issue has been examined, for example at the EPA-supported Borden site studies by the University of Waterloo and Stanford University. The use of geophysical techniques adapted to hydrogeologic and tracer characterization also needs to be considered. DOE should be commended in its plans to use fiberoptic systems and the use of sophisticated data collection systems in hydrogeologic characterization.

RESPONSE: **The intent in development of the plan was to stimulate interest and express the need for conducting innovative research to conduct advanced methods for restoration. One of these needs is the use of geophysical techniques for characterization of contaminant plumes.**

ISSUE 7

COMMENT: Section 2.2.1.1 should show how accomplished studies are related to remedial action plans. For instance, research by PNL on groundwater interdictive strategies for severe nuclear power plant accidents dwelt on this topic and should be reviewed. This item is of critical importance in the selection and evaluation of the interdictive strategies and possible remediation action efforts.

RESPONSE: **The plan gives the impression that little has been gained from past studies, and this is an oversight. In reality a lot has been learned, and the plan should have stated some of these accomplishments along with some of the needs to make characterization more effective. Funding of research proposals will take into account how well the organization can tie in past accomplishments with future needs.**

ISSUE 8

COMMENT: Section 2.2.1.7 on understanding contaminant distribution and behavior in subsurface environments could be improved by citing ongoing research studies throughout the world (e.g., Stripa studies coordinated by OECD) and summarizing their accomplishments and remaining technical issues. The behavior of contaminants, which may vary greatly in physical and chemical properties, makes this issue extremely important for developing the analysis techniques for evaluating contaminant plume behavior. Such techniques are needed to support selection of the correct interdictive measure and remediation techniques.

RESPONSE: **The point is well taken; however, citing and summarizing ongoing research studies throughout the work would have made the plan extremely voluminous and given the plan a "state of the art" review impression, which was beyond the scope and**

intent of such a wide-reaching plan. The quality of such reviews in research proposals addressing subsurface transport characterization will be one of the factors taken into consideration in funding of new projects.

ISSUE 9

COMMENT: In Section 2.2.2.2, the criteria for evaluating the success of models for simulating radionuclide transport for various field-scale predictions may not be achievable in the early phases of the environmental restoration effort. Separate-effects experiments need to be defined to help direct early modeling efforts before complete model validation with field testing can be accomplished.

RESPONSE: **The plan expresses needs, and, with respect to model development, needs likely do not reflect short-term achievements in all aspects. The intent is to develop valid dependable models that can be used as predictors of transport. Obviously, this will not be possible for all sites or all contaminants. The first approach is to address the simple well-defined systems, and, as suggested by the reviewer's comments, to address separate-effect experiments before validation with field testing.**

ISSUE 10

COMMENT: Section 2.2.4.1 has a good discussion of the options and difficulties of interdiction measures. However, it could be improved by discussing the need to consider combinations of interdiction measures and determining their performance objectives over the period of environmental assessment.

RESPONSE: **The point is well taken. Section 2.2.4.1 suggests how a number of technologies can be used to interdict contamination sources, but fails to suggest studies relating to how the performance of one might be better than others or how combinations of the technologies might be used. On the other hand, these points are addressed peripherally in Section 2.2.4.4.**

ISSUE 11

COMMENT: Complete interdiction of contaminants to the accessible environment and eventual groundwater remediation rely heavily on these contributions. A discussion of how groundwater sampling and modeling studies provide input into the selection and performance assessment of the interdiction measures employed also would be helpful.

RESPONSE: **The reviewer's comment may be a step ahead of the topic in Section 2.2.4.1, needs for interdiction of contamination sources. The comment is more appropriately related to selection and performance assessment of interdiction methods and needs to be incorporated into Section 4.2.4.4.**

ISSUE 12

COMMENT: It would provide a logical transition to Section 2.2.4.4 on groundwater remediation alternatives. The comparison should be tied to performance objectives over the life of the contaminant plume (e.g., need for transient simulation studies) and assessments of the effectiveness of the remediation measure during its life. The lessons learned at Rocky Mountain Arsenal illustrate the need to revisit the comparison question periodically during the project to reconsider examining the need for selecting other groundwater remediation techniques.

RESPONSE: **Section 2.2.4.4 addresses and prioritizes groundwater remediation alternatives in a broader scope than addressed by the reviewer's comments. The intent of Section 2.2.4.4 was to compare remediation alternatives in a manner to protect affected users as quickly as possible. The reviewer's point is a good one, but it relates to selecting or comparing various technologies to conduct a specific goal. However, the point about relating the comparisons of remediation alternatives to performance objectives over the life of the contaminant plume needs to be considered.**

ISSUE 13

COMMENT: Sections 2.2.4.2 and 2.2.4.3, on remediation of groundwater for organics, radionuclides, heavy metals, etc., would be improved by citing EPA's research and experiences in reviewing cleanup activities of such contaminants.

RESPONSE: **See response to Issue 14.**

ISSUE 14

COMMENT: The National Water Well Association has organized numerous conferences on aquifer restoration. Citing papers in these proceedings on groundwater remediation techniques would help illustrate the existing technology and possibilities for their success for your applications.

RESPONSE: **Again, the plan was not intended to be a review of the state of technology, though those writing the plan were familiar with and, in certain instances were principal investigators of, leading studies on groundwater and soil remediation. Proposals to DOE addressing specific research tasks should, however, contain sufficient background documentation to illustrate their knowledge of advances in cleanup activities and experiences.**

ISSUE 15

COMMENT: In Sections 2.3.3 and 2.3.2.1, the report should identify which transuranic radionuclides in TRU wastes will be studied.

RESPONSE: **The intent of these sections is not to study the specific transuranic radionuclides of TRU wastes, but rather to identify how certain TRU wastes will be treated to meet WIPP waste acceptance criteria. At present these waste forms either release water or gases on storage, contain reactive metals such as sodium et al., or possess other characteristics that result in their failure to meet waste acceptance criteria. Before these wastes can be disposed of at the WIPP site, they must be treated to obliterate these undesirable characteristics.**

ISSUE 16

COMMENT: Section 2.3.3.1 discusses the very important problem of LLW characterization to support treatment and disposal. The work described should be useful for characterizing the LLW source term. DOE should give this work a high priority and explain in more detail how it plans to characterize LLW for radionuclide species, including chelating complexes. Does DOE plan to do research in the analysis of ^{99}Tc, ^{241}Am, transuranic radionuclides, ^{54}Mn, ^{63}Ni, and other radionuclides that require radiochemical procedures for separation before counting by gamma-ray or alpha-particle spectrometry?

RESPONSE: Source-term evaluation of LLW waste forms has a high priority in DOE research plans. To comply with DOE Order 5820.2A and EPA's proposed 40 CFR 193, it will be necessary for DOE to characterize the quantities, chemical speciation, and leaching characteristics of all radionuclide forms in LLW. Details of these approaches and results will be released in appropriate DOE reports, conferences, and open literature publications.

ISSUE 17

COMMENT: Section 2.3.3.2, on LLW stability, should refer to the stability requirements in 10 CFR Part 61, Section 51.6(b) to ensure that Class B and C LLW is stable to chemical, biological, and radioactive effects. (10 CFR Part 61 should be added to the list of references in Appendix B). DOE should develop performance criteria by conducting tests on solidified LLW that involve compressive strength, radiation stability, biodegradation, leachability, and immersion. A helpful reference to aid in the design of such testing is Proceedings of the Workshop on Cement Stabilization of Low-Level Radioactive Waste, NUREG/CP-0103.

RESPONSE: DOE is totally aware of the 10 CFR Part 61 stability requirements, concurs fully with its intent, and is also in the process of developing performance tests along similar lines. It is DOE's intent not to duplicate, but to complement and validate the 10 CFR Part 61 stability requirements.

ISSUE 18

COMMENT: As part of the crosscutting program initiatives discussed in Section 5.2.1, DOE should consider adding the development of beta-particle spectrometry to measure activities of ^{90}Sr, ^{14}C, and other beta emitters rapidly and without chemical separation; the development of a rapid method for measuring organic chemicals in groundwater at part-per-billion and part-per-trillion levels; and development of a method for identifying chemical compounds or complexes in groundwater containing radionuclides and chelating agents.

RESPONSE: Sections 2.1.6 and 2.2.1.5 identify the needs for improved analytical procedures. DOE intends to pursue analytical chemical technology for radionuclides and organics.

ISSUE 19

COMMENT: From our perspective, the most challenging aspect of the RDDT&E Plan is the development or identification of analytical and assessment methods that can generate viable information for policy formulation from limited data. Examples include the requirement for (a) methodologies for defining optimum site characterization protocols in support of your "worst first" remediation strategy; and (b) assembling the requisite data for credible risk assessments. As pointed out in the RDDT&E Plan, assessing current levels and future migration of contaminants in the air, water, and terrestrial compartments of ecosystems can be prohibitively expensive relative to both sample collection and analysis. Mitigating this problem will require judicious combinations for targeted environmental sampling and the gap between contaminant exposure levels and the quantification of human and environmental sampling and reliable model calculations. Similarly, dose-response data needed to bridge the gap between contaminant exposure levels and the quantification of human and environmental health impacts are often quite inadequate.

RESPONSE: DOE agrees that this is a challenge.

ISSUE 20

COMMENT: We are pleased to note references in the Plan to the utilization of university resources. Penn State has considerable expertise in a number of relevant areas, including the statistical and stochastic risk assessment methods that appear to be central to the development of site remediation strategies and priorities.

RESPONSE: Risk assessment is an important aspect in determining the appropriate remedial measures to be taken.

ISSUE 21

COMMENT: With our interest in engineering and science, we naturally wish to participate in research programs of national importance. My associates and I have reviewed the plan, and we have comments and suggestions that relate to how we and other academic institutions might participate.

RESPONSE: DOE is pleased to note your interest. Sections 5.7.1 and 5.7.2 of the Five-Year Plan deal with education initiatives and should be of interest to you.

ISSUE 22

COMMENT: My recommendation would be to maximize the degree to which research areas may be addressed by those organizations most likely to contribute to the associated problems in constructive, innovative fashion. I believe that RPI has unique capabilities for contributing to certain areas identified in the plan, as do other organizations.

Consistent with this recommendation, I would minimize the degree to which restrictive procedures would be used. For example, the plan calls for a call for proposals to DOE laboratories. I have great respect for DOE laboratories, and RPI has good collaborative relations with several labs. DOE labs would naturally obtain a major share of any open solicitation. A restrictive solicitation, however, would preclude generating independent ideas in various aspects of the program and would adversely affect the credibility of the DOE program.

RESPONSE: The commentor has misunderstood. DOE laboratories do not respond to open solicitations. Rather, open solicitations are directed to universities and other non-Federal organizations that have an interest in and capabilities for the work solicited. The purpose of open solicitations is to generate interest from multiple sources from outside the Federal laboratory system and to select the organization(s) having the greatest capability.

ISSUE 23

COMMENT: I also am concerned about the degree of emphasis on relationships with universities based primarily on proximity to DOE laboratories. Naturally, there are advantages of proximity on which DOE and pertinent universities should capitalize. We have relationships with DOE and other government and industry laboratories near us that are enhanced by proximity. We also have relationships with DOE and other government and industry laboratories throughout the country based on unique expertise at RPI. DOE should ensure a balance among relationships based on geography and relationships based on unique expertise.

RESPONSE: The university consortia are defined both by geographical relationship to DOE laboratories and by capabilities. Universities having truly unique capabilities needed by DOE that are not members of the consortia will have the opportunity to participate through grants and competitive procurements.

ISSUE 24

COMMENT: We would like to underscore this need for greater university involvement. It would be important to structure closer involvement of the national laboratories with universities in such a way that university researchers serve as coprincipal investigators rather than subcontractors on research projects of this nature.

RESPONSE: DOE research conducted in universities usually has the university researcher as the principal investigator. If the research is being done under a contract, the principal investigator will have a contract/technical manager. Such is not true for research done under a grant. While it is possible that university researchers serve as coprincipal investigators, such arrangement implies that the university researcher has less control over the actual research than in the other arrangements.

ISSUE 25

COMMENT: These activities are shared by the University of Michigan, Michigan State University, and Howard University under the umbrella of the Michigan Universities Consortium for Hazardous Waste Management. We would be pleased to provide further information on this group pending your continued interest.

RESPONSE: The university community is recognized as a major component of the national technology development resource.

ISSUE 26

COMMENT: The University of Nebraska-Lincoln is interested in participating as a DOE partner through a consortium of the Mid-America State Universities Association (MASUA), consisting of the University of Nebraska-Lincoln, Iowa State University, The University of Missouri-Columbia, Kansas State University, and Oklahoma State University. We are in the process of contacting them relative to their interest.

RESPONSE: The university community is recognized as a major component of the national technology development resource.

ISSUE 27

COMMENT: We share the perspective of the Task Force in recognizing the great need for an improved system to identify and nurture innovative technologies to address environmental challenges. We agree with the statement in the draft Plan that in 30 years current technologies will appear antiquated. This presents a unique need to use present resources for the development of future solutions to the problems of DOE's waste disposal practices.

RESPONSE: DOE agrees.

ISSUE 28

COMMENT: To meet the objectives established by DOE in the draft RDDT&E Plan, a high level of cooperation of available resources and a focused agenda will be needed. As the draft Plan recognizes, partnerships could exist to stimulate the awareness and integration of existing technologies from a wide variety of sources, including other agencies, international technologies, university and industrial efforts, regulatory and public policy processes, and basic research. These partnerships could assist RDDT&E to rapidly move DOE into the project and process stages of its efforts so as to enable the established cleanup and compliance goals to be met.

RESPONSE: DOE agrees.

ISSUE 29

COMMENT: We agree that international technology exchange could expedite the assessment and transfer of available and developing foreign technologies for application to DOE's Environmental Restoration and

Waste Management problems. This is an area in which I am particularly involved given my participation as Chairman of EPA's National Advisory Committee for Environmental Technology Transfer (NACETT). As part of the International Subcommittee of NACETT, I join a distinguished group of colleagues that explores a variety of initiatives for international technology transfer for environmental applications.

RESPONSE: **DOE is pleased to have this information.**

ISSUE 30

COMMENT: Created in October 1988, NETAC is a unique organization formed through a public-private partnership between the University of Pittsburgh Trust and the U.S. EPA. The purpose of NETAC is to accelerate the commercialization of priority technologies which will positively impact the nation's most pressing environmental problems.

NETAC was created to assist in the identification and development of business activities utilizing new and emerging technologies within the environmental industry. In so doing, NETAC differs from most environmental organizations in three fundamental ways. First, it is a partnership for solving increasingly pressing environmental problems.

RESPONSE: **DOE commends the University of Pittsburgh in its progressive realization of the need to approach complex environmental problems by coupling industry, government, and academe and looks forward to participation with NETAC on some of the needs outlined in the plan.**

ISSUE 31

COMMENT: We are actively involved in assisting DOE in its remediation efforts at several of its facilities; new techniques and practices that will enhance this work could be significant for us. We have, since the early 1980s, conducted research programs in toxic waste hydrology and nuclear waste hydrology which address several of the topics mentioned in the RDDT&E Plan; we hope to meet with your office in the near future to coordinate the research efforts of our two organizations.

RESPONSE: **DOE appreciates the technical assistance the USGS has provided in the past as well as that ongoing at many of its sites. Hopefully this plan will provide greater opportunities for a continued and stronger relationship to conduct the research needed so that DOE can meet its 30-year cleanup goal more expeditiously.**

ISSUE 32

COMMENT: Our experience in the toxic and nuclear waste hydrology programs has amply demonstrated the value of both conducting research and applying research results at actual field sites. We, therefore, strongly endorse the statement on p. 39 of the RDDT&E plan that DOE intends to establish "test beds" or integrated demonstration sites at various DOE installations. We would like to work with the DOE in the selection for such sites and in coordinating our test site activities with those of DOE.

RESPONSE: **It is gratifying that experiences by DOE and USGS value the need to conduct research at actual field sites. DOE looks forward to continued cooperation with USGS in establishing integrated demonstration sites at selected DOE installations.**

ISSUE 33

COMMENT: Conceptual and mathematical models of natural physical systems appropriately form an integral part of much of the RDDT&E plan. At places in the plan, pp. 60, 61, for example, the limitations of such models are clearly stated; but at others, such as pp. 76 and 90, limitations on the usefulness of models are not mentioned. The absence of such qualifying statements may be due to the topical organization of the plan, which highlights various subjects without going into depth.

RESPONSE: **Your point on defining limitations on the usefulness of models is especially well taken. DOE also has encountered difficulties or has been disappointed in the ability to satisfactorily model transport of contaminants in unsaturated zones or fractured flow of soils. We look forward to your experience along these lines to assist us in selecting realistic goals as well as establishing limitations on what can be expected in a rather confined time frame.**

ISSUE 34

COMMENT: The line between basic and applied research is not clearly defined in the plan, and we recognize that it is not possibie to do so in a rigorous way. Plans for coordination between the new Office of Technology Development and DOE's existing Office of Energy Research are spelled out. We would note here that the USGS has research activities that fall into both categories.

RESPONSE: **DOE and USGS have collaborated successfully in the past on both basic and applied research, and it should be possible to build on this history.**

ISSUE 35

COMMENT: "DOE RDDT&E activities must comply with all applicable laws, regulations, adding regulatory constraints to planning and implementation."

This statement should be rewritten as follows:

"DOE RDDT&E activities must comply with all applicable laws, regulations, and requirements as established by EPA, States, Indian Tribes, and local governments."

RESPONSE: **Thank you for the comment. The relationship between DOE and the Tribes will be properly reflected in the FY 1992-1996 Five-Year Plan.**

ISSUE 36

COMMENT: The RDDT&E Plan makes occasional reference to participation by external groups in review of the plan, but unlike the Five-Year Plan, includes no schedules for such participation. The RDDT&E Plan, as written, takes a step backward from the Secretary of Energy's commitment to ensure involvement in the planning process by those most affected by DOE's plans. Refer to Section 1.4, RDDT&E Implementation, p. 41. In the FY 1990 schedule, there is no milestone that includes solicitation of external review or comment of RDDT&E activities.

RESPONSE: DOE has sought external review for the RDDT&E Plan and will continue to pursue similar input. Figure 1.4b of the RDDT&E includes a milestone "Complete external review of RDDT&E Plan" (2Q FY 1990).

ISSUE 37

COMMENT: As recognized in the RDDT&E Plan, the DOE Nuclear Weapons Complex was not designed with waste minimization or waste disposal in mind. As a consequence, the RDDT&E Plan must recognize that reorientation of DOE toward waste minimization and permanent waste disposal will require cultural and administrative change at least equal to potential technological change. Many goals proposed in the RDDT&E Plan may be achieved through implementing aggressive administrative procedures which minimize waste production, rather than waiting for a "technological fix."

RESPONSE: DOE agrees.

ISSUE 38

COMMENT: The RDDT&E Plan is lacking in its description of how R&D will be implemented by the Operations Offices. It is apparent that DOE is planning a centralized office for R&D. However, all benefits of R&D must ultimately be gained at the field level, in applications to individual sites with particular problems. The Plan should describe in detail the interaction between the Office of Technology Development and the field offices.

RESPONSE: Sections 5.2, 5.2.1 and 5.2.2 in the FY 1992-1996 Five-Year Plan include greater discussion of these management details.

ISSUE 39

COMMENT: DOE is currently developing a National Prioritization System for allocating resources to environmental restoration projects across the nation. This system is called the Budget Allocation System for Environmental Cleanup (BASEC) and will be a risk-based system that assigns values to individual environmental restoration projects. One of the goals of the RDDT&E effort is to lower costs of characterization and remediation at DOE sites. An obvious question, then, is how potential cost savings of R&D for a given ER project will be factored into BASEC.

RESPONSE: That is an excellent question. As participants in the scoping and review of BASEC, the Yakima Indian Nation is aware that several such important questions remain. Including potential cost savings from R&D results is one of the goals of the team developing BASEC and work continues toward that end.

ISSUE 40

COMMENT: The Yakima Indian Nation requests that the predecisional RDDT&E Plan be revised to reflect a proper recognition of Tribal rights, as they pertain to RDDT&E plans and activities. In particular, there should be explicit recognition that RDDT&E activities, beyond their immediate impacts on Treaty rights (such as discharges of hazardous materials to the environment during the testing phase), have long-term impacts on Treaty rights since such activities ultimately lead to implementation of specific technologies which impact the environment.

RESPONSE: The impact of technologies on all Federal, State, and local laws and regulations, including those established under Treaty, is of paramount importance. Consideration of those impacts will be key during technology evaluations.

ISSUE 41

COMMENT: The overall objective of the OTD requires consideration of nontechnological solutions to achieving solutions to "technical issues." For example, discharge of low-level radioactive waste liquids to the soil column, which maintains a gradient for moving contaminants toward groundwater, may be considered a technical problem. Conversely, examination of the entire DOE complex, and associated objectives, may yield a nontechnical solution whereby an entire waste stream may be eliminated without compromising the system objectives. Extensive policy coordination between the Office of Technology Development and the Defense Programs, Nuclear Energy Programs, and Energy Research Programs is mandatory for successful, least-cost performance of OTD objectives.

RESPONSE: DOE agrees.

ISSUE 42

COMMENT: pg. xiii:
"Although the OTD will not prioritize cleanup and compliance activities, it will contribute to setting those priorities."

The issue which is not addressed in the Foreword is how the OTD will set its own funding priorities for R&D expenditures, and how it will allow for external (Tribal) participation in its process. In addition, the OTD must develop recommendations for assigning value to R&D activities within the National Prioritization System.

RESPONSE: OTD sets funding priorities by evaluating proposed R&D activities according to the following attributes: reduced public and

environmental risk, reduced environmental restoration and/or waste management costs, reduced environmental restoration time, reduced waste generation, development costs, likelihood of technical success, timeliness of availability, expected regulatory and social acceptance, innovation, and teaming. Final selections are made by OTD considering these evaluations as well as independent recommendations from a number of peer review groups. Final OTD sections are then reviewed within DOE by the Environmental Restoration and Waste Management Organizations to ensure properly focused RDDT&E activities. The final results are summarized each year in the annual update of the Environmental Restoration and Waste Management Five-Year Plan. Tribal participation is assured through review and comment on the Five-Year Plan and other documents made available for public review through the Richland Operations Office and through DOE-sponsored workshops and public hearings.

The National Prioritization System deals with environmental restoration problems and does not include waste management improvements or R&D activities.

ISSUE 43

COMMENT: The Yakima Indian Nation requests the schedule from the Office of Technology Development regarding "development of a methodology incorporating the consensus of the public, EPA, affected States, Indian Nations, and other regulatory and environmental concerns."

RESPONSE: **See Section 5.6 of the FY 1992-1996 Environmental Restoration and Waste Management Five-Year Plan.**

ISSUE 44

COMMENT: Section 1.1, STRUCTURE OF THE PLAN AND THE RDDT&E PROGRAM pg. 2:

In the example illustrating the logic of the RDDT&E Program, remediation of the Hanford single-shell tanks (SST) is summarized and linked to elements of the Plan. It is essential that the Plan take into account the effect of requirements imposed by the Treaty of 1855 between the U.S. Government and the Yakima Indian Nation (YIN) on implementation of options developed by the Plan. Successful implementation of R&D technologies will require early consultation with the YIN on options considered and full disclosure of environmental consequences of such options.

RESPONSE: **The SST roadmap was used as an example, but is, of course, subject to further revision and development as new information becomes available.**

ISSUE 45

COMMENT: Section 1.1.1, PURPOSE AND SCOPE OF THIS PLAN pg. 6:

"RDDT&E Emphasis Areas: As will be discussed in detail in subsequent sections, the most urgent needs for RDDT&E fall into the categories of waste site characterization, waste minimization, waste migration containment, in situ remediation, and mixed waste treatment."

Although the Plan has identified emphasis areas, there is no discussion regarding selection of these areas from a presumably larger set of areas. The Plan should identify how the emphasis areas were selected. For example, why is in situ remediation selected over potential new technologies which permit improved offsite remediation?

RESPONSE: **Discussion regarding other areas is included in Sections 2.0, 3.0, and 4.0. Emphasis areas were identified by an assessment of the Environmental Restoration and Waste Management needs areas, summarized in the Environmental Restoration and Waste Management Five-Year Plan. Future updates to the Five-Year Plan will include a discussion of the areas of Environmental Restoration and Waste Management need and corresponding areas of new technology emphasis.**

It is not intended to imply that in situ remediation is selected over potential new technologies which permit improved offsite remediation. In situ techniques have the potential of huge costs savings (greater than technologies that require removal, handling, packaging, shipping, and burial offsite), if they can be developed and demonstrated to be socially acceptable and meet expected regulatory requirements.

ISSUE 46

COMMENT: "Specifically, DOE will request from Operations Offices special Activity Data Sheets for RDDT&E."

How will such special ADSs be incorporated into the National Prioritization System? Are not all ADSs subject to improvements through R&D?

RESPONSE: **RDDT&E Activity Data Sheets will not be incorporated into the National Prioritization System. This system deals with environmental restoration problems only; no R&D activities.**

ISSUE 47

COMMENT: The Yakima Indian Nation requests from the OTD its detailed plan for working with the State and Tribal Government Working Group (STGWG) on RDDT&E matters.

RESPONSE: **DOE will continue to work through STGWG on RDDT&E matters.**

ISSUE 48

COMMENT: The Yakima Indian Nation requests from the OTD its plan and schedule for involving affected Indian Tribes in development of a prioritization methodology for RDDT&E activities.

RESPONSE: The plan and schedule for developing a prioritization methodology for RDDT&E activities are summarized in the FY 1992-1996 Five-Year Plan. We would appreciate your participation, that is, your review and comments and any suggestions for our consideration. Briefly, OTD will test a basic proposal review scoring and ranking approach in FY 1990 on a subset of RDDT&E proposed activities. Scoring and ranking will be according to a set of attributes (see response to comment 8). For FY 1990, however, selections will be made primarily on the basis of subjective judgments by OTD, considering recommendations from peer review groups.

ISSUE 49

COMMENT: Section 1.1.2, SUMMARY OF PROPOSED ACTIONS pg. 8:

"Specifically, DOE will complete a risk-based benefit-cost analysis by FY 1992." What will the benefit-cost analysis measure?

RESPONSE: DOE is reviewing all RDDT&E proposals to ensure they are needs driven and are responsive. Funding decisions are being made based on the project being able to solve a DOE problem using the best technical solution. One of the evaluation criteria is cost-benefit. This cost-benefit analysis will feed into a comprehensive cost-benefit analysis of the OTD program.

ISSUE 50

COMMENT: Cost for Environmental Restoration and Waste Management have been developed for Five-Year Plan activities, ranging from $100 to $130 billion over the next 30 years. The Environmental Restoration and Waste Management technologies employed to produce such estimates should provide a baseline to measure R&D gains against. Such technologies and methods should be described, with comparisons made between them and potential new technologies.

RESPONSE: The RDDT&E document is needs driven. A listing of available technologies was published in a companion document. The estimate of $100 to $130 billion is based on excavation and treatment before placement in a secure landfill, and the purpose of the R&D effort is to find more satisfactory methods for solving the problem.

ISSUE 51

COMMENT: The Yakima Indian Nation should have early access to the R&D decision process, to identify potential advantages and disadvantages of final applications of R&D developments.

RESPONSE: External review of the RDDT&E Plan, the Five-Year Plans, and other documents will continue.

ISSUE 52

COMMENT: The Yakima Indian Nation requests the OTD plan for involving the regulatory community in the earliest phases of the RDDT&E process.

RESPONSE: See Section 5.6 of the FY 1992-1996 Five-Year Plan.

ISSUE 53

COMMENT: What are DOE plans for achieving education goals?

RESPONSE: See Sections 5.7 and 5.7.1 of the FY 1992-1996 Five-Year Plan for plans to increase enrollments in science and engineering.

ISSUE 54

COMMENT: DOE estimates that 10 percent of Environmental Restoration and Waste Management expenditures will go for R&D support. How is this 10 percent accounted for in Headquarters, Operations Office, and external budgets?

RESPONSE: The Office of Technology Development will have its own Budget and Reporting code numbers.

ISSUE 55

COMMENT: Figure 1.2.1 should be expanded to show the necessary interchange between Waste Management, Environmental Restoration, and OTD.

RESPONSE: See Figure 5.2.1 in the FY 1992-1996 Five-Year Plan.

ISSUE 56

COMMENT: "DOE RDDT&E activities must comply with all applicable laws, regulations, and requirements as established by EPA, States, Indian Tribes, and local governments."

RESPONSE: DOE will comply with regulatory requirements.

ISSUE 57

COMMENT: The Yakima Indian Nation requests information on how the Division of Educational Program Development plans to involve Yakima students in its outreach program and on what opportunities are available for study and work related to Five-Year Plan activities.

RESPONSE: See Sections 5.7 and 5.7.1 in the FY 1992-1996 Five-Year Plan.

ISSUE 58

COMMENT: The Yakima Indian Nation requests information on the process by which the STGWG will help in the selection of the ad hoc advisory panel.

RESPONSE: See Section 5.6 in the FY 1992-1996 Five-Year Plan.

ISSUE 59

COMMENT: Data from the Integrated Data Base (IDB) should be readily available at the operable unit level, or project level, for the Yakima Indian Nation to review. Access could be provided through a computer network. Such access should prevent roadblocks due to delayed provision of information on specific waste sites or waste management projects which impact Treaty rights.

RESPONSE: **The IDB is public information and available to the Yakima Indian Nation as printed hard copy. The IDB is not now operable in a computerized, on-line format. At such time that an on-line version becomes operable, it will be available to the Yakima Indian Nation, along with DOE users and others.**

ISSUE 60

COMMENT: QA procedures should be readily available to the Yakima Indian Nation at all levels of the RDDT&E program.

RESPONSE: **DOE QA procedures are public documents and are available as they are developed and approved by management.**

ISSUE 61

COMMENT: Figure 1.3.6 should reflect recognition of Tribal participation in the QA process.

RESPONSE: **DOE recognizes the Yakima Indian Nation interest.**

ISSUE 62

COMMENT: The Yakima Indian Nation requests the following documents associated with the milestones described in Figure 1.4b:
FY 1990 1st Quarter: 2, 3, 4, 5, 6
FY 1990 2nd Quarter: 4
FY 1990 3rd Quarter: 1, 2, 3, 4
FY 1990 4th Quarter: 3, 4

RESPONSE: **The Yakima Indian Nation will be placed on the distribution lists for these documents.**

ISSUE 63

COMMENT: Performance criteria for proposed technologies should be available for evaluation by the Yakima Indian Nation at the earliest possible opportunity. Such provision of information applies to characterization, assessment, and remediation, and applies to waste management and D&D, as well as environmental restoration. Risks associated with a particular application are not generic, and risk exposure to the Yakima Indian Nation is unique due to unique lifestyle patterns protected under the Treaty. Methodologies for screening and selecting potential technologies and assessing their risks must include participation by the Yakima Nation.

RESPONSE: **Methodologies for screening and selecting potential technologies and assessing their risks developed under RDDT&E program support will be reviewed with appropriate stakeholders, including the Yakima Indian Nation.**

ISSUE 64

COMMENT: Section 2.1.6, STRATEGY FOR ENVIRONMENTAL ANALYTICAL CHEMICAL CAPABILITY pg. 56-57:

"DOE has limited analytical laboratory capabilities to perform the environmental analyses required under regulatory protocols [RCRA, CERCLA, Solid Waste Disposal Act (SDWA), Clean Water Act (CWA), and Clean Air Act (CAA)]. It is anticipated that demands of environmental analytical chemistry procedures at DOE's sites will escalate by a factor of 4 to 10 during the next 3 to 8 years."

Though DOE will develop an Environmental Analytical Methods Manual, as well as QA/QC procedures, much of the analytical chemistry laboratory work should be contracted in open bids, in order to allow for advanced automatic testing and other modern techniques, which will lower costs. Estimated cost for analyzing one sample from the Hanford single-shell tanks is $100,000.

RESPONSE: **Due to the load demand for chemical analyses, some of which is highly specific, DOE will rely heavily on contract laboratories. However, to ensure quality control, these laboratories must meet required performance criteria. In addition, DOE will invest heavily in development of improved analytical methods which will be transferred to these contracting laboratories so that analyses can be conducted faster and with less expense.**

ISSUE 65

COMMENT: Lack of sampling and characterization technologies is indicated in Section 2.3.4.1. Promoting advances in laboratory analytical technology must be an integral part of the RDDT&E Plan.

RESPONSE: **No question about it. One of the primary goals of the DOE RDDT&E plan is to be able to sample and characterize wastes quickly, accurately, safely, and at minimum costs.**

ISSUE 66

COMMENT: Risk assessment cannot be applied in a uniform sense to a hypothetical homogeneous population. In the real world, distribution of risk to subgroups within populations is not uniform. Since DOE has pledged to recognize treaty rights, and therefore to recognize the impacts of DOE activities upon Native American people, DOE must incorporate methods for evaluating the unique risks posed to Native Americans by DOE activities. The following sentence should be added to the above passage concerning risk assessment:

"Risk assessment must account for characteristics for particular subgroups of a population which possess unique exposure to hazards and response to a given dose. For example, Native Americans have special lifestyle and food consumption patterns which must be accounted for in risk assessment."

RESPONSE: **DOE recognizes the unique exposure to hazardous materials of particular subgroups and will attempt to address risk assessment in an equitable fashion in the case of the Yakima Indian Nation.**

APPENDIX C

ISSUE 67

COMMENT: "ER activities will be conducted in communication and collaboration with agencies of the United States and State governments, particularly with environmental regulatory agencies." This sentence should be changed to read: "ER activities will be conducted in communication and collaboration with agencies of the United States, State governments, and affected Indian Tribes, particularly with environmental regulatory agencies."

RESPONSE: **It is DOE's intent to communicate and collaborate with the Yakima Indian Nation with respect to its ER activities, and any omission with respect to QA/QC procedures was a oversight on DOE's part.**

ISSUE 68

COMMENT: The people of the Yakima Indian Nation have unique pathways for exposure to toxic substances. This fact has been recognized by the Hanford Environmental Dose Reconstruction Project, which is conducting a multiyear study of doses of radiation received by populations surrounding the Hanford Nuclear Reservation. Multiple offsite pathways to human populations exist for wastes under DOE's waste management and environmental restoration programs. The following sentence should be added to the above passage: "In addition, special population groups exist, such as Native Americans, which have unique exposure pathways to toxic substances."

RESPONSE: **DOE has no objections to the inclusion of such verbiage. In fact the manner in which Section 2.2.2.5 is written implicitly includes special populations such as Native Americans. Also, the fact that the Hanford Environmental Dose Reconstruction Project recognizes the unique pathways for exposure of toxic substances to the people of the Yakima Indian Nation supports inclusion of such verbiage.**

ISSUE 69

COMMENT: Some aspects of ecology are explicitly protected for the Yakima Indian Nation in the treaty of 1855, including fish, game, and roots. Courts have determined that such natural resources in turn depend upon a healthy ecosystem, and that such a healthy ecosystem is also a right guaranteed in the treaty of 1855. Therefore, any assessment of risks to the ecosystem must incorporate parameters which describe protection of Yakima Nation natural resources, as described in the Treaty of 1855.

RESPONSE: **The DOE is aware of the concerns of the Yakima Nation and will not violate any treaties. The intent of OTD effort is to do things better.**

ISSUE 70

COMMENT: How does the RDDT&E Plan account for failure to interdict the source of such contamination problems, especially with regard to Secretary Watkins' pledge that Environmental Restoration and Waste Management goals supersede production goals?

RESPONSE: **Interdiction of mobile contaminants is identified as an early step in groundwater remediation.**

ISSUE 71

COMMENT: As with environmental restoration activities, D&D activities have the potential for disturbing large areas of land. Some of this land contains Native American artifacts and significant sites which are protected under treaty rights or federal law. D&D planning must fully account for such potential disturbance to culturally significant sites.

RESPONSE: **Where D&D involves large areas, potential disturbance of cultural sites will be considered.**

ISSUE 72

COMMENT: The people of the Yakima Indian Nation have lived in their present domain for thousands of years. An integral element of Yakima culture is a perspective of time quite different from that of the mainstream culture. Plans concerning postclosure monitoring and marker technology must account for habitation by Native Americans thousands of years into the future.

RESPONSE: **Obviously, planning into the future thousands of years is a difficult task, and DOE does not wish to perturb the environment any more than absolutely necessary. Thus DOE will make a concerted effort to develop postclosure monitoring plans that will be as flexible and meaningful as possible.**

ISSUE 73

COMMENT: The Yakima Indian Nation requests information on the decontamination and dismantlement of the radioactive melter in the 324 building at Hanford. No information on such activities has been received to date.

RESPONSE: **The request has been relayed to the DOE Richland Operations Office.**

ISSUE 74

COMMENT: OTD should factor risk reduction associated with waste minimization along with budget savings realized through waste minimization. Although it is recognized that risk reduction is more difficult to quantify than budget reduction, efforts must be made to calculate such progress.

RESPONSE: **OTD is working on a cost analysis methodology for waste minimization cost savings. At this time, the analysis will be based on reduced cost of waste treatment, storage, and disposal; reduced capital costs for environment, safety, and health projects that become unneeded; improved operating productivity; and other measurable costs. The analysis will reference guidance from the EPA for calculating the value of waste minimization. Risk assessments are now used in planning and rationalizing DOE priorities. However, "risk" is difficult to quantify at**

this time since it is incompletely defined, subjective, and understood more in qualitative terms. As more quantitative data on cost savings from risk reduction become available, its use as a cost analysis factor will be applied.

ISSUE 75

COMMENT: Reduction in the future generation of TRU and associated wastes could be accomplished by conducting a careful inventory of all Waste Management Operations to determine which operations are essential to the production mission and which are not.

RESPONSE: The comment implies DOE may have unnecessary operations that generate TRU waste and that such nonessential operations could be shut down for waste minimization. DOE certainly does not create TRU waste unless the operation is part of strategic missions for the United States.

With the increased emphasis by the Secretary of Energy toward Environmental Restoration and Waste Management activities, it is true that significant resources have been shifted away from production operations in favor of increased work on environment, safety, and health and activities such as waste minimization. The shift in emphasis has strained DOE as it still must maintain its responsibility for national security. With the many concerns for waste reduction and waste minimization, DOE is doing everything in its power to avoid waste generation. In fact, the added pressure to reduce costs has the Agency continually searching for nonessential functions to scale back or discontinue.

ISSUE 76

COMMENT: "Existing DOE facilities, process, and products were not designed with waste minimization in mind."

An explicit goal of the Secretary of Energy in developing the Five-Year Plan was that environmental restoration and waste management activities would not be sacrificed to meet production goals. In light of the RDDT&E statement above, it is imperative that DOE conduct a thorough inventory of its WMO to determine which are absolutely essential for meeting production requirements.

RESPONSE: The comment implies DOE may have unnecessary operations that generate TRU waste and that such nonessential operations could be shut down for waste minimization. DOE certainly does not create TRU waste unless the operation is part of strategic missions for the United States.

With the increased emphasis by the Secretary of Energy towards Environmental Restoration and Waste Management activities, it is true that significant resources have been shifted away from production operations in favor of increased work on environment, safety, and health activities such as waste minimization. The shift in emphasis has strained DOE as it still must maintain its responsibility for national security. With the many concerns for waste reduction and waste minimization, DOE is doing everything in its power to avoid waste generation. In fact, the added pressure to reduce costs has the Agency continually searching for nonessential functions to scale back or discontinue.

ISSUE 77

COMMENT: The Yakima Indian Nation requests that DOE provide a contact point for its outreach program, both at the national and at the Richland Operations Office level. Also, the Yakima Indian Nation requests that additional information be provided on the DOE outreach program for Native Americans.

RESPONSE: Educational outreach is discussed in Section 5.7 of the FY 1992-1996 Five-Year Plan.

ISSUE 78

COMMENT: The Yakima Indian Nation requests that DOE provide a description of the DOE-RL Environmental Restoration and Waste Management Education Office. How does this office provide opportunities for Native American students?

RESPONSE: See Issue 79.

ISSUE 79

COMMENT: The Yakima Indian Nation requests more detailed information on DOE's educational outreach program. Please send detailed information to:

Mr. Cecil Sanchey, Chairman
Radioactive/Hazardous Waste Committee
Yakima Indian Nation
P.O. Box 151
Toppenish, Washington 98948

RESPONSE: DOE will contact the Yakima Indian Nation.

ISSUE 80

COMMENT: The following should be added to the section on key environmental regulations affecting RDDT&E:

"Treaties with Federally Recognized Indian Tribes. Treaties signed between Indian Tribes and the United States government are recognized as the supreme law of the land, and such law predates environmental regulations by hundreds of years. Courts have interpreted treaties to guarantee particular levels of environmental protection, since Indian rights to natural resources are dependent upon the natural environment."

RESPONSE: DOE recognizes the legal status of treaties and has committed to meeting the obligations of the Federal government. DOE also recognizes the supreme importance of this issue to the Yakima Indian Nation. The section on key environmental regulations will not be repeated in the update to the plan, however.

ISSUE 81

COMMENT: Idaho's Governor has repeatedly expressed his concern about the Buried Transuranic Waste at INEL. The Plan states in paragraph 2, p. XVII that "Where feasible, given safety and regulatory concerns, RDDT&E must increase DOE's ability to realize enormous cost savings by remediating buried waste in-place, without digging it up for processing and reburying the residue."

RESPONSE: DOE's RDDT&E program seeks technologies to save money by remediation in-place of buried wastes, but technologies must first be effective remediations. While extremely important to DOE and taxpayers, cost savings are a legitimate goal only after environmental, health, and safety needs have been met.

ISSUE 82

COMMENT: This statement should be qualified by adding that the success of remediation of buried transuranic waste in-place will be measured by elimination, or significant reduction of contamination, or potential for contamination, equivalent to waste removal. Later in the document, it is stated that "Ultimately, RDDT&E activities must be prioritized according to a set of properly weighted attributes, including immediate and long-term risk reduction, with Five Year Plan priorities as input." "Ultimately" is a vague term in this context.

RESPONSE: The statements made in the draft RDDT&E Plan regarding in-place remedies for buried waste were, in fact, aimed at all types of land disposed wastes, not solely to buried transuranic wastes, such as those that exist at the INEL. However, regardless of the type of wastes, the Department agrees that the success of any in-place remedy will have to be measured against criteria that include the reduction of contamination on an absolute scale or the reduction in the potential for contamination of the environment, including important environmental resources in the site vicinity. The way in which these reductions are to be measured and the levels these reductions must meet have not yet been determined. But, as stated in Sections 3.1.1 and 3.1.4 of last year's Five-Year Plan, the Department is committed to working with the appropriate Federal and State regulatory agencies on both a national and site-specific level to determine the performance measures and acceptability of all proposed remedies (whether they involve in-place measures or removal and treatment measures) before implementation.

ISSUE 83

COMMENT: It seems that an overall objective of all RDDT&E activities should include risk reduction. Perhaps a clearly defined objective could be "to improve and simplify the overall effectiveness of short-term and long-term risk reduction in remedial technologies applied to current environmental restoration and waste management projects.

RESPONSE: Risk reduction is a primary goal for DOE's environmental restoration and waste operations efforts.

ISSUE 84

COMMENT: RDDT&E activities require coordination with State and Federal regulatory agencies. Without coordination the necessary permits, approvals, reviews or exclusions prior to construction or implementation will delay R&D activities for extended periods of time.

RESPONSE: DOE has committed to full and candid communication and cooperation with all Federal, State, and local regulators.

ISSUE 85

COMMENT: It is recognized that R&D activities are not related to State priorities on the INEL facility, such as corrective actions, compliance, reduction or elimination of risk to the public or the environment, etc.; delays of state reviews may be limited until priorities have been completed.

RESPONSE: DOE would hope that the State of Idaho would not be short-sighted and purposefully delay research that can lead to better cleanups, lower risks to the public, and savings to the taxpayers to enforce a unilateral vision of priority.

ISSUE 86

COMMENT: We appreciate the high priority you have given to the cleanup and environmental restoration of DOE nuclear sites. While we do not have any DOE nuclear sites in Michigan, we believe that your actions to resolve the serious concerns which currently exist as sites in other States are critical to maintaining a high quality of life for our citizens. Equally important is action by DOE to ensure that its facilities are operated and maintained to prevent future environmental damage from occurring. We urge you to emphasize the importance of preventive programs at each of your facilities.

RESPONSE: The Secretary of Energy on June 27, 1989, announced a ten-point plan to move the Department aggressively toward full accountability and compliance with environmental, safety, and health (ES&H) laws. Among the points were revision of award fee contracts for operating DOE's defense production complex so that compliance with ES&H laws and concerns would constitute 51 percent of their semiannual evaluations.

ISSUE 87

COMMENT: The Plan overemphasizes in situ disposal and bioremediation and is therefore too narrow in scope and vision.

RESPONSE: DOE does not agree that the Plan overemphasizes disposal and bioremediation. Emphasis is on developing solutions to the real world

problems that DOE encounters at its various sites throughout the United States.

ISSUE 88

COMMENT: The objective of making new or adapted technologies available before the end of FY 1995 drastically underestimated the time required to implement such technologies. We suggest that the Plan briefly review the time it took to go from concept to implementation for several representative technologies. The review could identify key decision points and necessary approvals for new or adapted technologies.

RESPONSE: **This is an excellent suggestion and will be implemented in the updated plan.**

ISSUE 89

COMMENT: Beyond a perfunctory recognition of the need for public involvement and for regulatory analysis, the Plan does not specify how these will be related to other activities in order to overcome institutional barriers and to increase public understanding and support. The strong problem statements in Sections 2.2 and 2.3 leave out any perspective on how regulatory issues and public concerns will be addressed. These issues may well come to the fore when considering waste treatment technologies, such as incineration, or transport of wastes between sites in order to capture benefits of fully utilizing unique technologies or existing capacities.

RESPONSE: **The mechanisms for public involvement were not fully defined at the time the draft plan was written, although the intent was there. The process for public involvement has been more fully developed and is described in Section 1.15.1 of the FY 1992-1996 Five-Year Plan. DOE expects further evolution in the process as experience is gained and as new stakeholders and their needs are identified.**

ISSUE 90

COMMENT: The Plan fails to provide a program or format for early evaluations of DOE's applied research efforts by State, Tribal, and university experts. DOE needs an early, critical "reality check" by independent and competent persons who seriously listen to various views and reason among themselves to develop a consensus approach.

RESPONSE: **DOE agrees that such outside review is essential. Current plans for review are described in Section 1.15.1 of the FY 1992-1996 Five-Year Plan.**

ISSUE 91

COMMENT: The Plan should have a more detailed discussion on the impact of monitoring costs associated with alternative technologies. Monitoring costs associated with new or adapted technologies may be the determining factor in choosing among them. EPA guidance on high-level or transuranic wastes in 40 CFR 191 calls for a 100-year period of active institutional control. Institutional control of low-level radioactive waste is not expected to be longer that 100 years. Cost-effective decisions will probably be those which minimize long-term monitoring costs.

RESPONSE: **Thank you for the comment. Please see Section 1.4 of the FY 1992-1996 Five-Year Plan for a discussion of how activities will be prioritized.**

ISSUE 92

COMMENT: The implications of the specific problems relating to acceptance of materials at WIPP--e.g., treatment to reduce potential gas generation, or waste analysis for RCRA purposes--would appear to drive the schedule for, and set constraints on, technology development at many other points in the Plan. Yet these implications do not seem to be followed through.

RESPONSE: **The reviewer has correctly identified a major requirement for DOE's Technology Development program. Activities must be focused on needs, including those existing throughout the "life cycle" of materials that become waste. The specific example is at a level of detail beyond the scope of the Five-Year Plan, but the approach by which such coordination will be accomplished is described in Section 1.7 of the FY 1992-1996 Five-Year Plan.**

ISSUE 93

COMMENT: Hanford single shell tanks have stored from 1943 until today, not 1962. Today these old, leaky tanks continue to store wastes.

RESPONSE: **True. The intent of the sentence was to state that wastes were placed in the SSTs during the 1943-1962 time frame. It is clear in the context of the next sentence that wastes are still present.**

ISSUE 94

COMMENT: The Plan should compare RDDT&E funding with the total U.S. DOE budget as well as the ER&WM budget.

RESPONSE: **Budget information for Environmental Restoration and Waste Management, including Technology Development, are included in the Plan. The complete DOE budget is beyond the scope of this document, but is available in the January 1990 document "United States Department of Energy Posture Statement and Fiscal Year 1991 Budget Overview" (DOE/MA-0400). In brief, the 1991 budget request includes $206 million for Technology Development. The total DOE budget request is $17.5 billion, including nearly $2.8 billion for Environmental Restoration and Waste Management.**

ISSUE 95

COMMENT: The purpose of waste site assessments and characterizations is to understand the waste form and the surrounding environment to allow decision-makers to make appropriate decisions. Adequate characterization allows evaluation of solutions which may or may not include permanent solutions.

RESPONSE: DOE fully agrees with the need for adequate characterization, and this is addressed in detail in the FY 1992-1996 Five-Year Plan.

ISSUE 96

COMMENT: The Integrated Data Base includes assumptions on future waste forms that have not been reviewed by cognizant agencies or the public. Assumptions for future amalgamated data bases should have an appropriate review.

RESPONSE: DOE agrees. The establishment by DOE of a formal, centralized, planning process will make possible such coordination.

ISSUE 97

COMMENT: DOE must ensure that the annual symposium provides an early review by independent and competent persons who can influence the direction of research. The symposiums should be more than an annual update.

RESPONSE: DOE agrees.

ISSUE 98

COMMENT: This section on risk analysis and management is not well developed or clear on objective. It is particularly important to "push" the state of the art of risk assessment to get better understanding of how to balance short-term, localized risks against long-term diffused environmental risks.

RESPONSE: Risk assessment is recognized to be an extremely important tool and is being used wherever appropriate in the OTD efforts. Several proposals are being reviewed to push the state of the art in balancing short-term and long-term risks.

ISSUE 99

COMMENT: Although some new technologies may be developed to meet this unique challenge, it is unlikely that new technologies will be developed for all the required analyses. The result is that the time needed for characterization will probably be determined by the time required for a current technology. Because the top of the waste form is covered by a hard crust of salt cake, it is unlikely that a device will be developed to survey the entire tank contents in a short time.

RESPONSE: These concerns will be brought to the attention of the tank R&D investigators. DOE has an aggressive program to solve tank problems and a similar program for characterization.

ISSUE 100

COMMENT: DOE should use the results of work done by NRC and others in efforts such as the HYDROCOIN project for studying groundwater modeling strategies. The study looks at the code verification, model validation, and uncertainty and sensitivity analyses.

RESPONSE: DOE is aware of several model, and will study the HYDROCOIN, as well as other models. DOE's intent is to use the most appropriate model.

ISSUE 101

COMMENT: The Plan should include definitions of what is meant by peer review. In the past, peer review has been conducted by DOE personnel or contractors. Our recommended approach is to use independent experts. Peer review reports should have minority reports, if any, appended to the majority report.

RESPONSE: Peer review includes review by professionals with significant experience applicable to the product being reviewed. It is the intent of DOE to have all technical reports peer reviewed. However, it is obviously impossible from the logistics viewpoint (as well as from the standpoint of finding outside reviewers with applicable experience) to have reviewers outside the DOE system (contractors included) review all reports funded by DOE. Generally speaking, it is the intent of DOE to obtain independent outside reviewers for major reports and projects.

ISSUE 102

COMMENT: The Plan for melter disposal should also incorporate insights gained from decontamination and dismantlement of Trench Vitrification facilities at La Hague.

RESPONSE: DOE has a group actively looking at D&D lessons learned. This comment will be made available to that group.

ISSUE 103

COMMENT: Costs associated with disposal of HLW in a deep geologic repository should be generally proportional to the restrictions of heavy metal contained in each canister. Increasing the waste loading by use of a higher-temperature melter has merit. This is not a new approach. In 1981, a Penberthy Electromelt Process furnace used a higher-temperature melter to produce a glass capable of holding high waste loads. DOE declined to use the high-temperature melter.

RESPONSE: This comment is from the predecisional draft of October 1989. This section was deleted from the November 1989 draft.

List of Commentors on FY 1991-1995
Environmental Restoration and Waste Management Five-Year Plan

Attorneys General of States of:
Arizona, California, Colorado,
Connecticut, Florida, Idaho,
Illinois, Iowa, Minnesota,
Missouri, Nevada, New Jersey,
New York, North Dakota, Ohio,
Tennessee, Texas, Utah,
Washington, and Wyoming

Shelby T. Brewer
Combustion Engineering

Karen Buhr
Las Animas Citizens Against
Radioactive Dumps (LACARD)

Larry Caldwell
Unaffiliated

Christopher J. Daggett
State of New Jersey
Department of Environmental Protection

Edward M. Davis
American Nuclear Energy Council

L. H. Dodgion
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State of Nevada

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Kesley Edmo
The Shoshone-Bannock Tribes

Richard J. Fiesta
Laborers International Union
of North America

Robert Halstead
Bob Robison

Oregon Department of Energy
Frances Close Hart
Energy Research
Foundation (ERF)

Terry Husseman
State of Washington
Department of Ecology

Melinda Kassen
Environmental Defense Fund

Ellen M. Kelly-Lind
Knolls Action Project

George Levin
Unaffiliated

Nancy C. Low
Unaffiliated

K. M. Lu
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Arjun Markhijani, Ph.D.
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Sue Portanova
Unaffiliated

Dan W. Reicher
James D. Werner
Natural Resources
Defense Council

LeRoy N. Shingoitewa
The Hopi Tribe

Theodore Stern
Westinghouse Electric Corporation

William Donald Tahkeal
Yakima Indian Nation (YIN)

Louise Torell
Concerned Citizens of Maywood

Peter T. Torell
International Association of
Machinists and Aerospace Workers
Maury Walsh
Ohio EPA

Arthur L. Williams
Commonwealth of Kentucky
Department of Environmental Protection

List of Commentors on November 1989 Draft
Applied Research, Development, Demonstration, Testing
and Evaluation Plan

Terence H. Bates
SRA Technologies

Eric S. Beckjord
Nuclear Regulatory Commission

Steven C. Beering
Purdue University

Bill Clinton
State of Arkansas

David F. Hales
State of Michigan

Mike Hayden
State of Kansas

David L. Humphrey
State of Idaho

Terry Husseman
State of Washington

Bryce Jordan
Pennsylvania State University

William C. Kelly
University of Michigan

William E. Kirwan
University of Maryland

Paul C. Martin
Harvard University

George S. Mickelson
State of South Dakota

Fernando Lloveras San Miguel
Commonwealth of Puerto Rico

Roger A. Minear
University of Illinois

Wesley W. Posvar
University of Pittsburgh

Anna F. Prager
State of Rhode Island

Eugene H. Roseboom, Jr.
United States Geological Survey

W. J. Sams
Chevron Real Estate Management
Company

Cecil Sanchey
Yakima Indian Nation

Roland Schmitt
Renssalaer Polytechnic Institute

W. E. Splinter
University of Nebraska

APPENDIX C1

Department of Energy
Washington, DC 20585

OCT 2 7 1989

National Research Council
Commission on Physical Sciences,
Mathematics, and Resources
Board on Radioactive Waste Management
2101 Constitution Avenue, N.W.
Washington, D.C. 20418

Attn: Dr. Peter Myers, Staff Director

Gentlemen:

Enclosed herewith is the Department's response to document comments on "Review Comments on Predecisional Draft II of DOE's Environmental Restoration and Waste Management Five-Year Plan" provided by the Board on August 3, 1989. For your convenience, we have retyped the Board's letter and inserted our response and disposition immediately following each individual comment.

I would like to take this opportunity to express once more, on behalf of Admiral Watkins, the Department's thanks for the Board's continued participation in the overall process of developing the Five-Year Plan. The assistance you have given us through your independent review of Draft II has contributed immeasurably to the quality of the final plan and we hope that this will be a continuing process.

Sincerely,

Leo P. Duffy
Special Assistant to the Secretary
for Coordination of DOE
Waste Management

Enclosure

APPENDIX C1

REVIEW COMMENTS ON PREDECISIONAL DRAFT II OF DOE'S ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT FIVE-YEAR PLAN

INTRODUCTION

At the request of the Department of Energy (DOE), the Board on Radioactive Waste Management ("the Board") of the National Research Council has reviewed Predecisional Draft II of the Environmental Restoration and Waste Management Five-Year Plan ("the Plan"). This letter contains the Board's general comments on the Plan and its implications for the new directions that DOE proposes to take.

OVERVIEW

The Plan provides a broad roadmap for cleanup and waste management at DOE's defense production facilities. It encompasses the first five years of a thirty-year effort. The Plan also makes a useful implicit distinction between "old" and "new" waste. In the area of corrective actions (bringing existing sites into compliance), the Plan appears to have made a good start. In the area of environmental restoration (cleaning up past waste), the Plan calls for proceeding with deliberate speed and broad public participation. In the area of waste management (controlling and disposing of current and future waste), the Plan states the need to comply with the letter of the law and advance the state of the art, with particular emphasis on minimization of waste production.

The Plan is an impressive document that reflects credit on the ability and hard work of those who put it together. It also reflects evidence of the much-publicized "change of culture" within DOE. Specifically, the Plan commits DOE to comply with a broad array of regulatory requirements and, for the first time, to the goal of cleaning up all of its sites within the next thirty years. It marks the first step in the development of an agenda against which progress toward these goals can be measured.

Nevertheless, the Board believes that, as the Plan evolves, it needs to be improved in several significant areas:

1. Although the Plan provides a clear statement of the broad goals of DOE's thirty-year cleanup effort, it needs to provide more focused information on the specific, near-term actions that DOE plans to initiate for accomplishment in the first five years, differentiating clearly between environmental restoration and corrective activities on the one hand, and waste management operations on the other.

THE FIVE-YEAR IMPLEMENTATION PLAN TO BE PREPARED BY EACH OPERATIONS OFFICE (SPECIFIED IN SECTION 1.2.1.1) IS INTENDED TO PROVIDE INFORMATION CONCERNING SPECIFIC, NEAR-TERM ACTIONS. THE FOREWORD SUMMARIZES THE DEFINITION OF CORRECTIVE ACTIVITIES, ENVIRONMENTAL RESTORATION, AND WASTE MANAGEMENT OPERATIONS. MORE EXTENSIVE DEFINITIONS ARE SET FORTH IN SECTION 2.0, 3.0, AND 4.0.

2. The Plan should establish explicit, realistic expectations for the cleanup effort and avoid making such broad commitments or promising more than can be delivered.

THIS COMMENT IS WELL NOTED. THE REQUIREMENT FOR FIVE-YEAR IMPLEMENTATION PLANS AND THE DEVELOPMENT OF A NATIONAL PRIORITY SYSTEM IS INTENDED TO RESPOND TO THE ISSUE RAISED BY THE COMMENT.

3. The Plan should spell out more clearly the necessary steps to a widely acceptable and defensible priority ranking system for cleanup activities.

THE CURRENT USE OF FOUR PRIORITY LEVELS IS INTENDED FOR THE INTERIM PERIOD ONLY. SECTION 1.2.2 COMMITS TO THE DEVELOPMENT OF A NATIONAL PRIORITY SYSTEM THAT IS INTENDED FOR USE IN PREPARING FUTURE REVISIONS TO THE PLAN. THESE DEVELOPMENT ACTIVITIES ARE CURRENTLY UNDERWAY. IN ORDER TO BUILD CONSENSUS, THE DEVELOPMENT PROCESS WILL INCLUDE PARTICIPATION OF STATES AND TRIBES.

4. DOE should declare in the Plan its intention to contribute to the national debate on setting sensible and consistent requirements for cleanup and waste management activities. The Plan should describe how DOE intends to accomplish this.

SECTION 1.3.4 COMMITS DOE TO WORK WITH LOCAL, STATE, AND FEDERAL AGENCY REGULATORS TO IMPROVE THE CONSISTENCY WITH WHICH ENVIRONMENTAL REGULATIONS ARE APPLIED TO DOE FACILITIES.

5. The Plan should make explicit the need and intent to develop a balanced program of basic and applied research, development, and training that embraces the entire thirty-year span of its cleanup effort, not just the first five years.

ALTHOUGH NOT SPECIFYING A SPECIFIC TIME PERIOD, SECTION 1.3.5 COMMITS DOE TO INCREASE ITS INVESTMENT IN AND ESTABLISH A NATIONAL APPLIED PROGRAM FOR R&D IN ORDER TO RESOLVE EXISTING TECHNICAL ISSUES AND ADVANCE THE STATE OF WASTE MANAGEMENT AND CLEANUP TECHNOLOGIES. SECTION 1.3.3 ADDRESSES DOE'S INTENT TO PROVIDE FOR HUMAN RESOURCE DEVELOPMENT, MOTIVATION, AND ALLOCATION (INCLUDING TRAINING).

6. The Plan notes the need for public participation in DOE's environmental planning and cleanup activities, but should be expanded to include a more effective involvement of a broader set of participants.

THIS COMMENT IS WELL NOTED. SECTION 1.2.1.2 COMMITS DOE TO REQUESTING THE PARTICIPATION OF AFFECTED STATES, INDIAN TRIBES, AND THE PUBLIC IN THE PLANNING AND IMPLEMENTATION PROCESS AT THE OPERATIONS OFFICE AND SITE LEVELS. DOE RECOGNIZES THAT A BROAD SET OF SUCH PARTICIPANTS REPRESENTING A NUMBER OF VIEWPOINTS IS DESIRABLE AND NECESSARY FOR BUILDING CONSENSUS. THE DEPARTMENT IS EVALUATING A NUMBER OF OPTIONS FOR EXPANDING PARTICIPATION OF SUCH GROUPS IN PLANNING AND CLEANUP ACTIVITIES.

7. The Plan should discuss possible changes in DOE's organizational structure to facilitate achievement of its environmental objectives.

SECTION 1.3.1.2 STATES THE NEED OF AN INTEGRATED ENVIRONMENTAL RESTORATION, WASTE MANAGEMENT, AND R&D ORGANIZATION WITHIN DOE HEADQUARTERS. THE SECRETARY IS CURRENTLY EVALUATING VARIOUS OPTIONS TO BEST CONFIGURE THIS ORGANIZATION. THE EXTENT TO WHICH OTHER GROUPS ARE TO PARTICIPATE IS UNDER REVIEW BY THE DEPARTMENT.

The Board supports DOE's efforts to solicit direct involvement of States and Indian Tribes from the earliest stages of this planning process. We urge DOE to maintain these contacts and to expand them to include the participation of other interested parties, including regulatory agencies, local governments, environmental, and other groups.

SECTION 1.2.1.2 COMMITS DOE TO THE BROAD PARTICIPATION OF AFFECTED STATES, INDIAN TRIBES, AND THE PUBLIC IN THE PLANNING AND IMPLEMENTATION PROCESS. SECTION 1.3.4 FURTHER COMMITS DOE TO WORK WITH LOCAL, STATE, AND FEDERAL AGENCY REGULATORS TO IMPROVE THE CONSISTENCY WITH WHICH ENVIRONMENTAL REGULATIONS ARE APPLIED TO DOE FACILITIES. SEE ALSO RESPONSE TO #7, ABOVE.

The Board commends DOE for beginning to distinguish between the urgent and the deliberate. The Plan distinguishes between actions that are already under way or must be taken at once--to respond to immediate threats to the public health and the environment, to reduce overall costs, or to comply with clear legal requirements--and those activities that can or should proceed at a more deliberate pace. An example of this distinction would be the decision to clean up an immediate threat using whatever technology is at hand, while at the same time developing new technologies that will make future cleanups more effective and less costly. The Board believes that DOE should develop and apply this distinction more broadly as a way of describing other elements of the Five-Year PLan. We are not advocating delay. Projects that would benefit from a deliberate approach should certainly be initiated, and DOE should still set firm goals, but full commitment to and implementation of specific remediation techniques and outcomes must, in many cases, await a clearer understanding of what the problems are, what the goals or regulatory requirements are, and what can be achieved at what cost. Often, due to the many unknowns involved, a phased cleanup is appropriate, rather than full commitment at the start to a single technology.

THE DEPARTMENT WOULD AGREE WITH THIS COMMENT. HOWEVER, THE SCOPE AND PACE OF THE MANAGEMENT, CLEANUP, AND ULTIMATE DISPOSAL OF RADIOACTIVE AND MIXED WASTES ARE GENERALLY GOVERNED BY THE REGULATORY PROCESS, PARTICULARLY THE PROCESSES PRESCRIBED UNDER RCRA, NEPA, AND CERCLA. UNDER RCRA, THE PROCESS FOR OBTAINING PERMITS AND NEGOTIATING CONSENT AGREEMENTS CAN PROVIDE FOR A PHASED APPROACH. SIMILARLY, NEPA ALSO MAY PROVIDE FOR A PHASED APPROACH. HOWEVER, UNDER CERCLA THE OPPORTUNITY TO USE SUCH AN APPROACH IS LIMITED. TO THE EXTENT THAT THE REGULATORY PROCESS ALLOWS FOR A PHASED APPROACH, THE DEPARTMENT WOULD LIKELY ADOPT SUCH MEASURES WHEN JUSTIFIED.

Most privately-owned hazardous waste sites, while contaminating the environment, represent very low current risk to public health but with the potential for future risk. DOE believes that the contamination at most of its waste sites also presents no substantial immediate risk to the health of either workers or the general public. Because this belief directly affects the urgency of DOE action, it should be explicitly and openly discussed in the Plan and with affected parties, and should undergo peer review. This belief is also the reason why most of the environmental restoration activities outlined in the Plan, like those of the private sector, will be driven by the need to comply with environmental regulations, and not by the need to reduce extrapolated health risks since these are not high relative to other environmental risks the public faces. It is prudent, therefore, to ensure that this driving force--technical compliance with the law--is clearly understood, and to proceed deliberately, including careful evaluation of alternative cleanup strategies.

THE DEPARTMENT WOULD AGREE WITH THIS COMMENT, AND ITS SENTIMENT IS STATED IN ONE FORM OR ANOTHER THROUGHOUT THE FIVE YEAR PLAN. THE SECOND SENTENCE IN THE FORWARD STATES "IT IS DOE'S POLICY THAT FULL COMPLIANCE WITH THE LETTER AND SPIRIT OF ENVIRONMENTAL LAWS, REGULATIONS, AND REQUIREMENTS IS AN INTEGRAL PART OF OPERATING DOE FACILITIES."

SPECIFIC BOARD FINDINGS

Objectives

The stated objective of DOE's thirty-year cleanup program 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" (page 1). The purpose of the Five-Year Plan, in turn, is "to establish an agenda against which progress will be measured" (p. 1-2). The agenda includes a list of "proposed actions"--"implement programs to minimize present waste generation," "identify and fix the problems for which technology exists," etc.--that are good examples of the goals that DOE expects to achieve in the first five years (pp. 1-4 and 1-5).

In both the Plan and DOE's presentations to the Board, it is clear that DOE has a number of additional short-term goals, including to "revitalize DOE culture" and "gain public trust and confidence," as well as additional long-term goals, such as "preserve environmental resources." The Board suggests that the Plan should identify these objectives clearly and explicitly, distinguishing among those applicable to the varying requirements of environmental restoration, correction activities, and waste management operations. This would help to provide a sound basis for the development of a priority ranking system (see below) and make clear DOE's intention to operate its production facilities in an environmentally sound manner while cleanup proceeds.

SECTION 1.1.1 SETS FORTH A TWELVE-POINT AGENDA OF PROPOSED ACTIONS AS PART OF ITS COMMITMENT TO CLEAN UP AND RESTORE THE ENVIRONMENT AT ITS NUCLEAR SITES, TO REVITALIZE ITS INTERNAL CULTURE, AND TO BREAK WITH THE DYSFUNCTIONAL ASPECTS OF ITS PAST ACTIVITIES AND CORPORATE POSTURE. SECTION 1.1.2 FURTHER COMMITS DOE

TO CHANGING ITS PRODUCTION-ORIENTED CULTURE TOWARD A CULTURE OF OPEN COMMUNICATION, CLEAR PRIORITIES, AND ACCOUNTABLE MANAGEMENT. IT IS INTENDED THAT THE PRIORITIZATION SYSTEM, CURRENTLY UNDER DEVELOPMENT, INCORPORATE SUCH CONCEPTS.

Expectations

While the Board recognizes the need for early successes in order to build confidence and momentum, it cautions DOE that this need will not be met if the Plan raises expectations on the part of stakeholder groups by promising too much, too soon. From DOE presentations to the Board, it appears that DOE may be promising more than it can accomplish--especially in areas where the full extent of the problem has not yet been characterized, where the level of cleanup has not been determined, and where the necessary technology is not yet in hand or has not been carefully evaluated. Under these conditions, the procedures needed for achieving "full compliance with the letter and spirit of [all applicable] environmental laws, regulations, and requirements" at the "Federal, State, and local" levels (pp. i and 1-6) may be ambiguous and/or very difficult and costly if action is taken prematurely. Some of the laws and regulations may work at cross purposes in detailed application.

THE DEPARTMENT WOULD AGREE WITH THIS COMMENT. THE FULL PARTICIPATION OF THE STATES, INDIAN TRIBES, AND PUBLIC IN THE DEVELOPMENT OF FIVE-YEAR IMPLEMENTATION PLANS AND THE DEVELOPMENT OF A NATIONAL PRIORITY SYSTEM IS INTENDED TO RESPOND TO THIS CONCERN.

The Board commends DOE for including in the Plan a list of specific proposed near-term accomplishments (pp. 1-34 and 1-35), but it strongly urges DOE to review these targets in order to be sure that they can actually be accomplished in the time stated. Because of the nations's high expectations for rapid progress in cleaning up DOE's facilities, the Plan must make clear what can and cannot be accomplished in the short term. The Plan must also demonstrate that DOE will be a wise steward of the large and rapidly increasing sums of public money being directed to environmental restoration. The credibility of DOE will suffer in the long run if, after five years, large sums of money have been spend with what are perceived to be meager results, especially when compared with the expectations of the Congress, the public, and the technical community.

IN ITS PREPUBLICATION FINAL DRAFT OF THE FIVE-YEAR PLAN, THE DEPARTMENT HAS DELETED THE SPECIFIC COMMITMENTS CONCERNING THE NEAR-TERM ACCOMPLISHMENTS SET FORTH IN SECTION 1.4. HOWEVER THE MILESTONES SET FORTH IN SECTIONS 2.0 AND 4.0 AND THE APPENDICES FOR CORRECTIVE ACTIVITIES, ENVIRONMENTAL RESTORATION, AND WASTE MANAGEMENT OPERATIONS ARE RETAINED. BASED ON OPERATIONS OFFICE INPUT, THE ORGANIZATIONS RESPONSIBLE FOR IMPLEMENTING THE PROGRAMS, SUCH MILESTONES ARE BELIVED TO REPRESENT REALISTIC GOALS.

Setting of Priorities

The Board concurs that the development of a priority ranking system with input from the affected parties is of crucial importance. Not all waste sites can be cleaned up immediately, so some method is needed to choose the order of cleanup. The process of setting priorities will help to clarify DOE's goals and

SECTION 1.2.1.2 SETS FORTH A SCHEDULE WHICH CALLS FOR INITIATION OF A NATIONAL PRIORITIZATION SYSTEM BY MARCH-APRIL 1990.

NPS will also provide a tangible demonstration of DOE's new openness. In order to obtain maximum agreement among all of the stakeholders (including DOE contractors and employees), each group must be a significant party in the development of NPS, including the factors to be considered, weighting of factors, and so on. NPS will be useful only if it is developed through a credible process. (The Board believes that decision theory provides a good framework for such a system, but even this choice should be subject to consultation with the stakeholders.) At present the Plan fails to describe a process for ensuring broad public participation in NPS, or for linking the results to action program decisions.

SECTION 1.2.1.2 PROVIDES FOR A PROCESS WHEREBY GROUPS SIMILAR TO THE STATE AND TRIBAL GOVERNMENT WORKING GROUPS THAT ASSISTED IN THE PREPARATION OF THE FIVE-YEAR CAN PARTICIPATE IN THE FORMULATION OF A NATIONAL PRIORITIZATION SYSTEM.

More importantly, the Plan does not recognize how much time it will take to develop a proper system for setting priorities. The proposed schedule allows only seven months to develop and initiate NPS (p. 1-12), the Board believes that to do it right, with public participation, will take more than twice that long. DOE has set itself a deadline of April 1, 1990, which the Board considers premature and urges DOE to abandon. If DOE needs some input for the current budget cycle, it might consider an incremental approach: select a smaller part of the overall program for completion by April, then do the rest of it for the next budget cycle. Interaction between DOE and the stakeholders should be an iterative process in any event.

AS STATED IN SECTION 1.2.1.2, THE SCHEDULE FOR DEVELOPMENT OF THE NATIONAL PRIORITIZATION SYSTEM IS, ADMITTEDLY, OPTIMISTIC. HOWEVER, THE DEPARTMENT IS MAKING EVERY EFFORT TO MEET THE TIMETABLE IT HAS SET FOR ITSELF. WE NOW ARE PLANNING TO HAVE A PRIORITY SYSTEM AVAILABLE FOR 92 BUDGET INPUT.

Note that the Board has not defined the stakeholders, but they do include groups other than States and Indian Tribes, including federal agencies, contractors, and communities near DOE sites, as well as environmental and public interest groups. The Board's advice on this point--take the time to do it right, and involve a broader range of outside parties--is basically the same advice that it has given DOE on a number of other issues (Board on Radioactive Waste Management Letter Reports dated 1985, 1985A and 1986). In this case, as before, prioritization should not go forward without public participation (see below).

THE DOE IS COMMITTED TO THE PARTICIPATION OF THE STATES AND INDIAN TRIBES IN THE DEVELOPMENT OF A NATIONAL PRIORITY SYSTEM. THE NATURAL RESOURCES DEFENSE COUNCIL, ENVIRONMENTAL DEFENSE FUND AND THE ENVIRONMENTAL PROTECTION AGENCY HAVE RECENTLY BEEN INVITED TO PARTICIPATE.

An initial meeting was held on October 18-19, 1989 with representatives of: nine Governor's; two Indian Tribes; the National Governors Association; the National Association of Attorneys General; the National Conference of State

Legislators; the Natural Resources Defense Council; the Environmental Defense Fund; the Environmental Protection Agency; and the Department of Energy to gain a broader perspective from which to develop the prioritization methodology. This is the first of many anticipated meetings to address the development of a NPS.

Sensible and Consistent Requirements for Cleanup and Compliance

The Board understands the challenge to DOE stemming from the "inconsistency of environmental regulations" (p. 1-28), both among various Federal requirements (e.g., RCRA, CERCLA and NEPA) and among Federal, State, and local requirements. The Board also sympathizes with the Plan's call for "consistent national regulatory standards" (p. 1-28). DOE has only recently begun the transition from a self-regulating entity to one that is externally regulated, on the same footing as other public agencies and private corporations. As a result, DOE is only now facing the kind of challenges on this score that other regulated entities have faced for longer periods. In DOE's case, the situation is further complicated by the fact that it often faces a more diverse set of problems, involving both radioactive and chemical substances, than do other regulated parties. In this regard, the Board suggests that the Plan should reflect the following points:

1. The Board believes that DOE has an obligation to participate, as an affected party, in rule-making and legislative initiatives that affect its mission. At lease some of its current difficulties are the result of standing on the sidelines in the past. Active, high-level participation--both in rule-making related to health and environmental standards for radiation and chemicals, and in legislative revisions governing these general areas--will help to ensure that DOE's concerns are clearly known by the appropriate authorities. With few exceptions, such as the pending revisions on 40 CFR 191, this is a long-term initiative and is not likely to change the present regulatory situation significantly during the five-year period covered by the current Draft Plan.

THE DEPARTMENT AGREES WITH THIS COMMENT. SECTION 1.3.4 SETS FORTH THE BROAD SCOPE OF DOE'S PLANNED PARTICIPATION IN RULE-MAKING AND REGULATORY INITIATIVES TO IMPROVE THEIR CONSISTENCY OF APPLICATION.

2. The Plan's priority-setting process can help to identify and direct attention to ambiguities, inconsistencies, and areas where applicable regulations point to remedies that do not appear to be sensible or cost-effective. DOE should not allow these problems to interfere with the development of NPS (see above). Through consultation and negotiation, DOE and the other affected parties can determine appropriate management of site-specific DOE waste problems in a legal and regulatory setting that is not entirely self-consistent.

THE DEPARTMENT AGREES WITH THIS COMMENT. ALTHOUGH THE DEPARTMENT DOES NOT YET KNOW THE EXTENT TO WHICH THE NATIONAL PRIORITY SYSTEM WILL HIGHLIGHT REGULATORY AMBIGUITIES AND INCONSISTENCIES, THE DEPARTMENT DOES NOT INTEND TO ALLOW SUCH AMBIGUITIES AND INCONSISTENCIES TO IMPEDE THE DEVELOPMENT OF THE SYSTEM. FURTHER, WORKING WITH VARIOUS CONCERNED GROUPS, THE DEPARTMENT INTENDS TO BUILD A BROAD NATIONAL CONSENSUS CONCERNING GOALS, OBJECTIVES, AND IMPLEMENTATION (SECTION 1.1.3) AND TO WORK WITH LOCAL, STATE, AND FEDERAL AGENCIES TO IMPROVE THE CONSISTENCY WITH WHICH ENVIRONMENTAL REGULATIONS ARE APPLIED (SECTION 1.3.4).

DOE BELIEVES THE INTERAGENCY AGREEMENTS OR FEDERAL FACILITY AGREEMENTS THUS FAR REACHED AMONG DOE AND LOCAL, STATE, AND FEDERAL AGENCIES OFFER A NEAR-TERM MECHANISM FOR IMPROVING SUCH CONSISTENCY.

3. In the longer term, the Board supports the Plan's general goal of striving toward "technically sound, risk-based standards" (p. 1-28) with the observation that what is meant is really risk-based environmental requirements rather than "standards." DOE should study this issue and join with other public and private groups in ongoing efforts aimed at the rationalization of environmental requirements. The Board stresses that this will involve many parties, including the Congress, and that it will take a long period of time.

THE DEPARTMENT AGREES WITH THIS COMMENT. DOE PLANS TO WORK WITH LOCAL, STATE, AND FEDERAL AGENCY REGULATORS TO IMPROVE THE CONSISTENCY WITH WHICH ENVIRONMENTAL REGULATIONS ARE APPLIED TO DOE FACILITIES. (SEE ALSO, THE IMMEDIATELY PRECEDING RESPONSE.)

Research, Development, and Technology Transfer

THE BROAD FRAMEWORK FOR ESTABLISHING AN APPLIED RESEARCH AND DEVELOPMENT PROGRAM IS SET FORTH IN SECTION 1.3.5. HOWEVER, THE COMMENTS WITH RESPECT TO RESEARCH, DEVELOPMENT, AND TECHNOLOGY TRANSFER GENERALLY CONCERN ISSUES THAT ARE UNDER CONSIDERATION AS PART OF THE FIVE-YEAR PLAN FOR R&D ACTIVITIES (CURRENTLY UNDER DEVELOPMENT AND SCHEDULED FOR COMPLETION BY MID-DECEMBER 1989). BROADLY, THE R&D PROGRAM WILL HAVE TWO MAJOR COMPONENTS: A DOE LABORATORY PROGRAM OF APPLIED RESEARCH AND A SERIES OF REGIONAL UNIVERSITY CONSORTIA. THE APPLIED RESEARCH PROGRAM WILL INVOLVE, AMONG OTHER THINGS, THE DEMONSTRATION, TESTING, AND EVALUATION OF NEW TECHNOLOGIES AS WELL AS TECHNOLOGY TRANSFER. THE REGIONAL UNIVERSITY CONSORTIA WILL BE CONCERNED MORE WITH CURRICULUM DEVELOPMENT, INTERN PROGRAMS, DISTINGUISHED SCIENTIST PROGRAMS, AND GRADUATE RESEARCH. MAJOR RESEARCH INITIATIVES WILL FOCUS ON FOUR AREAS: (1) WASTE MINIMIZATION, (2) DEVELOPMENT OF IMPROVED ENVIRONMENTAL RESTORATION TECHNOLOGIES, (3) APPLICATION OF ROBOTICS AND AUTOMATED SYSTEMS TECHNOLOGIES, AND (4) ADAPTATION OF EXISTING TECHNOLOGIES.

The Plan correctly emphasizes a vigorous program of applied R&D, bringing into early use the best relevant technology that currently exists or that is close to application. There may be no panaceas available, but there are promising candidates that can make DOE's efforts more effective in the long term. In many respects, however, the real needs in the near term--and indeed, the activities described--are not so much research as they are technology development, application, and especially technology transfer, designed to identify and take advantage of existing technologies that were initially developed for other purposes.

DOE is to be commended for going outside the Department to capture new approaches and innovative ideas. The Board urges that the Plan, in its R&D and technology transfer program, make full use of technical advances that have been made by waste management programs at the EPA, in the chemical industries, and in other countries. The Plan is silent on this score, except with regard to basic research (p. 5-16). Specifically, the Plan should describe how DOE will participate in international development and exchange of regulations, technology, and research results.

The Board notes that the accumulation of incremental improvements to existing operational practices made by contractors can potentially be a key source of innovation over the projected thirty-year life of the program. The Board urges that the Plan provide appropriate incentives to DOE contractors to seek out and implement such improvements. This is particularly important given the inertia of the regulatory environment. The Board further recommends that the Plan provide incentives for the rapid communication of these advances to other sites. A specific plan or mechanism will be required to accomplish this. Even though much of the learning-by-doing may be site-specific, there are likely to be amply opportunities for intersite cross-fertilization of ideas and practices.

The Plan's intention to develop research consortia involving universities working with the national laboratories and industry is potentially valuable. Care should be taken in structuring the university involvement to ensure maximum effectiveness of the university system, nationwide (not just close to DOE labs), and by stimulating the supply of additional well-trained scientists and engineers. An important element of the research program should be a system of grants to fund unsolicited proposals, subject to peer review similar to that used in the Department's own energy research program and by other Federal agencies. This would help to ensure the broadest possible involvement of creative minds and availability of new ideas in support of these environmental programs. The program should also include applied research involving consortia of universities and industry, with DOE funding provided on a cost-sharing basis, again with peer review of proposals. It is critically important that the research initiative include three features:

1. The Plan should clearly describe to the universities the nature, objectives, and structure of its research programs;
2. The Plan should provide for discussions with other agencies that fund extramural research; and
3. DOE should actively disseminate the results of research conducted at the universities and at the national laboratories, making sure site operators are adequately informed of developments that can be applied to their needs.

The Board also recommends that the Plan take note of the various studies that have been conducted in the recent past to examine possibilities for most effectively increasing the supply of scientists, engineers, and technicians. DOE cannot assume that the requisite manpower will be available, and the Plan should consider the possible benefits of developing appropriate training programs.

Public Participation

The Plan recognizes the need for more open and effective public communication and for greater opportunities for public involvement in DOE planning and decision-making. The Department has recognized the opportunity "to give this agenda national visibility and to begin building national consensus" through review of the Plan by States, Indian Tribes, and the National Academy of Sciences (p. 1-18). The Plan also states DOE's commitment to change, including commitments to an open participatory process for developing a national priority system, communicating in terms that are understandable to the public, listening to its critics, and changing its culture from one of secrecy to one of openness. Among the specific goals spelled out by the Plan are "to establish public confidence in [DOE's] ability to operate its facilities without posing a threat to public and worker health and the environment" and "to raise the confidence level of the public by presenting a plan that addresses their concerns" (p. 1-16).

These objectives are to be applauded, but they will not be easy to achieve. Although a start has been made--certainly the desire to communicate effectively is reflected in the clear language of the plan--the Board urges that the Plan give more specific consideration to the steps needed to implement this commitment, including the following:

1. The Plan should approach communication and public participation in the same way that technical elements of the program are approached: i.e., as an effort involving strategic planning and resource allocation, research and development, acquisition of human resources, training (e.g., communication skills), and evaluation of results.

SECTIONS 1.2.1.1 AND 1.2.1.2 DISCUSS THE DEPARTMENT'S OVERALL APPROACH TO THE PLANNING AND IMPLEMENTATION PROCESS AND TO ITS COMMITMENT TO STATE, TRIBAL, AND PUBLIC PARTICIPATION THEREWITH. BECAUSE OF DOE'S PAST PERFORMANCE IN THIS REGARD, THE MECHANISMS FOR RECEIVING SUCH PARTICIPATION ARE NOT WELL DEVELOPED; AND THE DEPARTMENT IS CURRENTLY REVIEWING A NUMBER OF APPROACHES FOR ENSURING FULL PARTICIPATION BY ALL DESIGNATED GROUPS. IN AN ATTEMPT TO OBTAIN MAXIMUM INPUT, A 90-DAY PUBLIC COMMENT PERIOD WAS ESTABLISHED IN THE FEDERAL REGISTER NOTICE.

2. In improving public communication and participation, the Plan should draw from other programs in DOE and from other organizations--e.g., the New Jersey Department of Environmental Protection (especially in the case of radon) and EPA (especially in the case of Superfund)--that have more experience, both successful and less successful, in dealing effectively with the public on environmental issues. There may also be lessons to be learned from industry's experience in public communication on environmental concerns.

THE DEPARTMENT AGREES WITH THIS COMMENT. IT IS EXPECTED THAT THE ANNUAL REVISIONS OF THE FIVE-YEAR PLAN WILL INCREASINGLY DRAW FROM THE EXPERIENCE OF OTHERS AND THE PLANS FOR THE 1991 WILL INCLUDE OTHER CONCERNED GROUPS AND HOPEFULLY A CONSENSUS WILL EVENTUALLY BE ESTABLISHED.

3. The Plan should show that explicit responsibility for public communication and involvement activities will be shared by senior DOE officials and not merely delegated to junior staff or people outside the decision-making loop. Performance incentives might reflect the importance of effective public communication and involvement.

SECTION 1.1.2 COMMITS THE DEPARTMENT TO A CHANGING CULTURE THAT INCLUDES A "COMMITMENT TO OPEN, CANDID PUBLIC COMMUNICATION.." FURTHERMORE, SECTION 1.1.2 STATES THAT THE MANAGEMENT STRUCTURE OF THE DEPARTMENT WILL BE BASED ON CLEAR ASSIGNMENT OF RESPONSIBILITY AND ACCOUNTABILITY AND THAT DOE WILL ADDRESS ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT ISSUES "UP FRONT AND FROM THE TOP DOWN." THE DEPARTMENT INTENDS FULL PUBLIC PARTICIPATION IN ITS PLANNING AND IMPLEMENTATION PROCESS.

4. The Plan should include integration of the public communication and involvement schedule with the technical program in order to be certain that time and resources are available for effective interaction and to ensure that public input will not be isolated and will contribute to real decisions.

THE DEPARTMENT AGREES WITH THIS COMMENT. HOWEVER, IT SHOULD BE NOTED THAT THE SCOPE AND PACE OF THE PROGRAMS ADDRESSED BY THE PLAN ARE PRESCRIBED BY REGULATORY PROCESSES. THESE PROCESSES PROVIDE FOR AND SPECIFY THE CIRCUMSTANCES OF PUBLIC INVOLVEMENT.

5. The Plan needs to recognize that there are multiple parties with whom DOE needs to speak. While it is essential that DOE establish and maintain a dialogue with States and Indian Tribes, there are other groups and individuals who have a stake in the problem or who can contribute to a solution. The Plan should identify these groups and make more explicit the procedures for involving them. Such groups include national environmental and public interest groups, county and local governments and organizations, scientific and technical organizations, the media, scientists outside the program, and citizens living near DOE facilities.

THE DOE IS COMMITTED TO THE PARTICIPATION OF THE STATES AND INDIAN TRIBES IN THE DEVELOPMENT OF A NATIONAL PRIORITY SYSTEM. THE EXTENT TO WHICH OTHER GROUPS ARE TO PARTICIPATE IS UNDER REVIEW BY THE DEPARTMENT. BECAUSE OF DOE'S PAST PERFORMANCE IN THIS REGARD, THE MECHANISMS FOR RECEIVING SUCH PARTICIPATION ARE NOT WELL DEVELOPED; AND THE DEPARTMENT IS CURRENTLY REVIEWING A NUMBER OF APPROACHES FOR ENSURING FULL PARTICIPATION BY ALL DESIGNATED GROUPS.

6. Future iterations of the Plan should take advantage of research, mostly funded by NSF and EPA, on risk communication. The National Research Council has many useful recommendations in its upcoming report Improving Risk Communication (September 1989).

THIS COMMENT MAY HAVE IMPORTANT IMPLICATIONS WITH RESPECT TO THE FIVE-YEAR R&D PLAN. THE SPECIFIC REFERENCE TO RISK COMMUNICATION MAY BE OF USE IN PERFECTING THE NATIONAL PRIORITY SYSTEM.

DOE Organization

The Plan recognizes that the current organization of the Department of Energy has developed under conditions in which self-regulation, decentralized management, and production-orientation have dominated the Department's view of its mission. This organization and orientation have led to what is now considered to be less than effective environmental protection. The Plan notes that DOE must now examine whether its organizational structure complements its new goals and objectives. The Board suggests making explicit in the Plan a distinction already implicit in the management of waste:

1. New Waste. -- The responsibility for minimization of future waste production and effective management of ongoing waste streams should remain in the hands of facility operators. These activities should become an integral part of their normal operations, with the provision of suitable incentives and disincentives, as well as appropriate oversight and audit inspections by Headquarters. Such a policy in the Plan would establish procedures consistent with those followed by industry, and would be integrated into the Department's new management plan production.

THE DEPARTMENT AGREES WITH THIS COMMENT. THE PLAN IS NOT INTENDING TO OTHERWISE REMOVE THE RESPONSIBILITY FOR THE MINIMIZATION OF FUTURE WASTE PRODUCTION AND EFFECTIVE MANAGEMENT OF ONGOING WASTE STREAMS FROM THE HANDS OF FACILITY OPERATORS. HOWEVER, THE LANGUAGE OF THE PLAN IS INTENDED TO PROVIDE FOR APPROPRIATE HEADQUARTERS OVERSIGHT AND AUDIT INSPECTIONS.

2. Old Waste. -- In the case of corrective activities and environmental restoration, the Board suggests that the Plan call for strong Headquarters oversight. These new initiatives are less integral to production activities, and setting of priorities in particular is a Headquarters function (see above). Centralized attention will be needed to maintain an aggressive, consistent, and cost-effective program over the thirty-year period that DOE estimates is needed to achieve acceptable site remediation.

SECTION 1.3.1.2 STATES THE NEED OF AN INTEGRATED ENVIRONMENTAL RESTORATION, WASTE MANAGEMENT, AND R&D ORGANIZATION WITHIN DOE HEADQUARTERS. (CORRECTIVE ACTIVITIES WILL BE MANAGED BY THE DOE PROGRAM OFFICE HAVING RESPONSIBILITY FOR THE OPERATION OF THE FACILITY CONCERNED; SEE SECTION 2.1.1). THE SECRETARY IS CURRENTLY EVALUATING VARIOUS OPTIONS TO BEST CONFIGURE THIS ORGANIZATION. THE EXTENT TO WHICH OTHER GROUPS ARE TO PARTICIPATE IS UNDER REVIEW BY THE DEPARTMENT.

CLOSING STATEMENT

The Board appreciates the opportunity to contribute to this planning effort and stands ready to participate in and review the program as it progresses. The Board has concluded that four elements will be crucial to the success of the Plan, and it looks forward to working with DOE in these areas:

a credible method of setting priorities;

sensible and consistent requirements for cleanup;

appropriate research, development, and technology transfer, and widespread public participation.

In conclusion, the Board wishes to emphasize the following points:

1. The Plan needs to make clear the objectives of DOE's environmental restoration and waste management programs.

2. 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.

3. DOE, as an affected party, needs to describe in the Plan how it intends to participate in rule-making and legislative initiatives to make sure its concerns are clearly understood.

4. DOE needs to describe how it will participate in international development and exchange of regulations, technology, and research results.

5. Finally, the Plan must emphasize more strongly that public participation in all phases of the program is essential for success.

APPENDIX D

LISTS OF

AGREEMENTS, DECREES, ORDERS, AND ENFORCEMENT ACTIONS

FEDERAL AND STATE AGREEMENTS*

Facility	Regulator	Statute(s)	Date
Savannah River Site	South Carolina	CAA	02/27/79
Oak Ridge Y-12 Plant	EPA	CAA	04/12/82
Savannah River Site	South Carolina	CWA	01/03/84
Savannah River Site	South Carolina	SDWA	11/28/84
Oak Ridge Y-12 Plant	EPA	CWA	04/17/83
Savannah River Site	South Carolina	SDWA	06/12/85
Savannah River Site	South Carolina	RCRA	07/19/85
Kansas City Plant	EPA	CERCLA	09/30/85
Savannah River Site	South Carolina	RCRA	11/07/85
Oak Ridge National Laboratory	EPA	CWA	02/12/86
Savannah River Site	South Carolina	CWA	06/20/86
Feed Materials Production Center	EPA	CERCLA/ RCRA/CAA	07/19/86
Rocky Flats Plant	EPA/Colorado	CERCLA/RCRA	07/31/86
Weldon Spring Site	EPA	CERCLA/NEPA	08/22/86
Portsmouth Gaseous Diffusion Plant	EPA	RCRA	09/30/86
Hanford	Washington	RCRA	10/01/86
Savannah River Site	South Carolina	RCRA	10/06/86
Savannah River Site	South Carolina	CWA	10/06/86
Savannah River Site	EPA	CAA	01/23/87
Lawrence Livermore National Lab	EPA	TSCA	03/19/87
Savannah River Site	South Carolina	RCRA	05/01/87
Idaho National Engineering Lab	EPA	RCRA	07/10/87
Savannah River Site	EPA	RCRA	07/30/87
Savannah River Site	South Carolina	CAA	09/04/87
Brookhaven National Lab	EPA	TSCA	09/04/87
Savannah River Site	South Carolina	SDWA	09/09/87
Lawrence Livermore National Lab (Site 300)	California	CWA(cleanup)	09/25/87
Paducah Gaseous Diffusion Plant	Kentucky	CWA	09/28/87
Savannah River Site	South Carolina	SDWA	10/07/87
Savannah River Site	South Carolina	RCRA	11/12/87

Savannah River Site	South Carolina	RCRA	11/12/87
Savannah River Site	South Carolina	RCRA	12/29/87
Western Area Power Administration	EPA	RCRA	12/30/87
Naval Petroleum Resources - California	EPA	CAA	02/04/88
Great Plains Gasification Plant	EPA/North Dakota	CAA	03/25/88
Lawrence Livermore National Lab	EPA/California	CERCLA	11/01/88
Paducah Gaseous Diffusion Plant	EPA	CERCLA	11/04/88
Savannah River Site	South Carolina	RCRA	11/23/88
Monticello Mill Site/ Vicinity Properties	EPA/Utah	CERCLA	12/22/88
Los Alamos National Lab	EPA	CWA	02/13/89
Savannah River Site	South Carolina	RCRA	02/16/89
Hanford Site	EPA/Washington	CERCLA/RCRA	05/15/89
Kansas City Plant	EPA	RCRA	06/23/89
Rocky Flats Plant	Colorado	RCRA	07/14/89
Rocky Flats Plant	EPA/Colorado	RCRA	09/19/89
Portsmouth Gaseous Diffusion Plant	EPA	CERCLA/RCRA	09/27/89
Rocky Flats Plant	Colorado	RCRA	11/3/89
Savannah River Site	South Carolina	RCRA	12/12/89
Sandia National Lab	New Mexico	RCRA	12/29/89
Savannah River Site	South Carolina	CWA	02/26/90
Hanford	EPA	TSCA	03/27/89
Feed Materials Production Center	EPA	CERCLA	04/10/90

* Total of 53 Agreements (Agreements include Federal Facility Compliance Agreements, Federal Facility Agreements, Settlement Agreements, Consent Orders

APPENDIX D

FACILITIES CURRENTLY NEGOTIATING CLEANUP/COMPLIANCE AGREEMENTS

Facility	Parties	Statute
Pagano Salvage Yard	Pagano	CERCLA
Feed Materials Production Center	EPA	CAA
Lawrence Livermore National Lab (Site 300)	EPA	RCRA
Los Alamos National Lab	New Mexico	RCRA
Idaho National Engineering Lab	EPA/Idaho	CERCLA/RCRA
Mound Plant	Ohio	RCRA
Rocky Flats Plant	EPA/Colorado	CERCLA/RCRA
Savannah River Plant	EPA/South Carolina	CERCLA/RCRA
Oak Ridge Y-12/Oak Ridge National Lab/ Oak Ridge GDP	EPA/Tennessee	RCRA/CERCLA
Maywood Site	EPA	CERCLA
W.R. Grace Wayne Site	EPA	CERCLA
Brookhaven National Lab	EPA/New York	CERCLA
South Valley Superfund Site (AL)	DOD/GE	CERCLA (2 agreements)
Paducah GDP*	EPA/Kentucky	RCRA/CERCLA
Mound Plant	EPA	CERCLA
Pantex Plant	EPA	RCRA
St. Louis Airport Site	EPA	CERCLA
West Valley Site	EPA/New York	RCRA
Weldon Spring Site	EPA	CERCLA
Savannah River Site	EPA/South Carolina	RCRA
Savannah River Site	South Carolina	RCRA (2 agreements)
Savannah River Site	South Carolina	FWPCA (2 agreements)
Rocky Flats	EPA	FWPCA
Paducah/Portsmouth/ Oak Ridge GDP	EPA	TSCA
Idaho National Engineering Lab	Idaho	RCRA

*EPA issuing cleanup requirements in draft HSWA permit. Negotiations are currently in context of DOE comments and input for final HSWA permit.

STATE CONSENT DECREES

Facility	Regulator	Statute(s)	Date Executed
Savannah River	State of SC*	RCRA	05/26/88
Fernald	State of Ohio	RCRA, CERCLA, CWA	12/2/88
Fernald	State of Ohio	CAA	12/2/88
Portsmouth Gaseous Diffusion Plant	State of Ohio	RCRA	08/31/89

* Other parties include NRDC, South Carolina League of Women Voters, Energy Research Foundation, Georgia Conservatory.

APPENDIX D

UNILATERAL ENVIRONMENTAL ORDERS*

Facility	Regulator	Statute	Date
Oak Ridge Y-12 Plant	Tennessee	CWA	09/15/83
Oak Ridge Y-12 Plant	Tennessee	CWA	12/02/83
Hanford	Washington	RCRA	05/03/84
Oak Ridge Y-12 Plant	Tennessee	CAA	07/12/84
Lawrence Livermore National Laboratory (Main)	California	TSCA	09/11/84
Oak Ridge Y-12 Plant	Tennessee	RCRA	12/06/84
Oak Ridge Y-12 Plant	Tennessee	RCRA	12/06/84
Hanford	Washington	RCRA	12/26/84
Bonneville Power (Ross)	Washington	CWA	04/02/85
Portsmouth GDP	Ohio	CWA	04/11/85
Los Alamos National Lab	New Mexico	RCRA	05/07/85
Stanford Linear Accelerator Center	California (cleanup)	CWA	07/17/85
Sandia National Lab - Livermore	California (cleanup)	CWA	09/18/85**
Lawrence Livermore National Lab (Main)	California	RCRA	11/20/85
Hanford	Washington	CWA	01/23/86
Hanford	Washington/EPA	RCRA	02/05/86
Feed Materials Production Center	Ohio	CWA	06/26/87
Los Alamos National Lab	EPA	CWA	08/06/87
Lawrence Livermore National Lab (Site 300)	California	TSCA	09/25/87
Hanford	Washington	RCRA	10/30/87
Bonneville Power (Ross)	Washington	RCRA	01/04/88
Rocky Flats Plant	Colorado	RCRA	05/03/88
Sandia National Lab - Albuquerque	New Mexico	RCRA	05/11/88

* A unilateral environmental order is a directive issued by a Federal or State agency requiring actions (usually on a specified schedule) to correct violations of environmental permits or regulations. The terms of an unilateral order are not negotiated with the party receiving the order.

** Formally rescinded as a part of 09/21/88 order.

Lawrence Livermore National Lab	California	RCRA	06/15/88
Los Alamos National Lab	New Mexico	RCRA	08/30/88
Los Alamos National Lab	EPA	CWA	08/30/88
Sandia National Lab - Livermore	California (cleanup)	CWA	09/21/88
Portsmouth GDP	Ohio	RCRA	11/22/88
Lawrence Livermore National Lab (Site 300)	EPA	RCRA	03/08/89
Oak Ridge Y-12 Plant	Tennessee	RCRA	03/14/89
Oak Ridge National Lab	Tennessee	RCRA	03/14/89
Oak Ridge Gaseous Diffusion Plant	Tennessee	RCRA	03/14/89
Rocky Flats Plant	Colorado	RCRA	06/07/89
Oak Ridge Operations (Offsite Disposal)	Tennessee	CERCLA	01/08/90

APPENDIX D

ENFORCEMENT ACTIONS AGAINST DOE MANAGEMENT AND OPERATING (M&O) CONTRACTORS

Facility	M&O	Regulator	Action	Date
FMPC	NLO	EPA Region V	Complaint (TSCA)	03/12/85
SNLL	Sandia Corp.	State of CA	Site Cleanup Order	09/18/85
LANL	Univ. of CA	State of NM	Order (RCRA)	10/25/85
FMPC	NLO	State of OH	Lawsuit* (RCRA/CERCLA/CWA)	03/11/86
BNL	Assoc. Univ.	EPA Reg. II	Order (TSCA)	09/04/87
LLNL	Univ. of CA	EPA Region IX	Complaint (TSCA)	03/27/86
ETEC	Rockwell	EPA Region IX	Order (CAA)	06/11/86
RFP	Rockwell	EPA Region VIII	Complaint (TSCA)	06/30/86
FMPC	Westinghouse	State of OH	Lawsuit (CAA)	03/18/87
LLNL-Site 300	Univ. of CA	State of CA	Admin. Complaint* (RCRA)	09/25/87
RFP	Rockwell	State of CO	Compliance Order* (RCRA)	05/03/88
SNLA	AT&T	State of NM	Compliance Order* (RCRA)	05/11/88
RFP	Rockwell	EPA Region VIII	Complaint (TSCA)	06/27/88
LANL	Univ. of CA	State of NM	Compliance Order*(RCRA)	08/30/88
SNLL	Sandia Corp.	State of CA	Site Cleanup Order*	09/21/88
NTS	Reynolds	State of NV	Order (CWA)	12/02/88
FMPC	WMOO	EPA Region V	Order (RCRA)	02/09/89
LLNL-Site 300	Univ. of CA	EPA Region IX	Order* (RCRA)	03/08/89
Oak Ridge Y-12	Martin Marietta	State of TN	Order* (RCRA)	03/14/89
ORNL	Martin Marietta	State of TN	Order* (RCRA)	03/14/89
Oak Ridge GDP	Martin Marietta	State of TN	Order* (RCRA)	03/14/89
RFP	Rockwell	EPA Region VIII	Order* (RCRA)	06/07/89
RFP	Rockwell	EPA Region VIII	Order (RCRA)	09/19/89
Oak Ridge	Union Carbide (past operate)	State of TN	Order (TN CERCLA)	01/08/90

* Action also taken against DOE

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT COOPERATIVE AGREEMENTS

Site	Other Party	Statute	Effective Date
Monument Valley, AZ	Navajo Nation	P.L. 95-604	10/07/83
Tuba City, AZ	Navajo Nation/Hopi Tribe	P.L. 95-604	10/07/83
Durango, CO	Colorado Department of Health	P.L. 95-604	10/19/81
Grand Junction, CO	Colorado Department of Health	P.L. 95-604	10/19/81
Gunnison, CO	Colorado Department of Health	P.L. 95-604	10/19/81
Maybell, CO	Colorado Department of Health	P.L. 95-604	10/19/81
Naturita, CO	Colorado Department of Health	P.L. 95-604	10/19/81
Rifle, CO	Colorado Department of Health	P.L. 95-604	10/19/81
Slick Rock, CO	Colorado Department of Health	P.L. 95-604	10/19/81
Lowman, ID	Department of Health and Welfare	P.L. 95-604	03/11/85
Ambrosia Lake, NM	New Mexico Health and Environment Department	P.L. 95-604	09/27/85
Shiprock, NM	Navajo Nation	P.L. 95-604	10/07/83
Belfield, ND	State Department of Health	P.L. 95-604	02/23/83
Bowman, ND	State Department of Health	P.L. 95-604	02/23/83
Lakeview, OR	Oregon Department of Energy	P.L. 95-604	07/24/84
Canonsburg, PA	Department of Environmental Resources	P.L. 95-604	09/05/80
Edgemont, SD	Department of Water and Natural Resources	P.L. 95-604	05/22/84
Falls City, TX	Texas Department of Health	P.L. 95-604	03/31/86
Green River, UT	Division of Environmental Health	P.L. 95-604	03/30/83
Mexican Hat, UT	Navajo Nation	P.L. 95-604	10/07/83
Salt Lake City, UT	Division of Environmental Health	P.L. 95-604	03/30/83
Spook, WY	Department of Environmental Quality	P.L. 95-604	01/30/84
Riverton, WY	Department of Environmental Quality	P.L. 95-604	01/30/84

DOE INSTALLATIONS AND FACILITIES ON EPA NATIONAL PRIORITIES LIST*

Brookhaven National Laboratory (NY)
Feed Materials Production Center (OH)
Hanford Reservation (4 Sites) (WA)
Idaho National Engineering Laboratory (ID)
Lawrence Livermore National Laboratory (CA)
Monticello Uranium Mill Site (UT)
Monticello Vicinity Properties (UT)
Maywood Site (NJ)
Mound Plant (OH)
Oak Ridge Reservation (4 Sites) (TN)
Rocky Flats Plant (CO)
Savannah River Site (SC)
St. Louis Airport Site (MO)
W. R. Grace/Wayne Site (NJ)
Weldon Spring Quarry/Plants/Pits (MO)

* Only includes sites within scope of Five-Year Plan.

U.S. Department of Energy
Washington, D.C.

Secretary of Energy
NOTICE

SEN-11-89

SUBJECT: SETTING THE NEW DOE COURSE

DATE: 9-5-89

In my first notice to you on March 6, I said that after my first few months on the job, I would outline to you my thoughts on setting a "new course" for the Department to permit more efficient and effective mission execution. This notice sets that new "course." In this regard, I think it is important for you to have my thoughts so that, as subsequent initiatives are announced or new directives are issued, you will find a context within which they fit.

It is my strong conviction that if the Department is to accomplish its mission, we must move along the following new course lines, and move as quickly as possible. In the interest of simplicity, I am addressing only those areas of concern, vividly exposed to me in the early months, which I feel demand special corrective action. As a consequence, these initiatives are not intended to be all inclusive of every role and mission of the Department.

1. <u>Integrated Planning and Policy</u>. We will develop an integrated National Energy Strategy for the President that places energy, health, safety, environment, technology, and economy into a mutually supportive framework. The President, the Congress, and the American public should be able to see where we are going and why -- near term, mid-term, and for the long haul. Our plan is to have a skeletal structure of the National Energy Strategy in place by late this summer; to complete about December 1989 the series of public hearings now underway in order to obtain a broad range of inputs from all interested parties; to collate their inputs and produce and publish a first draft of the Strategy by April 1, 1990; to allow six months for public comment; and to present in final draft form to the President by December 1990 our best recommendations for his eventual adoption as the National Energy Strategy. This will be a difficult coordinating task for our newly-strengthened Policy Office. But I expect all of you to support that Office, and most importantly, to contribute your own talents and time to the developmental effort as well.

2. <u>Accountability for Environment, Safety, Health, Security, and Efficient Operations</u>. Preserving our environment, protecting public health and safety, and assuring the Nation's security are primary DOE responsibilities. It is true that the very large majority of our work in the field is actually carried out by contractors,

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including our national laboratories. But this fact in no way relieves DOE managers of their governmental responsibilities to ensure that contractors' primary duties are performed in accordance with expected high standards of professional excellence. While current periodic external oversight is useful, it is not sufficient to carry out day-to-day, shift-by-shift internal line management oversight responsibilities at many of our field activities. In this connection, senior DOE field and headquarters officials will be expected to ensure that their contractors comply with operational, environmental, safety, health and security standards established by law, regulation or Departmental policy, while at the same time ensuring that they meet their production or research mission. We need the contractors to help us complete our missions, and I intend to meet personally with all the major contractors in the next six months to ensure that they know the course that we are setting.

To do this, DOE line managers need sufficient numbers of skilled Federal employees to support them. Accordingly, I intend to establish permanent positions and put into place DOE people with the capabilities necessary to support line managers in the execution of their oversight responsibilities in both field and headquarters positions. This is a necessary precursor to line managers' acceptance of full responsibility, and accountability for efficient and effective execution of vital DOE mission tasks. When in place, primary accountability and responsibility will have been clearly fixed in the DOE line management at all levels. Additionally, line management performance in executing their fundamentally oversight role will continue to be subject to both independent internal (DOE) and external (non-DOE) oversight as required by law or regulation.

3. Safe Restart of Defense Production Reactors. We will restart the defense production reactors only after safety of their operations can be assured, and only after health and environmental requirements have been addressed. These vital elements to safe start-up will be validated by both internal and external independent oversight entities established by law or regulation.

4. Management Reform. We will effect significant management reform throughout Department headquarters and field activities. This will include measures to effect both program reform and badly-needed cultural change. The new culture will emphasize an open door philosophy and demand professional excellence in both government and contractor performance, a culture wherein constructive criticism from any source, external as well as internal, is encouraged and rewarded. Specific initiatives underway, not necessarily in priority order, include:

A. Waste Management. Establish a definitive, priority-driven, well-costed, five-year waste management plan for DOE wastes, coupled closely to the latest available technologies in order to minimize cost and maximize efficiency in achieving five-year objectives. We will then expand this to a longer term, research-linked technology plan which will be made subject to independent external review. Both five-year and longer term plans will be updated annually.

B. Defense Facility Modernization Program. Establish an integrated near-term (0-5 years) and long-term (5-20 years), priority-driven, well-costed defense program facility modernization plan. This five-year plan, when developed, will be updated annually. The five-year modernization plan will provide the mechanism for near-term action while retaining relevance to long-term modernization objectives. This program is badly needed to restore our physical plant capabilities and to achieve a more efficient and fiscally-responsible execution of the defense portion of the DOE mission over the long haul. The long-term plan will also be updated annually as required by technological changes, shifts in priority, and fiscal realities. The DOE complex will have to be modernized with environmental considerations and waste minimization as integral parts of future plant designs and management practices to avoid another cycle of unnecessarily costly cleanup and to ensure that DOE facilities are ready to comply with what can be anticipated as surely stricter environmental standards for tomorrow.

C. Non-Defense Facility Modernization Programs. Similar to the program listed above for defense facilities, initiate a modernization program for non-defense facilities as well.

D. Planning, Program and Budget. Establish a coordinated planning, programming and budget capability that can integrate horizontally across the entire range of DOE programs in order to bring plans and programs into line with near (1-5 years), mid (5-10 years), and long-term (15-20 years or longer) objectives of the National Energy Strategy.

E. Contract Management. Modify and significantly strengthen existing contracting strategies, particularly in the area of 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 assure that DOE line managers have the tools to ensure corrective action will be forthcoming when contractors do not perform to standards.

F. Independent Internal Oversight. Strengthen independent internal oversight responsibilities within Environment, Safety and Health (EH), Nuclear Energy (NE), and other designated offices (e.g., DP) as required to monitor effectiveness of DOE management in execution of policies set by DOE, particularly in areas of environment, safety, health and security. These internal DOE oversight functions are in addition to any external oversight bodies established by law or regulation.

G. Independent External Oversight. Work constructively with external oversight bodies to build a system that will provide proper external checks of the Department's line and oversight management practices. The existing independent Advisory Committee on Nuclear Facility Safety and the new Defense Nuclear Facilities Safety Board, when installed, will perform much of the required external oversight functions.

H. Education and Training Programs. Establish new education and development programs for Departmental staff, managers, and executives to ensure that personnel at all levels and in all organizations of the Department, both at headquarters and in the field, are fully prepared to carry out tasks expected of them, particularly as they assume new and higher levels of management responsibility. In this connection, I intend to revitalize the intern program to attract high-caliber young professionals into the Department.

I. Epidemiology and Radiological Health. Initiate a 4-point program to ensure DOE's epidemiologic research activities are appropriate, effective, and represent excellence. The program will include an expert external panel to evaluate DOE's current epidemiologic activities; an independent scientific committee to advise DOE on an ongoing basis; a data repository for all epidemiologically relevant information on past and present DOE workers; and a mechanism to share DOE's information with qualified researchers. This program will be the first step in establishing DOE's epidemiology research program as the global model for the epidemiologic study of the energy industry. In addition, considerable emphasis will be placed on radiological health aspects of all our nuclear facility operations.

5. Human Potential. We must expand our involvement in science education to inspire the youth of America to either enter or feel more comfortable in the fields of math, science, and engineering. With our labs and facilities, we are uniquely well-positioned to provide major assistance in strengthening science and engineering motivation and education, making it "come alive" for the main body of students who too often fear these disciplines or who cannot relate to them. I intend to lead this effort personally.

6. Technological Competitiveness and Technology Transfer. The development and deployment of new technologies from the DOE laboratories can do much to enhance U.S. competitiveness. Too many times in the past we have developed promising new technologies only to see our foreign competitors get the benefit of successfully introducing these technologies into the private sector. This must change. DOE labs will be tasked to place new emphasis on technology transfer. All DOE research and development programs will be placed in a continuum of sequential actions extending from basic research, to applied research, to developmental research, and finally to transfer of technology to the private sector. The role of working cooperatively with industry throughout this continuum including cost-sharing, will be highlighted to determine: technology transfer potential; the timing to commence the transfer-to-the-private-sector process; and mechanisms of fixing the cost burdens in a fair and equitable fashion.

7. Incident Reports Management (includes UORs). The current incident reporting system needs major overhaul. In a variety of environment, health, safety and security-related situations witnessed to date, reports available to top DOE management simply do not reflect actual situations which prevail in the field. As a consequence, neither preventive nor corrective actions are instituted in a timely fashion. Crisis management, after the fact, has become the norm too often. An entirely new system of reporting, analysis, and follow-up will be instituted to help minimize unwarranted surprises and maximize operational effectiveness.

8. Emergency Planning and Response. With responsibility for managing activities at more than 40 important nuclear and non-nuclear facilities around the nation, the Department is obliged to ensure that each site is prepared for all contingencies. Therefore, I expect each field office and contractor to develop and test up-to-date, integrated emergency plans which utilize the most effective technology. Energy incidents caused by human errors or outside events cannot be eliminated, but their damage to human health, the environment and the economy can be limited by effective contingency planning and frequent exercise of these plans.

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9-5-89

9. Accountability for nuclear safety in weapon design and stockpile surveillance. The importance of safety in nuclear weapon design and during stockpile life of deployed weapons cannot be overstated. The Department of Energy must continue to exercise vigilance in its responsibilities for nuclear weapon safety. Together, the Departments of Energy and Defense share responsibility for nuclear weapon safety from design through deployment and ultimately to retirement. It is the proper moral and statutory obligation of the Department of Energy to be an advocate for safety and use control considerations with respect to nuclear weapons, just as military characteristics are the proper domain of the Department of Defense. Senior DOE officials in Defense Programs must ensure that new nuclear weapons, as well as those in current stockpile, incorporate modern safety and control features. New institutional process changes will be made to effect this initiative.

If these initiatives receive your support, we will effect a positive cultural change within DOE, but more importantly, will create a new credibility throughout the country about the way DOE serves the Nation.

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

REMARKS BY
JAMES D. WATKINS
SECRETARY OF ENERGY
JUNE 27, 1989

When the President asked me to take this job in January, he indicated that the problems faced by the Department of Energy (DOE) were very serious in nature. The underlying operating philosophy and culture of DOE was that adequate production of defense nuclear materials and a healthy, safe environment were not compatible objectives. I strongly disagree with this thinking.

I agreed to serve as Secretary of Energy knowing full well that one of my immediate tasks would be to create a new culture of accountability within the Department. Today, I am announcing a 10-point initiative that will chart a new course for the Department toward full accountability in the areas of environment, safety, and health. These measures are essential to demonstrate that DOE is committed to complying with the Nation's environmental laws and is capable of discharging its many responsibilities which include protecting public health and safety.

I have undertaken these extraordinary steps to help restore public credibility in the Department's ability to safely operate its unique defense, research, and test facilities. Because of the serious nature of the many management problems facing me at DOE, I have found that I must undertake my own assessment of all DOE operations in order to come up with an adequate baseline of information, one upon which I can then make informed judgments. The steps I announce today are also intended to help find a new way of successfully integrating the Department's national security mission with its environmental restoration and compliance activities.

For over four decades, DOE and its contractors have accepted these two objectives as being mutually-exclusive. Virtually all incentives and awards have been coupled to production, much more so than all other considerations combined. So, now, the chickens have finally come home to roost and years of inattention to changing standards and demands regarding the environment, safety, and health are vividly exposed to public examination, almost daily. I am certainly not proud or pleased with what I have seen over my first few months in office. As a result, I must continue to implement measures that can lead the Department to a new culture which takes pride in being good stewards of public lands, while demonstrating that our primary production mission can be achieved concurrently.

Since undertaking my present assignment as Secretary of Energy only four short months ago, I have also been surprised to learn that the Department relies on insufficient scientific information in making its decisions and in developing public policy. In this regard, I am instituting measures that will greatly increase the roles State agencies, the Environmental Protection Agency (EPA), the National Academy of Sciences (NAS), and even our own National Laboratories, play in DOE decision-making to provide a greater influence on the quality of the scientific data we employ to make our decisions affecting public health, safety, and the environment.

To move DOE more aggressively toward the highly professional, technically competent, and credible Federal agency that the President, the Congress, and the American public expect, I am placing into effect immediately a special ten-point initiative.

This 10-point initiative includes:

- Resetting of priorities to reflect environment, safety, and health as more heavily weighted than production. As a result, we are beginning negotiations with those States hosting DOE nuclear facilities to allow direct access and enhance State monitoring capabilities;
- modifying the criteria for awarding contractor fees to reflect increased emphasis of environment, safety, and health;
- establishing independent "tiger teams" to conduct environmental compliance assessments;
- improving the way in which DOE complies with the National Environmental Policy Act (NEPA) documentation and by coordinating its activities with the Governors of the States which host DOE facilities;
- establishing an entirely new management team within the Department's Office of Defense Programs, under the leadership of Victor Stello, Jr., currently the Executive

Director of Operations at the Nuclear Regulatory Commission to again emphasize safety over production;

- strengthening the environment, safety, and health technical capabilities of line managers within the DOE organizational structure;

- appointing an independent panel to help restructure the Department's epidemiology program, including the creation of a new standing committee by the National Academy of Sciences to oversee epidemiologic research requests;

- establishing a comprehensive epidemiological data repository containing information on past and present DOE workers that may be used by any qualified researcher;

- requiring that milestones to achieve full compliance with Occupational Safety and Health Administration (OSHA) standards must be included in the Defense Facilities Modernization Five-Year Plan now under development; and,

- accelerating the cleanup of DOE facilities through the allocation of an additional $300 million for FY 1990 activities consistent with the Environmental Restoration and Waste Management Five-Year Plan.

Deputy Secretary Henson Moore introduced the first of these initiatives on June 16, 1989, when he announced that environment, safety, and health objectives now take precedence over production objectives. This served as the basis for a comprehensive agreement between the Department of Energy and the State of Colorado regarding environmental compliance at the Rocky Flats Plant near Denver. That agreement is unprecedented in scope and in the degree of cooperation that it portends between DOE and the State. It will be a model for new DOE cooperation with the States.

I reiterate that initiative today and am directing that DOE begin negotiations on similar agreements with other States which host our many facilities. This model agreement will help the Governor of a State assure its citizens that past and current practices will not constitute a health hazard. This new concept will provide for independent validation of environmental data, for environmental restoration cleanup schedules, and for assisting in establishing priorities so necessary to meet agreed-to timetables.

My second initiative concerns a new direction for the Department's award fee program. This initiative has two parts.

First, I am modifying the criteria for award fees to our defense production contractors so that not less than 51 percent of the available award will be based on compliance with environmental, safety, and health requirements, including requirements that derive from State environmental laws, regulations of the Environmental Protection Agency and the DOE, and actions set forth in tri-party Federal facility compliance agreements. A much smaller percentage is now the norm such as the 20 percent figure in the Rocky Flats contract.

Second, I am directing that a provision be included in Departmental contracts stipulating that <u>all</u> of the potential award fee that may be earned will be at risk if a contractor fails in any of these three or other important award fee categories.

The third initiative I am announcing today is the formation of environmental "tiger teams," similar to the 25-person DOE investigative team that I sent to Rocky Flats. This includes reviewing operations, documentation, agreements, planning, and the facility's performance in meeting environmentally-regulated schedules. Two such teams will visit two DOE facilities within the next two weeks to conduct environmental compliance assessments. They will follow the environmental assessment protocol presently being performed at Rocky Flats. Six additional facilities will be visited within the next 6 months, and then 10 more facilities will be assessed in the following 6 months, for a total of 18 in the next year. I intend to have environmental teams visit the remaining 17 major DOE facilities (total 35) one year later. All other environmentally less-demanding facilities (totalling about 100 more) will be scheduled to complete compliance assessments by December 1992. To assist these teams in their work, I have asked for a special hotline to be established within DOE Headquarters to allow citizens to report specific facility concerns.

My fourth initiative addresses Departmental compliance with NEPA. I am directing that the Department revise its procedures and establish a uniform policy on a site-by-site basis for implementing NEPA so that preliminary NEPA decisions involve the Secretary of Energy from the outset and are fully coordinated with the Governors of the States that host our facilities. The non-uniform, haphazard, overly-decentralized, and self-defeating process previously institutionalized has been terminated. In the future, if the Department is to err in its judgment as to extent of NEPA review required of new projects, it will err on the side of full disclosure and complete assessment of potential environmental impacts.

My fifth initiative is one of the most important. I am establishing an entirely new management team under a new Assistant Secretary for Defense Programs. To head that office, the President has indicated his intent to nominate a strong, technically competent federal manager, Mr. Victor Stello, Jr., who currently serves as Executive Director of Operations at the Nuclear Regulatory Commission (NRC). Vic has a wealth of experience from the regulatory side, notably in assuring that nuclear safety takes precedence over production. Mr. Stello, and the new team he will assemble, will bring responsibility and accountability to line management of the Department's defense nuclear facilities. Mr. Stello will assure that conformance to environmental laws and attention to these requirements are developed through a safety-conscious culture that will assure production objectives are met without violation of environmental, safety, or health standards to which all interested parties have agreed. Mr. Stello led the NRC in preparing its first Environmental Impact Statement requirements and will bring this type of direction to the Office of Defense Programs. This is the first time we have selected an individual who has safety and environmental training and understands that production is a mutually compatible objective with environment, safety and health.

Strengthening the technical capability of line management in the environment, safety and health areas, such as we did by establishing a brand new support group at Rocky Flats, is my sixth initiative. It is a well-known fact that the very large majority of our work in the field is actually carried out by private contractors. This fact in no way relieves DOE field managers of their own responsibility and accountability to ensure that contract execution meets expected performance standards of excellence. On my watch, senior DOE officials will also be expected to ensure that their contractors comply with operational, environmental, safety, health and security standards established by law or regulation. But to do this, DOE officials need sufficient numbers of appropriately skilled DOE line supervisors to support them. This support is not there today.

Accordingly, I intend to establish permanent positions and put into place DOE people with the requisite skills to support line managers in both field and headquarters positions. This is the necessary precursor to DOE line managers acceptance of full responsibility and accountability for these vital functions. When in place, primary accountability and responsibility will have been clearly fixed in the DOE line management at all levels. Additionally, line management performance will continue to be subject to both independent internal (DOE) and independent external (non-DOE) oversight as required by law or regulation.

My seventh and eighth initiatives concern the Department's epidemiological data on DOE and contractor employees.

The seventh initiative that I am announcing today is the appointment of an independent panel of professional experts in public health, occupational health and epidemiology to advise me as I restructure the DOE epidemiology program. This panel will conduct a detailed evaluation of the entire range of DOE's epidemiologic activities. They will be charged with examining such areas as the goals and objectives of the epidemiology program; the budget and full-time equivalent resources allocated to epidemiologic research; program management and reporting structure; as well as other areas that are germane to the proper operation of our epidemiologic research program. I am ready to provide the resources necessary to do the job better, but I want outside experts to help me structure the program properly.

I have also asked the National Academy of Sciences (NAS) to establish a standing "Committee on Radiation Epidemiologic Research Programs." The purpose of this committee is to provide ongoing, independent scientific counsel to the Department of Energy regarding its epidemiologic research activities, including the creation of a comprehensive epidemiologic data repository. This committee will assure that DOE receives objective scientific advice on its epidemiological programs on a continuous basis.

My eighth initiative is the establishment of a Comprehensive Epidemiologic Data Repository (CEDR) for all epidemiologically relevant information on past and present DOE and contract workers. The data will be located in a single place and stored in a format that can be easily used by any qualified researcher. Such a repository will enable scientists who are not affiliated with DOE to have access to the DOE worker data so they can conduct independent epidemiologic studies on the DOE worker population. My general view is that approximately $36 million over a 6-year period will be required to run a program of this magnitude, but I will use the work of the two groups to help me establish the details needed to implement this initiative.

Today, researchers unaffiliated with the Department cannot gain access to epidemiologic data on DOE workers. Realizing that the establishment of such a repository could take several years to complete, I have asked the National Academy of Sciences to advise the Department on appropriate criteria for allowing independent researchers near-term access to raw DOE worker data. The system we will establish based on NAS's recommendations will assure that DOE data is utilized to conduct studies that are both accurate and complete.

My ninth initiative involves worker safety. Full compliance with OSHA standards will be a central element of the five-year defense facilities modernization plan currently in preparation. Although DOE has adopted OSHA standards along with other national safety and health standards as a matter of stated policy, it is my intention to ensure that we are in <u>compliance</u> with OSHA standards in execution of policy.

In this regard, I will be formally requesting that OSHA participate with DOE in a series of inspections of DOE's defense production facilities. I believe that the Department's safety and health programs could be improved with involvement in facility inspections by resolving health- and safety-related complaints by employees and labor unions, and conducting investigations of serious industrial accidents and incidents. These joint inspections will be structured to assure that the Department's mission can be accomplished while preserving the health and safety of employees and avoiding loss of government property. Additionally, I have asked the Under Secretary to prepare a similar plan to phase in OSHA compliance at our non-defense facilities.

My tenth initiative is the first action taken as a result of the Environmental Restoration and Waste Management Five-Year Plan which I announced in March of this year. The Administration, working with Congress, has provided an additional $300 million in the FY 1990 budget to accelerate the clean-up of our facilities over and above the previous Administration's funding request. The original FY 1990 budget was $1.8 billion. President Bush increased this to $2.1 billion. In recognition of the need for acceleration, an additional $300 million will be added. This increase will raise the present FY 1990 budget for the Department's environmental restoration and waste management activities from approximately $2.1 billion to $2.4 billion. This funding will continue to increase in future years and as is currently estimated in our 5-year planning efforts at approximately $4.0 billion in FY 1993; $4.1 billion in FY 1994; and $4.1 billion in FY 1995. However, I must restate that these figures are only preliminary estimates and will be refined as we progress in our planning efforts and as we define the impacts of our much more focused and aggressive research and development initiatives on cleanup planning.

Based on the very flaw in DOE that led me to my earlier observation that I must undertake my own assessment of all DOE operations in order to come up with an adequate baseline of information, one upon which I can then make informed judgments, I will not be driven by any previously set schedules or management decisions which still do not answer emerging questions as to the soundness of technical data or completeness of reviews. WIPP is a classic example of the crying need to re-establish a well-aired and documented baseline of understanding.

In this connection, for example, DOE will form a blue-ribbon panel of recognized experts from industry, academia and government to review current plans for demonstrating WIPP's technical and operational adequacy. The National Academy of Sciences has also been asked to advise DOE on the adequacy of the geotechnical test program to assure the program meets environmental standards. Both panels will independently evaluate the operational performance of the facility. I can assure you that I will not compromise the environment through blind allegiance to past decisions that may have been made without adequate consideration of technical, scientific, economic and social issues. WIPP will only open when I deem it safe and other key non-DOE reviewers are satisfied.

The goal of the 10 initiatives that I have announced today is to restore credibility to the Department of Energy, and to provide the kind of environmentally-responsible direction that is critical to achieving the important national missions of the Department of Energy.

- o The authority and responsibilities for implementing environment, safety and health requirements are not well defined or understood.

- o Management systems, both in Headquarters' program offices and in the field, lack sufficient formality and discipline to implement effective ES&H programs.

- o Major difficulties exist in obtaining sufficient numbers of staff with appropriate qualifications to carry out program activities in a manner which will ensure full compliance with ES&H requirements. Compounding the problem are difficulties associated with recruiting highly skilled and experienced professionals and obtaining security clearances in a timely manner.

- o OSHA review of Y-12, Mound and Pantex identified relatively large numbers of non-compliances, including construction activities, machine guarding, electrical safety, use of toxic substances and walking/working surfaces.

In addition, key deficiencies in each of the following technical areas/programs were identified:

- o Radiological Protection - system design and procedures for control of radioactive contamination;

- o Emergency Preparedness - procedures and public involvement;

- o Waste Management - waste characterization and waste storage, treatment and disposal;

- o Inactive Waste Sites - planning and oversight/quality assurance; and

- o Environmental Monitoring - sampling and laboratory quality assurance programs and practices.

In response to the results of the analysis, Admiral Watkins has directed DOE to take the following actions to address these issues:

- o Management systems and controls should be reviewed and revised to include accountability, monitoring, feedback reporting and oversight of performance to ensure implementation of ES&H requirements and objectives. The discipline and formality of management systems must be improved.

(MORE)

DOE NEWS

NEWS MEDIA CONTACT:
Catherine Kaliniak, 202/586-5806

FOR IMMEDIATE RELEASE
February 5, 1990

DOE RELEASES PRELIMINARY REVIEW OF TRENDS IN TIGER TEAM ASSESSMENTS

Secretary of Energy James D. Watkins announced today the results of a preliminary analysis of the first "Tiger Team" assessments. These assessments include the Rocky Flats Plant in Colorado, Feed Materials Production Center in Ohio, West Valley Demonstration Project in New York, Y-12 Plant in Tennessee, Pantex Plant in Texas and Mound Plant in Ohio.

The Tiger Team Assessment Program is conducted by the Office of the Assistant Secretary for Environment, Safety and Health (EH) as a part of that office's newly strengthened role to provide the Secretary with independent oversight of departmental performance and compliance. Under recent organizational realignments that have been made by Admiral Watkins, the Assistant Secretary's responsibility is to evaluate Department of Energy's (DOE) ES&H programs and advise the Secretary, independent of line management, of their effectiveness, compliance with federal, state and local regulations and internal DOE requirements, and opportunities for achieving operational excellence. The Assistant Secretary will manage Tiger Team Assessments at DOE's major operating facilities over the next three years, utilizing the best of the department's technical resources.

"I am providing the results of the preliminary analysis to all departmental elements for evaluation and application within appropriate line organizations," said Admiral Watkins. "The Tiger Team assessments are one of my ten initiatives to strengthen the department's environment, safety and health (ES&H) protection and waste management activities and ensure that all DOE facilities achieve and maintain full compliance with federal and state requirements."

The preliminary analysis of the results of the assessments indicates trends which may prove endemic to DOE facilities. There are several high priority issues which Admiral Watkins has directed DOE to pay particular attention to as it performs internal review of the facilities and develops programs to address ES&H concerns.

(MORE)

R-90-027

- o The objective of Admiral Watkins' 10-Point Initiative and his policy of full compliance with environmental, safety and health requirements must continue to be emphasized and reinforced. The Admiral's policy of compliance must be implemented through the chain of command within DOE and its contractors. A consistent set of performance expectations and technical requirements must be communicated throughout the entire system.

- o Staff resource requirements must be identified and prioritized, followed by an expedited process for bringing new people on board (including security processing).

- o The department's training programs require expansion and improvement to ensure understanding, communication and implementation of ES&H requirements such as RCRA and OSHA.

- o Immediate attention needs to be focused on workplace safety and health. Admiral Watkins is committed to ensuring that DOE facilities meet standards comparable to those set by OSHA.

"In accordance with my efforts to set a new DOE course of accountability and excellence in the areas of environment, safety and health," said Admiral Watkins, "all line organizations have been directed to implement a comprehensive self-assessment program to identify and characterize ES&H concerns relating to their operations. The information from this program will be key to accomplishing my goal of establishing definitive, priority-driven, well-costed management plans. Future Tiger Teams will review the results of the facilities self-assessment programs to evaluate the site's understanding and management of ES&H issues."

Efforts in the area of self-assessment, along with continued independent oversight of the line organizations by the Office of the Assistant Secretary for Environment, Safety and Health, are critical components of the Admiral's plans for correcting ES&H problems within the department and were initiated in conjunction with the issuance of a Secretarial directive dated May 19, 1989.

-DOE-

R-90-027

DOE F 1325.8 (10-88) APPENDIX F3

United States Government **Department of Energy**

memorandum

DATE: January 26, 1990

REPLY TO ATTN OF: S-1

SUBJECT: PRELIMINARY REVIEW OF TRENDS IN TIGER TEAM ASSESSMENTS

TO: Secretarial Officers
Managers, Operations Offices
Administrators, Power Marketing Administrators

In accordance with my efforts to set a new DOE course of accountability and excellence in the areas of Environment, Safety, and Health (ES&H) as outlined in my Secretary of Energy Notices, I am directing that all line organizations implement a comprehensive self-assessment program to identify and characterize ES&H concerns relating to their operations. The information from this program is key to the accomplishment of my goal of establishing definitive, priority-driven, well-costed, management plans. I have asked that future Tiger Teams review the results of the facilities self-assessment programs while on-site to evaluate the site's understanding and management of ES&H issues.

The Assistant Secretary for Environment, Safety, and Health has performed an analysis of the first six assessments completed by the Tiger Teams. The assessments included the Rocky Flats Plant, Feed Materials Production Center, West Valley Demonstration Project, Y-12 Plant, Pantex Facility and Mound Plant. I am providing the results of the analysis to all Departmental elements for evaluation and appropriate application within line organizations.

This preliminary analysis indicates trends which may prove to be endemic to the Department's facilities. The analysis provides a synopsis of the key findings for all the assessments, a statistical summary of the findings by frequency of occurrence, and a listing of all findings for the assessments.

There are several high priority issues which need to be addressed. Pay particular attention to the following concerns as you develop programs to address these issues and as you continue to perform self-assessments of your programs and facilities.

<u>MANAGEMENT AND OVERSIGHT OF ES&H ACTIVITIES:</u> ES&H authority and responsibilities are not well defined or understood. Facilities tend to operate in a reactive mode and have either not implemented, or are slow to implement, comprehensive management systems to ensure compliance with ES&H requirements. The facilities are lacking adequate self-assessment programs to ensure that ES&H deficiencies are identified, reported, and corrected. In addition, Operations Offices and the Area Offices provide insufficient oversight of contractor activities.

Management systems and controls should be reviewed and revised if necessary to include accountability, monitoring, feedback reporting, and oversight of performance to ensure implementation of ES&H requirements and objectives.

<u>CONDUCT OF OPERATIONS/FORMALITY AND DISCIPLINE:</u> Management systems lack sufficient formality and discipline to implement effective ES&H programs. Situations which are inconsistent with requirements in DOE Orders (letter and/or intent) have been identified and yet allowed to continue. A prime example is the widespread lack of comprehensive Safety Analysis Reports for many moderate and high risk facilities. Other observations include: inconsistent application of quality assurance/quality control, lack of comprehensive follow-up, lack of trend analysis, and lack of adequate documentation (i.e. NEPA, RCRA/CERCLA, etc.).

We must demonstrate that we are able to discipline ourselves and our contractors. Our inability to conform to <u>our own</u> requirements is particularly disturbing given the many areas of compliance that we are required to address. Simply stated, the discipline and formality of our management systems must be improved.

<u>COMMUNICATION OF ES&H POLICY:</u> Although there is evidence of improvement, we have not succeeded in communicating ES&H policy to all levels of DOE and contractor staff. ES&H directives and guidance which communicate these policies are often unclear and do not contain needed supplementary guidance. Cost-plus-award-fee plans and contract structures need improvement to be effective as management and incentive tools. We need to make sure that a consistent set of performance expectations and technical requirements are being communicated throughout the entire system.

The results show that the message of my ten point plan and the emphasis on compliance with environmental, safety and health requirements must continue to be emphasized and reinforced. Steps to eliminate the "business as usual" approach to compliance are still required in the Departmental infrastructure. It is essential that my policy of compliance be implemented through the chain of command within the agency and its contractors by effective use of orders, guidance, employee performance objectives, and contractor performance evaluations.

<u>RESOURCES/TRAINING:</u> Major difficulties exist in obtaining sufficient numbers of staff with appropriate qualifications to carry out program activities in a manner which will ensure full compliance with ES&H requirements. Compounding the problem are difficulties associated with recruiting highly skilled and experienced professionals and obtaining security clearances in a timely manner.

Staff resource requirements need to be identified and documented. We also need to find ways to speed up the process of bringing new people on board (including security processing). In addition, the Department's training programs require expansion and improvement to ensure understanding, communication, and implementation of ES&H requirements such as RCRA and OSHA.

OCCUPATIONAL SAFETY AND HEALTH: OSHA review of the workplaces at Y-12, Mound and Pantex identified relatively large numbers of non-compliances. The more important areas of non-compliance include; construction activities, machine guarding, electrical safety, use of toxic substances, and walking/working surfaces. These areas generally reflect relatively high risks of injury or death to small numbers of workers.

Immediate attention needs to be focused on workplace safety and health. It is my intention to ensure that our facilities meet standards comparable to those set by OSHA.

TECHNICAL ISSUES: Key deficiencies in each of the following technical areas/programs were identified:

- o Radiological Protection - system design and procedures for control of radioactive contamination;
- o Emergency Preparedness - procedures and public involvement;
- o Waste Management - waste characterization and waste storage, treatment, and disposal ;
- o Inactive Waste Sites - planning and oversight/quality assurance; and
- o Environmental Monitoring - sampling and laboratory quality assurance programs and practices.

Focus on these key deficiencies and the findings listed in the attached materials as you develop and implement your self-assessment program. The information from this program will be key to the establishment of a proactive management system which embodies my environment, safety, and health goals and objectives.

Any questions you might have on the attached material should be directed to the Office of the Assistant Secretary for Environment, Safety, and Health.

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

Attachments:

PRELIMINARY TREND ANALYSIS
DOE TIGER TEAM ASSESSMENTS

MANAGEMENT TEAM - ORGANIZATION AND ADMINISTRATION

The organization and administration area of the Management and Organization Assessment deals with lines of authority, authority for accomplishing ES&H activities, and the establishment of resource priorities. In addition, formality of operations, corporate support, management systems for ES&H authorizations, and the inclusion of ES&H goals, objectives, and requirements in the Management and Operating Contract were included in this assessment area.

Findings in the organization and administration assessment area generally fall into four (4) groups.

1 Implementation of ES&H Management Systems: 67% of the facilities assessed to date have not implemented or are slow to implement management systems for ES&H program activities to assure compliance with all requirements. Findings supporting this initial trend are:

FMPC M-9
Pantex M/CF-1
Pantex M/BMPF-2
WVDP A-1
RFP 3.2-10

2 Authority and Responsibility: 50% of the facilities assessed to date have shown that ES&H authorities and responsibilities are not adequately known. Findings supporting this initial trend are:

Pantex M/BMPF-5
Y-12 6.5.6
RFP 3.1-2
RFP 3.2-11

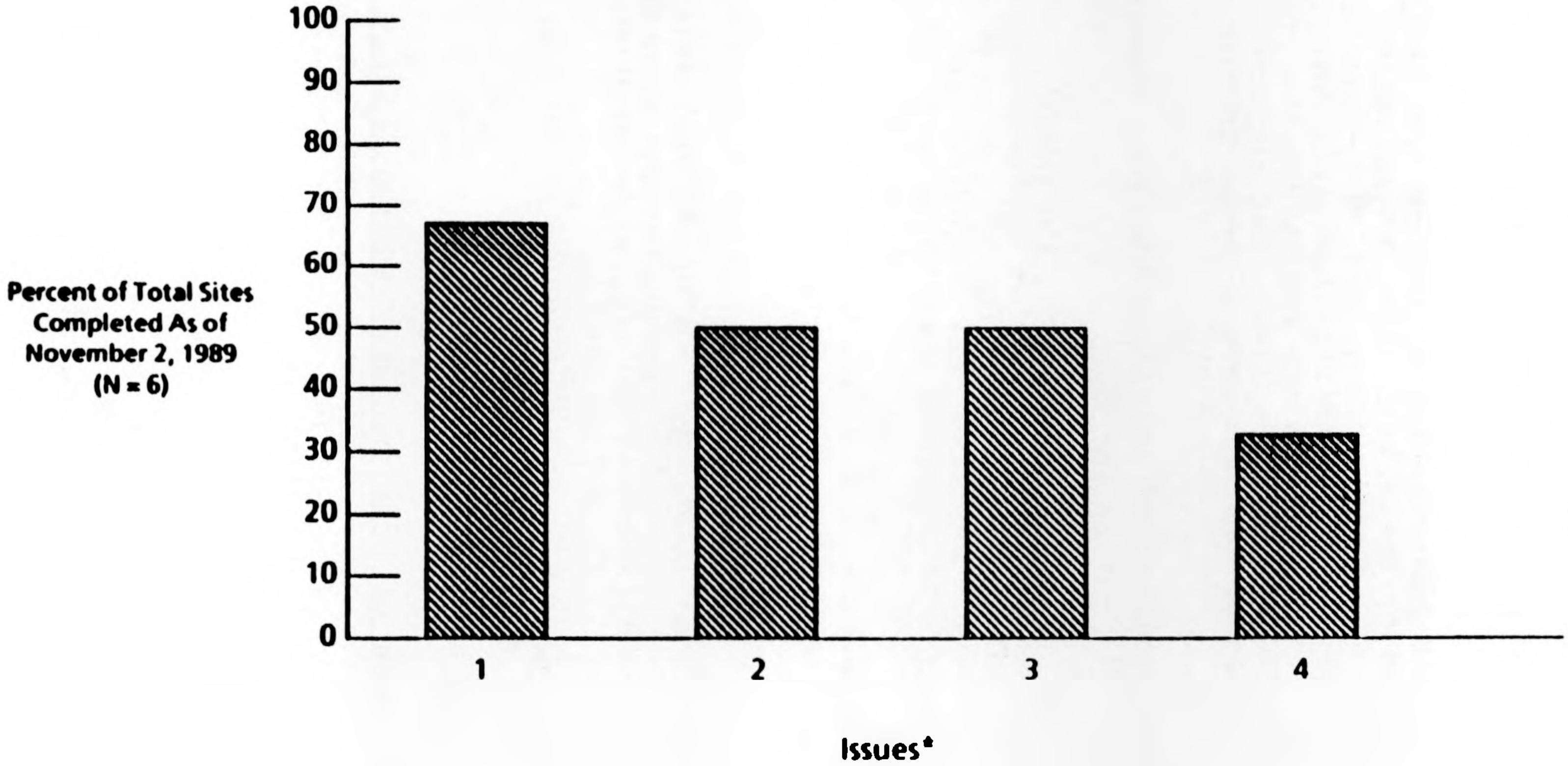
3 Depth and Scope of ES&H Program: 50 % of the facilities assessed to date have shown that the ES&H program is not adequate. Findings supporting this initial trend are:

WVDP A-2
Y-12 6.5.11
RFP 3.3-4

4 Reactive Management - 33% of the sites assessed to date have shown that management tends to operate in a reactive versus proactive manner for ES&H activities. Findings supporting this initial trend are:

Pantex M/BMPF-3 RFP 3.3-1

Management Team - Organization and Administration



*Legend for Compliance Issues
1 Implementation of ES&H Management Systems
2 Authority and Responsibility
3 Depth and Scope of ES&H Program
4 Reactive Management

PRELIMINARY TREND ANALYSIS
DOE TIGER TEAM ASSESSMENTS

MANAGEMENT TEAM - COMMUNICATION OF ES&H OBJECTIVES

The communication of ES&H objectives area of the Management and Organization Assessment deals with internal and external systems to communicate ES&H objectives, worker understanding and acceptance of those objectives, and the level of accountability for ES&H activities. In addition, the manner in which these objectives were communicated to workers was included. For example, do worker performance standards include ES&H objectives, or are there incentive programs which foster ES&H excellence in place?

Findings in the communication of ES&H objectives assessment area generally fall into three (3) groups.

1 Communication of ES&H Policy and Objectives: 67% of the facilities assessed to date have shown that there are problems communicating ES&H policy and objectives to all levels of the organization. This ineffective communication has resulted in a lack of or slowness of culture change. Findings supporting this initial trend are:

WVDP B-1
Pantex M/BMPF-6
Mound DO/BMPF-1
RFP 3.1-4

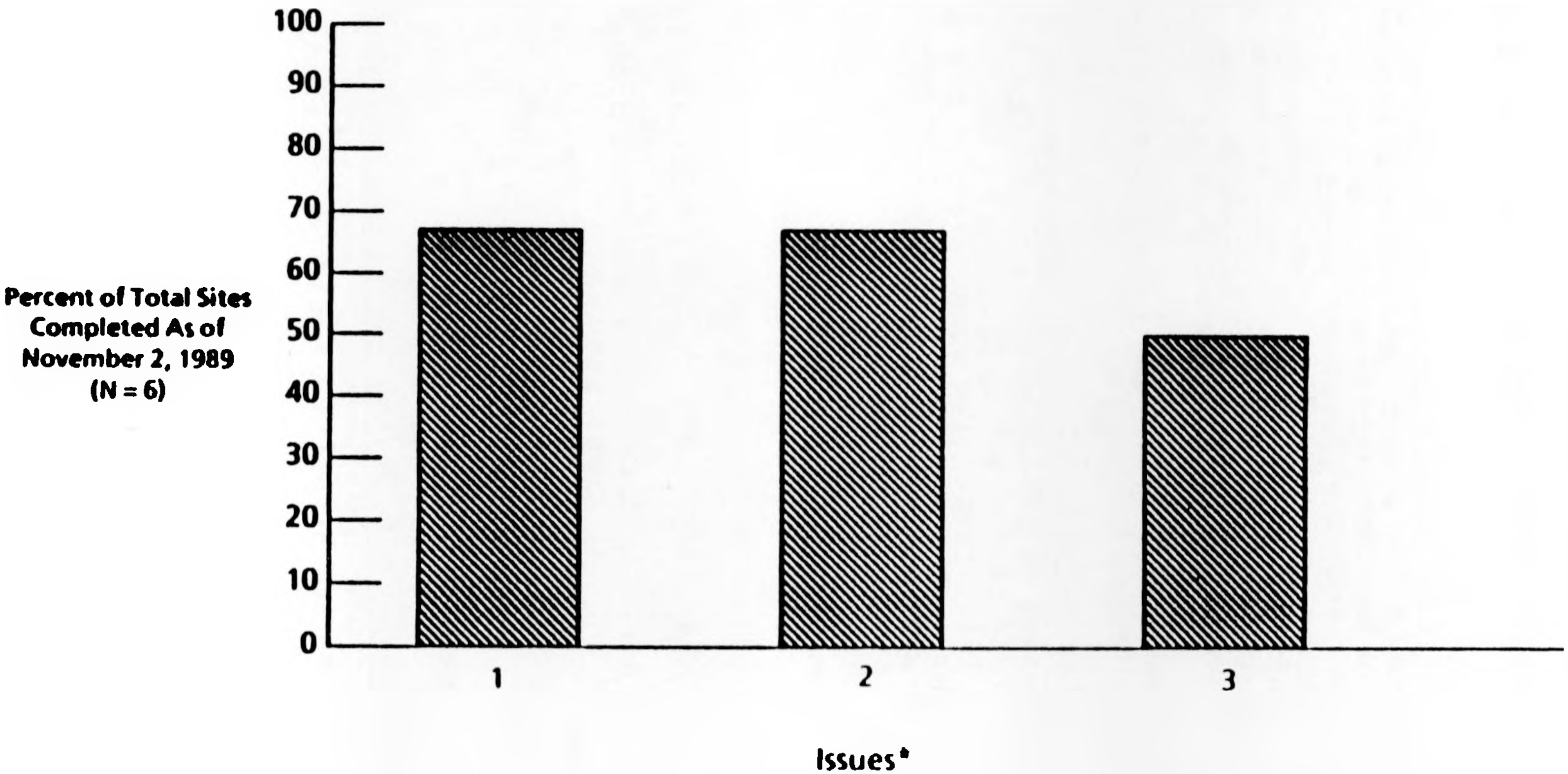
2 Lack of Policy Direction: 67% of the facilities assessed to date have shown that there are problems providing ES&H policy direction, and defining ES&H policy and objectives. Findings supporting this initial trend are:

Mound DO/BMPF-2
FMPC M-3
WVDP B-1
Pantex M/BMPF-1

3 Award Fee Process: 50% of the facilities assessed to date have shown that there are problems in administering the award fee process of the are areas that could be improved. Findings supporting this initial trend are:

FMPC M-2
Pantex M/BMPF-7
RFP 3.2-4

Management Team - Communication of ES&H Objectives



*Legend for Compliance Issues
1 Communication of ES&H Policy and Objectives
2 Lack of Policy Direction
3 Award Fee Process

PRELIMINARY TREND ANALYSIS
DOE TIGER TEAM ASSESSMENTS

MANAGEMENT TEAM - RESOURCES

The resource area of the Management and Organization Assessment deals with resource planning systems, formal training programs for ES&H activities, and long-range planning to assure that ES&H activities are being incorporated in facility operations. In addition to staff resources (sufficient in numbers and qualifications), funding for ES&H activities was reviewed. For example, were there sufficient funds available to carry out ES&H activities to the fullest extent, or are the operating contractors shifting funding from production/operations to ES&H activities to meet ES&H shortfalls.

Findings in the resources assessment area generally fall into three (3) groups.

1 <u>Lack of Qualified Personnel</u>: 100% of the facilities assessed to date have a problem in staffing in sufficient numbers and qualifications to carry out ES&H program activities in a manner which will assure full compliance with all requirements. Findings supporting this initial trend are:

FMPC M-5	Pantex M/BMPF-9	WVDP C-1
FMPC M-6	Pantex M/BMPF-10	WVDP C-4
WVDP C-2	Y-12 6.5.10	
RFP 3.3-3	Mound O/BMPF-2	

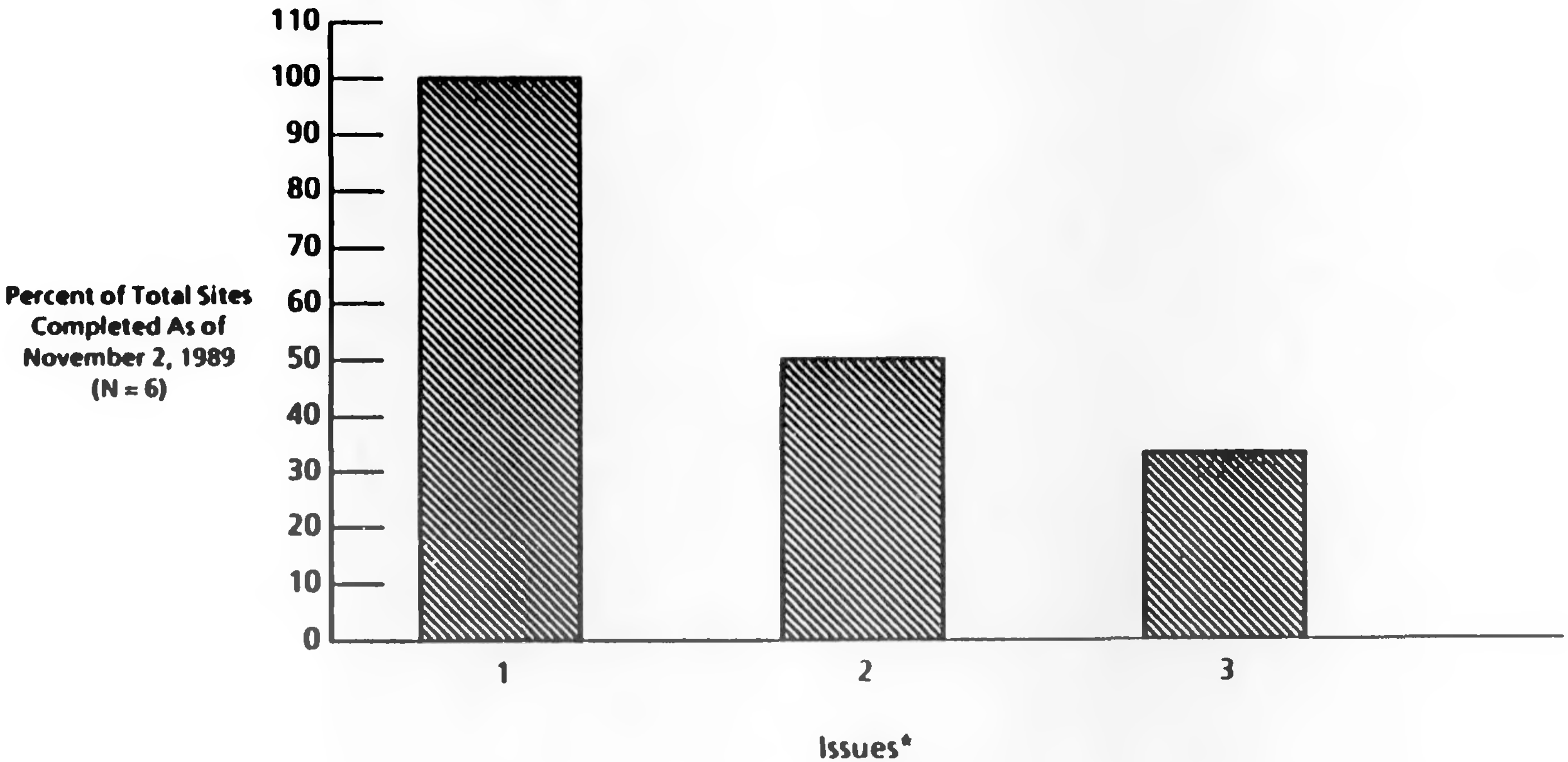
2 <u>Training</u>: 50% of the facilities assessed to date have shown that there is a lack of sufficient training in the ES&H activity area. Findings supporting this initial trend are:

FMPC M-4
Mound O/BMPF-1
Y-12 6.5.12

3 <u>Lack of Sufficient Funding for ES&H</u>: 33% of the facilities assessed to date indicated that there were insufficient funds to carry out a comprehensive ES&H program to assure full compliance. In several instances funds were being shifted from other programs to implement certain ES&H functions. Findings supporting this initial trend are:

WVDP C-3
Y-12 6.5.1

Management Team - Resources



*Legend for Compliance Issues
1 Lack of Qualified Personnel
2 Training
3 Lack of Sufficient Funding for ES&H

PRELIMINARY TREND ANALYSIS
DOE TIGER TEAM ASSESSMENTS

MANAGEMENT TEAM - ES&H ASSESSMENT

The ES&H assessment area of the Management and Organization Assessment reviewed contractor and DOE ES&H oversight programs, surveillance policies, and ES&H performance feedback and corrective action systems which may have been in place. The level of self-assessments and independent reviews and the manner in which noted deficiencies are tracked to remediation was reviewed. In addition, the level of management involvement (walkthroughs) and the use of lessons learned from the commercial sector was also reviewed.

Findings in the ES&H assessment area generally fall into two (2) groups.

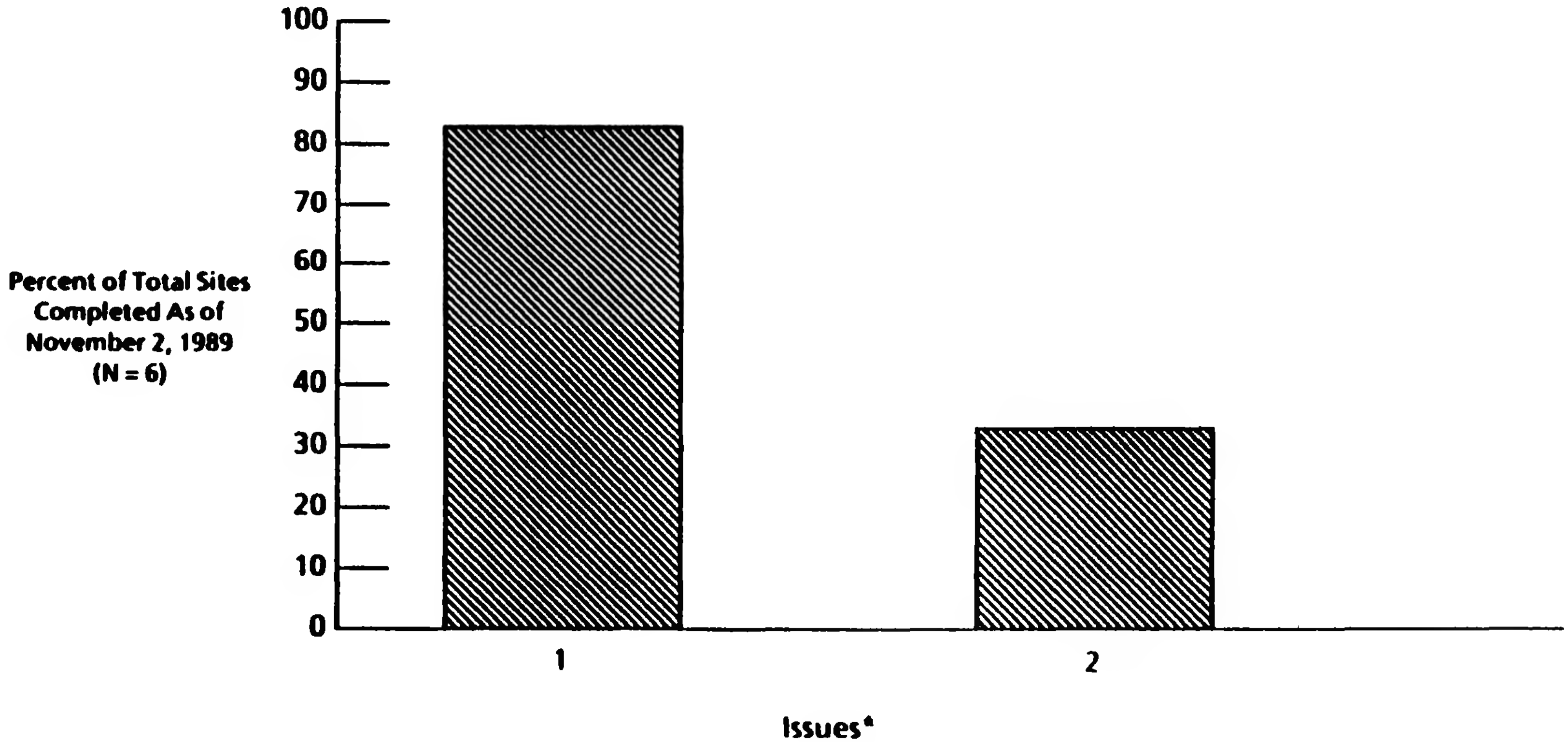
1 <u>ES&H Tracking and Reporting Systems</u>: 83% of the facilities assessed to date have insufficient systems in place to track and report ES&H activities and required ES&H corrective actions. Findings supporting this initial trend are:

FMPC M-1
Pantex M/BMPF-11
Mound RC/BMPF-1
RFP 3.2-7
Y-12 6.5.4
Y-12 6.5.5

2 <u>Self-Assessments</u>: 33% of the facilities assessed to date do not have adequate self-assessment programs in place to assure that ES&H deficiencies are identified. Findings supporting this initial trend are:

WVDP D-1
RFP 3.2-5

Management Team - ES&H Assessment



*Legend for Compliance Issues
1 ES&H Tracking and Reporting Systems
2 Self-Assessments

PRELIMINARY TREND ANALYSIS
DOE TIGER TEAM ASSESSMENTS

MANAGEMENT TEAM - ES&H CRITERIA

The ES&H criteria area of the Management and Organization Assessment dealt with the adequacy of the definition and enforcement of ES&H policies and standards, and responsibility and accountability for ES&H activities. The management systems which may have been in place to assure that operating limits and permit restrictions were defined and adhered to were reviewed. In addition, systems for ES&H assurance on facility/ site modification and plant configurations were also reviewed.

Findings in the ES&H criteria area generally fall into two (2) groups.

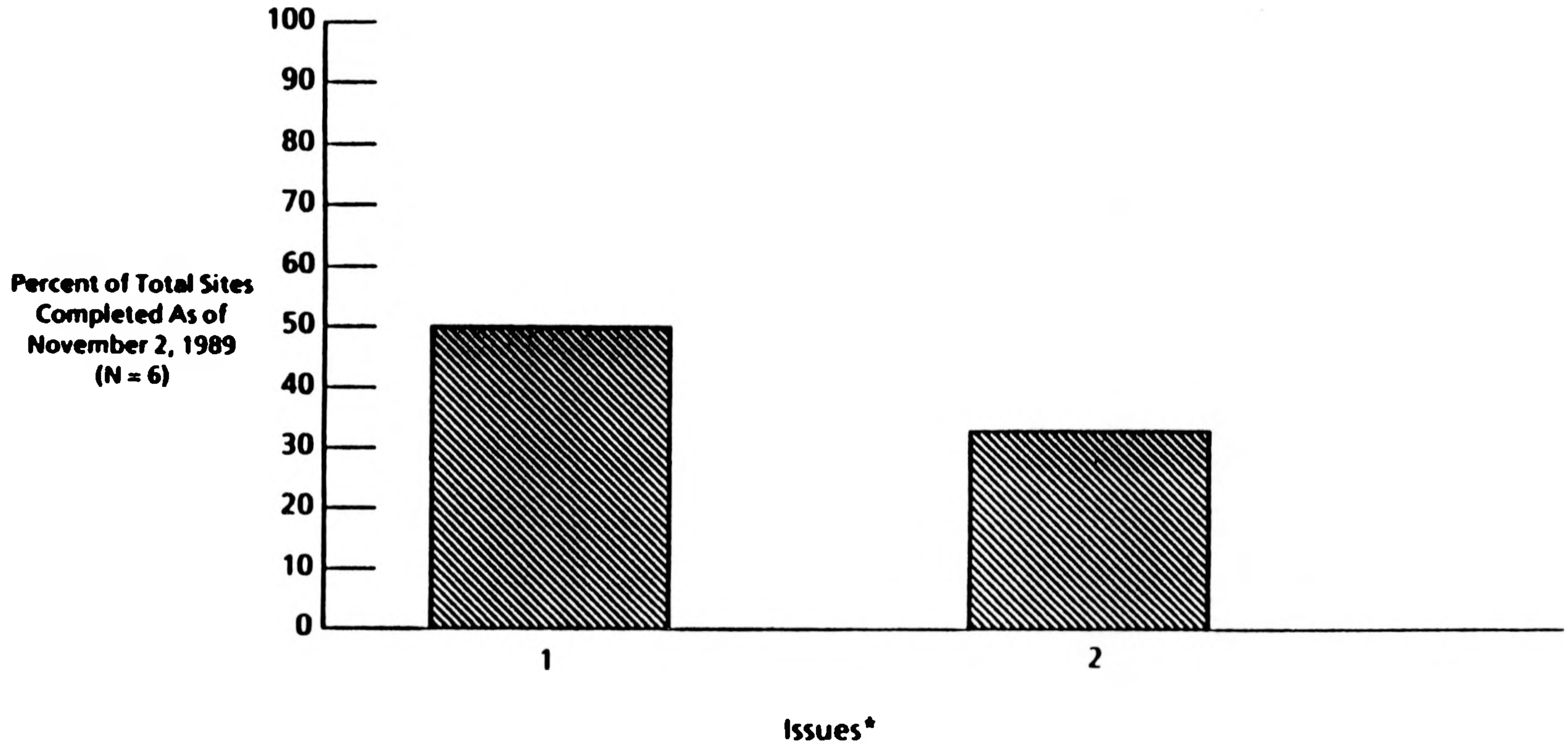
1 <u>ES&H Policies/Standards</u>: 50% of the facilities assessed to date did not have adequate written ES&H policies or standards to assure that ES&H was being incorporated into all activities. Findings supporting this initial trend are:

FMPC M-10
Y-12 6.5.7
RFP 3.1-1

2 <u>Configuration Management</u>: 33% of the facilities assessed to date do not have systems in place to assure ES&H is being reviewed for all plant changes which may be implemented. Findings supporting this initial trend are:

Mound RC/BMPF-2
RFP 3.2-1
RFP 3.2-2
RFP 3.2-3

Management Team - ES&H Criteria



*Legend for Compliance Issues
1 ES&H Policies/Standards
2 Configuration Management

PRELIMINARY TREND ANALYSIS
DOE TIGER TEAM ASSESSMENTS

MANAGEMENT TEAM - DOE OVERSIGHT

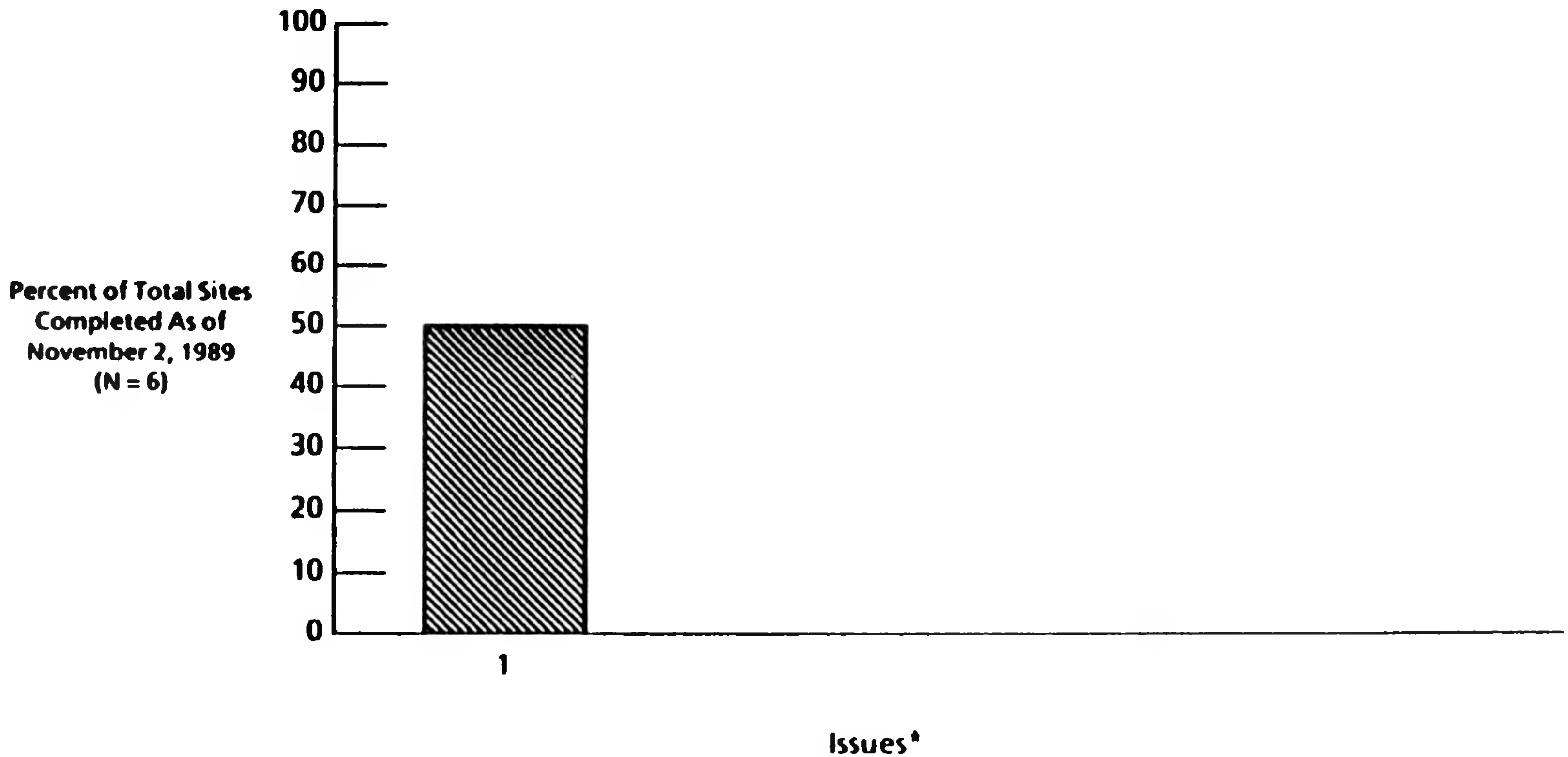
The DOE oversight area of the Management and Organization Assessment dealt with the day-to-day involvement of the DOE Operations Office and Area Office in managing ES&H activities. This included reviews of DOE guidance on ES&H activities, surveillance, and knowledge of facility status particularly with regard to ES&H activities. In addition, management support and resource commitments for ES&H activities is included in this assessment area.

Findings in the ES&H criteria area generally fall into one (1) group.

1 Insufficient Oversight: 50% of the facilities assessed to date indicate that there is insufficient oversight of contractor activities on the part of the Operations Office of the Area Office. Findings supporting this initial trend are:

FMPC M-7
RFP 3.3-2
WVDP F-1

Management Team - DOE Oversight



*Legend for Compliance Issues
1 Insufficient Oversight

U.S. Department of Energy
Washington, D.C.

Secretary of Energy
NOTICE

SEN-15-90

SUBJECT: NATIONAL ENVIRONMENTAL POLICY ACT

DATE: 2-5-90

In announcing my 10 point initiative to ensure that all Departmental activities are carried out in full compliance with the letter and spirit of environmental statutes and regulations, I indicated that many of the Department's activities under the National Environmental Policy Act (NEPA) had been carried out in a decentralized, non-uniform and self-defeating manner. I also stated my intention to become personally involved in NEPA decisionmaking, and to ensure that NEPA actions are more closely coordinated with the Governors of the states which host DOE facilities. I directed that the Department's NEPA procedures be revised to accomplish these goals and to correct the problems in NEPA compliance which had been previously identified.

After a thorough review of the Department's NEPA procedures and past practice (including DOE Order 5440.1C, the DOE NEPA Guidelines and relevant Departmental guidance memoranda), I am convinced that the Department's line organizations, which have the responsibility for preparation of NEPA documents, have not sufficiently incorporated the requirements of NEPA into the planning process for new projects at the various DOE sites. Every line manager and employee must understand that, as with all other environmental and safety requirements, compliance with NEPA should be entirely consistent with efficiency in achieving mission goals <u>if</u> NEPA requirements are considered early in the planning process. Indeed, mission goals are best served by early and adequate NEPA planning, which avoids the delays that often follow eleventh hour consideration of NEPA requirements, the resulting failure to comply fully with those requirements and, ultimately, the necessity to cure NEPA-related deficiencies before an important project may proceed. If the Department is to err in its judgment as to the extent of NEPA review required of new projects, it should err on the side of full disclosure and complete assessment of environmental impacts.

Therefore, in order to correct the deficiencies and accomplish the objectives discussed in my 10 point initiative, I am directing that the following revisions be made in the Department's NEPA compliance procedures:

<u>I. REVISIONS TO DOE ORDER 5440.1C</u>

A. Any prior delegations of authority from Secretarial Officers[1] to operations office managers to approve Memoranda-to-File (MTF) are

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[1] For purposes of this Notice, Assistant Secretaries, Directors of the Offices of Environmental Restoration and Waste Management, Energy Research, New Production Reactors and Civilian Radioactive Waste Management, as well as the Administrators of the Western Area Power Administration and the Bonneville Power Administration, are considered to be Secretarial Officers.

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withdrawn. The operations office managers will retain the authority to make decisions regarding the appropriate level of NEPA documentation only for those categories of actions specifically listed in Section D of the DOE NEPA guidelines. This authority may not be redelegated. Each decision to apply a categorical exclusion or other Section D category will be documented and reported to the appropriate Secretarial Officer and EH-25 within two weeks. Within two weeks thereafter, EH will indicate in writing to the appropriate operations office manager and Secretarial Officer any objection to the use of the Section D category. (As indicated in paragraph IIC, the "catch-all" categorical exclusion will be eliminated and effective immediately is not to be used. The list of categorical exclusions will be supplemented and the language of the exclusions will be reviewed to assure that the need for subjective judgment is minimized.) Notwithstanding EH oversight responsibilities, which shall include periodic NEPA compliance audits, Secretarial Officers will be responsible for monitoring the application by the operations office managers of Section D categories in their respective program areas.

B. The use of MTFs will terminate as of September 30, 1990 (end of FY 1990). Until MTFs are eliminated, Secretarial Officers will make decisions regarding whether MTFs are appropriate and will approve MTFs when appropriate, i.e. only when the proposed action is clearly insignificant from an environmental impact point of view. This authority may not be redelegated. All MTFs will immediately be sent to EH, which will monitor compliance of the programs with the established criteria for use of MTFs and within two weeks of receipt of an MTF report any non-compliance to the responsible Secretarial Officer and to the Secretary.

C. For actions not covered by Section D of the DOE NEPA Guidelines, EH-1 will make all determinations whether to prepare Environmental Assessments (EAs) or Environmental Impact Statements (EISs), based upon recommendations of the Secretarial Officers. EH will raise significant or controversial proposals to the Secretary for his decision whether to proceed initially with an EA or EIS.

D. Secretarial Officers will be responsible for ensuring that appropriate NEPA reviews are performed early in the project planning process so that required NEPA documentation can be prepared in a timely fashion. Secretarial Officers will review all FY 1990 and FY 1991 projects to verify that NEPA compliance planning has been incorporated into project planning and will provide a status report to EH-1, with a copy to the Secretary, within 90 days. EH will monitor project planning within the project management system administered by MA through DOE Order 4700.1, to ensure that NEPA milestones are incorporated into project planning documents. The internal budget review process will include a mandatory NEPA status report, reviewed by EH, to ensure that project schedules include appropriate NEPA compliance planning.

E. Each headquarters office having NEPA responsibilities and each operations office will augment its environmental compliance staff as appropriate so that a variety of environmental disciplines is represented sufficient to ensure (1) that the preparation of NEPA documents is properly supervised and (2) that the documents are technically complete and accurate before they undergo EH review. A NEPA Compliance Officer will be designated in each headquarters office having NEPA responsibilities and in each operations office.

F. Secretarial Officers will forward EAs and EISs to EH-1 for approval. On a monthly basis, EH-1 will report to the Secretary in writing regarding each EA or EIS that is expected to be forwarded for EH-1 approval during the ensuing 90 days. The Secretary personally will approve all programmatic and site-wide EISs, and any other EAs or EISs identified either by EH or through the Secretary's review of the EH monthly report which warrant Secretarial approval. Whenever EH determines that an EA or EIS forwarded by a Secretarial Officer should be disapproved for lack of compliance with the requirements of NEPA and is returned to the responsible office for revision, a copy of the memorandum to the Secretarial Officer notifying him/her of the deficiencies in the document will be sent to the Secretary.

G. Secretarial Officers will determine whether a field office or the responsible headquarters office should more appropriately have responsibility for initial preparation of the required EA or EIS, based upon criteria to be developed by EH within 90 days.

H. Following completion of each EIS, the responsible Secretarial Officer will prepare an action plan for implementation of any commitment(s) made in the EIS/Record of Decision for mitigation of environmental impacts associated with the project. A copy of the action plan will be sent to EH. Each office responsible for preparing an EIS will also be responsible for tracking, and submitting related annual reports to EH regarding, the progress made in implementing the action plan. The same procedures will be used for any EA/Finding of No Significant Impact (FONSI) for which the FONSI is based, in significant part, on the commitment to take mitigative actions.

I. EH will have the responsibility for ensuring consistency in the agency-wide application of NEPA. As part of this task, EH will review on a continuing basis and, where necessary, augment its two-volume NEPA Compliance Guide, which shall be used by all Secretarial Officers and their organizations as guidance in the preparation of NEPA documents. EH will also develop training programs to assure that all personnel (headquarters and field), who are responsible for NEPA compliance, understand the statute, the Council on Environmental Quality regulations, the DOE NEPA guidelines, and their responsibilities in the preparation of the various levels of NEPA documentation. Workshops will be conducted on a regular basis both in the field and at headquarters regarding NEPA compliance. In addition, where circumstances so justify, the EH Office of NEPA Project Assistance will continue to provide, upon request, guidance and assistance regarding NEPA compliance issues to Secretarial Officers and Operations Office managers.

J. DOE Order 5440.1C will be revised as appropriate by EH/GC to reflect the initiatives announced above, and submitted to the Assistant Secretary for Management and Administration within 120 days, and then to the Secretary for final approval.

II. REVISIONS TO DOE GUIDELINES

A. The DOE NEPA guidelines, revised as appropriate to reflect the initiatives announced below, will be published for public comment as proposed regulations using the notice and comment procedures of the Administrative Procedure Act. Any conforming changes necessitated by the revisions to DOE Order 5440.1C directed above should be included. A draft proposed rule should be prepared by EH/GC and submitted within 120 days for approval of the Secretary.

B. A draft agency-wide policy for development and updating of site-wide EISs will be developed by EH and submitted to the Secretary for preliminary approval within 60 days. When approved, the new policy will be incorporated into the proposed rulemaking package which will be prepared pursuant to the direction in paragraph IIA.

C. After seeking input from each Secretarial Officer, EH/GC will develop a revised and expanded list of categorical exclusions to be incorporated into the proposed rulemaking package which will be prepared pursuant to the direction in paragraph IIA. The language of the proposed categorical exclusions should be formulated so that the necessity for subjective judgment is minimized. The following categorical exclusion (the so-called "catch-all" exclusion) will be eliminated and, effective immediately, is not to be used:

> Actions that are substantially the same as other actions for which the environmental impacts have already been assessed in a NEPA document and determined by DOE to be clearly insignificant and where such assessment is still valid.

D. Scoping meetings will be required for all EISs, as will public hearings on all draft EISs. The minimum scoping period for all EISs will be 30 days.

E. All EIS implementation plans will be made public for information purposes.

F. Host states and, as appropriate, adjacent states will be notified of initial determinations regarding the level of NEPA documentation for all proposed DOE projects in the state.

G. All new MTFs prepared for the remainder of FY 1990 concerning proposed DOE projects will be sent to host states and, as appropriate, adjacent states for information purposes.

H. Each EA for proposed DOE projects will be provided to host states and, as appropriate, adjacent states for a 14-30 day comment period prior to EH (or Secretarial) approval. The length of the comment period will depend on the nature of the project evaluated in the EA and the extent of the analyses contained therein.

I. Analyses prepared pursuant to Section C.2 of the DOE NEPA guidelines to determine whether an EIS supplement is required will be made public for information purposes.

J. Pursuant to criteria to be developed by EH/GC and submitted for Secretarial approval as part of the proposed rulemaking package referred to in paragraph IIA, any deviations from the DOE NEPA Guidelines must be approved by the Secretary.

While, as described above, the Assistant Secretary, EH retains the approval authority for EAs and EISs, it should be emphasized that DOE Order 5440.1C squarely places the responsibility for preparation of timely and adequate NEPA documents on the DOE line organizations which carry out the projects analyzed in those documents. This is as it should be. Review by EH is <u>not</u> a substitute for competent, professional workmanship and supervision by the line organizations in the initial preparation of NEPA documents. I intend to hold each Secretarial Officer whose line organization is responsible for preparation of NEPA analyses personally accountable for the quality and sufficiency of those analyses. As this notice indicates, I will be notified of each instance in which a draft EA or EIS submitted by a Secretarial Officer is returned by EH for revision to cure significant deficiencies related to 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.

Incorporation of NEPA requirements early in the project planning process together with attention to detail in the initial preparation of the required documents are mandatory if the Department is to both efficiently carry out its statutory mission and serve the goal of environmental "full disclosure".

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

U.S. Department of Energy
Washington, D.C.

NOTICE

DOE N 2320.1

9-29-89
EXPIRES: 9-29-90

SUBJECT: ENVIRONMENTAL HOTLINE

The Office of Inspector General and the Office of the Assistant Secretary for Environment, Safety and Health have announced the establishment of an interim Environmental Hotline that will be operated by the Office of Inspector General. The telephone number for outside the Washington, D.C. metropolitan area is 1-800-541-1625. In the Washington, D.C. area, call 586-4073. The Hotline is operated 24 hours a day.

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.

Hotline operators at the Office of Inspector General will immediately refer your concerns to the Office of the Assistant Secretary for Environment, Safety and Health. That office will review such concerns to determine their appropriate disposition.

Heads of Contracting Activities should make this information available to all employees of the management and operating contractors under their cognizance.

JAMES D. WATKINS
Admiral, U.S. Navy (Retired)

DISTRIBUTION:

All Departmental Personnel

INITIATED BY:
Office of Inspector General
Assistant Secretary for
Environment, Safety and Health

APPENDIX G

SITES/FACILITIES WHERE ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT ACTIVITIES ARE BEING CONDUCTED

	Installation	Location
AL	Inhalation Toxicology Research Institute	Albuquerque, NM
	Kansas City Plant	Kansas City, MO
	Los Alamos National Laboratory	Los Alamos, NM
	Mound Plant	Miamisburg, OH
	Pantex Plant	Amarillo, TX
	Pinellas Plant	St. Petersburg, FL
	Sandia National Laboratory - Albuquerque	Albuquerque, NM
	Sandia National Laboratory - Livermore	Livermore, CA
	South Valley Site	Albuquerque, NM
	Waste Isolation Pilot Plant	Carlsbad, NM
CH	Ames Laboratory	Ames, IA
	Argonne National Laboratory - East	Chicago, IL
	Argonne National Laboratory - West	Idaho Falls, ID
	Battelle Columbus Laboratories	Columbus, OH
	Brookhaven National Laboratory	Upton, LI, NY
	Fermi National Accelerator Laboratory	Chicago, IL
	Hallam Nuclear Power Facility	Lincoln, NE
	New Brunswick Laboratory	New Brunswick, NJ
	Piqua Nuclear Power Facility	Piqua, OH
	Princeton Plasma Physics Laboratory	Princeton, NJ
ID	Component Development & Integration Facility	Butte, MT
	Grand Junction Project Office	Grand Junction, CO
	Idaho Chemical Processing Plant	Idaho Falls, ID
	Idaho National Engineering Laboratory	Idaho Falls, ID
	West Valley Demonstration Project	West Valley, NY
NV	Nevada Test Site	Las Vegas, NV
OR	Feed Materials Production Center	Fernald, OH
	Niagara Falls Storage Site	Niagara Falls, NY
	Oak Ridge Gaseous Diffusion Plant	Oak Ridge, TN
	Oak Ridge National Laboratory	Oak Ridge, TN
	Paducah Gaseous Diffusion Plant	Paducah, KY
	Portsmouth Gaseous Diffusion Plant	Portsmouth, OH
	Weldon Spring Site Remedial Action Project	St. Louis, MO
	Y-12 Plant	Oak Ridge, TN
RF	Rocky Flats Plant	Denver, CO
RL	Hanford Reservation	Richland, WA
SAN	Atomics International	Canoga Park, CA
	General Atomics	San Diego, CA
	General Electric Vallecitos Nuclear Center	Vallecitos, CA
	Laboratory for Energy-Related Health Research	Davis, CA
	Lawrence Berkeley Laboratory	Berkeley, CA
	Lawrence Livermore Laboratory	Livermore, CA
	Energy Technology Engineering Center	Santa Susana, CA
	Stanford Linear Accelerator Center	Palo Alto, CA
SR	Savannah River Site	Aiken, SC

APPENDIX G

SITES/FACILITIES WHERE ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT ACTIVITIES ARE BEING CONDUCTED

FUSRAP Sites:	Location
Albany Metallurgical Research Center	Albany, OR
University of California *	Berkeley, CA
Acid/Pueblo Canyon *	Los Alamos, NM
Bayo Canyon *	Los Alamos, CA
Chupadera Mesa	White Sands Missile Range, NM
Hazelwood (Latty Avenue), MO	Hazelwood, MO
St. Louis Airport Storage Site	St. Louis , MO
St. Louis Airport Storage Site Vicinity Properties	St. Louis , MO
Mallinckrodt, Inc.	St. Louis, MO
University of Chicago *	Chicago, IL
National Guard Armory	Chicago, IL
General Motors	Adrian, MI
Niagara Falls Storage Site Vicinity Properties	Lewiston, NY
Ashland Oil Co. #1	Tonawanda, NY
Ashland Oil Co, #2	Tonawanda, NY
Seaway Industrial Park	Tonawanda, NY
Linde Air Products	Tonawanda, NY
Universal Cyclops	Aliquippa, PA
W. R. Grace & Co.	Curtis Bay, MD
Middlesex Landfill	Middlesex, NJ
Middlesex Sampling Plant	Middlesex, NJ
Du Pont & Company	Deepwater, NJ
Maywood	Maywood, NJ
Kellex/Pierpont *	Jersey City, NJ
Wayne/Pequannock, NJ	Wayne/Pequannock, NJ
Colonia, NJ	Colonia, NJ
Seymour Specialty Wire	Seymour, CT
Shpack Landfill	Norton, MA
Ventron, Beverly, MA	Beverly, MA

* Completed

Other Sites	Location
Ross Aviation	Albuquerque, NM
Tonopah Test Range	Nellis Air Force Base, NV
Johnston Atoll	Johnston Atoll
Amchitka Island	Amchitka Island, AK
Project GNOME Site	Carlsbad, NM
Project Shoal Site	Fallon, NV
Tatum Dome	Tatum Dome, MS
Project GASSBUGGY Site	Farmington, NM
Central Nevada Test Area	Central Nevada Test Area, NV
Project Rulison Site	Grand Valley, CO
Project RioBlanco Site	Rifle, CO
Reactive Metals Inc.	Ashtabula, OH
Center for Energy and Environmental Research	Mayaguez, PR
Kauai Test Facility	Kauai, HI
Maxey Flats	Maxey Flats, KY

SITES/FACILITIES WHERE ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT ACTIVITIES ARE BEING CONDUCTED

	UMTRA Sites:	
	Lakeview, OR Lowman, ID Salt Lake City, UT Green River, UT Mexican Hat, UT Grand Junction, CO Naturita, CO Slickrock, CO Durango, CO Gunnison, CO Rifle, CO Maybell, CO Monument, AZ Tuba City, AZ Ambrosia Lake, NM Shiprock, NM Riverton, WY Spook, WY Bowman, ND Belfield, ND Edgemont, SD Falls City, TX Canonsburg, PA	

ACRONYMS AND INITIALISMS

ACHD	Alameda County Health Department
ACO	Administrative Consent Order
ADS	Activity Data Sheets
AEA	Atomic Energy Act
AEC	Atomic Energy Commission
AFB	Air Force Base
AIP	Agreement in Principle
AL	Albuquerque Operations Office
ALARA	as low as reasonably achievable
ANL-E	Argonne National Laboratory-East (Chicago)
ANL-W	Argonne National Laboratory-West (at INEL)
APEN	Air Pollution Emission Notices
ARARs	Applicable or Relevant and Appropriate Requirements
ASHE	Assistant Secretary for Environment, Safety and Health
BAAQMD	Bay Area Air Quality Management District
BBC	balanced biological communities
BCL	Battelle Columbus Laboratories
BDAT	best demonstrated available technology
BG	burial ground
BNL	Brookhaven National Laboratory
CA	Corrective Activities
CAA	Clean Air Act
CDC	Center for Disease Control
CDH	Colorado Department of Health
CDR	Conceptual Design Report
CEARP	Comprehensive Environmental Assessment and Response Program
CEDR	Comprehensive Epidemiologic Data Resource
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CH	Chicago Operations Office
CH	contact handled
CIF	Consolidated Incinerator Facility
CMS	RCRA Corrective Measures Study
COCA	Consent Order and Compliance Agreement
CPAF	Cost Plus Award Fee
CWA	Clean Water Act
CY	Calendar Year

D&D	decontamination and decommissioning
DFDP	Defense Facility Decommissioning Program
DHS	(California) Department of Health Services
DOD	Department of Defense
DOE	Department of Energy
DOI	Department of Interior
DOJ	Department of Justice
DOT	Department of Transportation
DP	Defense Programs
DST	double-shell tank
DT&E	Demonstration Testing and Evaluation
DUOF	Depleted Uranium Oxide Facility
DWMP	Defense Waste Management Plan
DWPF	Defense Waste Processing Facility
DWTF	Decontamination and Waste Treatment Facility
E-MAD	Engine Maintenance Assembly and Disassembly
EA	environmental assessment
EBWR	Experimental Boiling Water Reactor
EIS	Environmental Impact Statement
EM	Office of Environmental Restoration and Waste Management
EOD	Explosives Ordnance Disposal
EPA	Environmental Protection Agency
ER	Energy Research
ER	Environmental Restoration
ERDA	Energy Research and Development Administration
ETEC	Energy Technology Engineering Center (Canoga Park)
FDER	Florida Department of Environmental Regulation
FERMILAB	FERMI National Acceleration Laboratory
FFA	Federal Facility Agreement
FFCA	Federal Facility Compliance Agreement
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FMPC	Feed Materials Production Center (Fernald)
FO	Field Office
FOS	Fuel Oil Spill
FS	feasibility study
FSAR	Final Safety Analysis Report
FUSRAP	Formerly Utilized Sites Remedial Actions Program
FY	fiscal year

GE	General Electric
GJPO	Grand Junction Projects Office (Grand Junction)
GPCS	Gas Purification control system
GPP	General Plant Project
GTCC	Greater-Than-Class-C
GTF	Grout Treatment Facility
HBCU	historically black colleges and universities
HE	high explosive
HEPA	high-efficiency particulate air (filters)
HHS	Department of Health and Human Services
HLLW	high-level liquid waste
HLW	high-level waste
HNPF	Hallam Nuclear Power Facility
HQ	Headquarters
HRS	Hazard Ranking System
HSWA	Hazardous and Solid Waste Amendments
HW	Hazardous Waste
HWHF	Hazardous Waste Handling Facility
HWVP	Hanford Waste Vitrification Plant
IAG	Interagency Agreement
ICPP	Idaho Chemical Processing Plant
ID	Idaho Operations Office
IDB	Integrated Data Base
INEL	Idaho National Engineering Laboratory
IRB	Internal Review Budget
ISV	in situ vitrification
ITP	In-Tank Precipitation
ITRI	Inhalation Toxicology Research Institute (Albuquerque)
KCP	Kansas City Plant
KPDES	Kentucky Pollutant Discharge Elimination System
LANL	Los Alamos National Laboratory
LBL	Lawrence Berkeley Laboratory
LDR	land disposal restrictions
LDU	land disposal units
LECS	liquid effluent containment system
LEHR	Laboratory for Energy-Related Health Research
LET&D	Liquid Effluent Treatment and Disposal
LLNL	Lawrence Livermore National Laboratory
LLW	low-level waste

LLWDDD	Low-Level Waste Disposal Development Demonstration
LLWDF	Low-Level Waste Disposal Facilities
M&O	Management and Operating
MAD	Maintenance Assembly and Disassembly
MCL	Maximum Containment Level
MDNR	Missouri Department of Natural Resources
MI	Minority Institution
MOU	Memorandum of Understanding
MTR	Materials Test Reactor
MW	mixed waste
MWMF	Mixed Waste Management Facility
NAS	National Academy of Sciences
NBL-NJ	New Brunswick Laboratory - New Jersey
NE	Nuclear Energy
NEPA	National Environmental Policy Act
NESHAPS	National Emission Standards for Hazardous Air Polluting Substances
NJDEP	New Jersey Department of Environmental Protection
NLF	Navy Landfill
NMEID	New Mexico Environmental Improvement Division
NMWQCCR	New Mexico Water Quality Control Commission Regulations
NOx	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRC	Nuclear Regulatory Commission
NRDC	Natural Resources Defense Council
NTS	Nevada Test Site
NV	Nevada Operations Office
NWCF	New Waste Calcining Facilities
NWPA	Nuclear Waste Policy Act
NYSERDA	New York State Energy Research and Development Administration
OCRWM	Office of Civilian Radioactive Waste Management
OMA	Office of Military Applications
OMB	Office of Management and Budget
OR	Oak Ridge Operations Office
ORFTF	Oak Ridge Filter Test Facility
ORGDP	Oak Ridge Gaseous Diffusion Plant
ORNL	Oak Ridge National Laboratory
OSHA	Occupational Safety and Health Administration
OTD	Office of Technology Development
OU	Operable Unit
OWP	Office of Weapons Production

PA	preliminary assessment
PCBs	polychlorinated biphenyls
PFP	Plutonium Finishing Plant
PGDP	Paducah Gaseous Diffusion Plant (Paducah)
PNPF	Piqua Nuclear Power Facility
PORTS	Portsmouth Gaseous Diffusion Plant (Portsmouth)
POTW	publicly owned treatment works
PREPP	Processing Experimental Pilot Plant
PRP	potentially responsible party
PSD	Prevention of Significant Deterioration
PWSF	Production Waste Storage Facility
PWTF	Production Waste Treatment Facility
QA	quality assurance
QC	quality control
R&D	research and development
RA	remedial action
RAP	remedial action program
RCB	Retrieval Containment Building
RCRA	Resource Conservation and Recovery Act
RD	remedial design
RD&D	Research, Development, Assessment and Demonstration
RDDT&E	Research, Development, Demonstration, Testing and Evaluation
REA	Radiologic Engineering Assessment
RF	Rocky Flats Operations Office
RFA	RCRA Facility Assessment
RFI	RCRA Remedial Investigation
RFP	Rocky Flats Plant
RH	remote handled
RI	remedial investigation
RIR	Remedial Investigation Report
RL	Richland Operations Office
RMI	Reactive Metals, Inc.
RMW	Radioactive Mixed Waste
ROD	Record of Decision
RSWF	Radioactive Scrap and Waste Facility
RWMS	Radioactive Waste Management Site
RWQCB	Regional Water Quality Control Board
S&M	surveillance and maintenance
SAN	San Francisco Operations Office
SARA	Superfund Amendments and Reauthorization Act
SARP	Safety Analysis Report for Packaging
SCDHEC	South Carolina Department of Health and Environmental Control

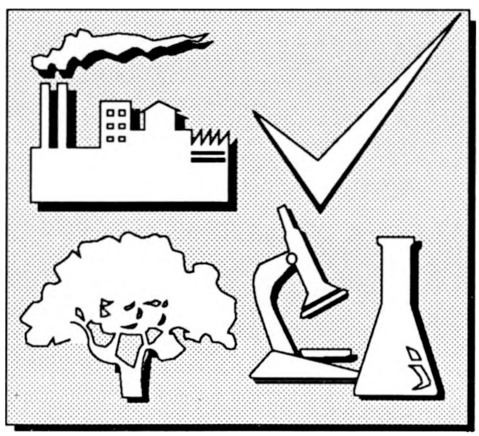
SCTI	Sodium Components Test Installation
SDWA	Safe Drinking Water Act
SEIS	State Environmental Impact Statement
SFMP	Surplus Facilities Management Program
SI	site inspection
SJCAPCD	San Joaquin County Air Pollution Control District
SLAC	Stanford Linear Accelerator Center
SNL	Sandia National Laboratories
SNLA	Sandia National Laboratories-Albuquerque
SNLL	Sandia National Laboratories-Livermore
SPCC	Spill Prevention Control and Countermeasures
SPEERA	Secretarial Panel for the Evaluation of Epidemiologic Research Activities
SPF	Sodium Process Facility
SR	Savannah River Operations Office
SRS	Savannah River Site
SSP	Site-Specific Plan
SST	single-shell tank
STGWG	State and Tribal Government Working Group
SWAT	Solid Waste Assessment Test
SWDA	Solid Waste Disposal Act
SWRB	Stormwater Retention Basin
SWSA	Solid Waste Storage Area
SWMU	solid waste management unit

TA	Technical Area
TAN	Test Area North
TCE	trichloroethylene
TD	Technology Development
TDHE	Tennessee Department of Health and Environment
TPA	Tri-Party Agreement
TRA	Test Reactor Area
TRL	Tritium Research Laboratory
TRU	transuranic(s)
TSCA	Toxic Substances Control Act
T/S/D	treatment, storage, and disposal
TTO	Total Toxic Organics
TTR	Tonopah Test Range
TWF	Transuranic Waste Facility
TWTSF	Transuranic Waste Treatment and Storage Facility

UDH	Utah Department of Health
UMT	uranium mill tailings
UMTRA	Uranium Mill Tailings Remedial Action (Project)
UMTRAP	Uranium Mill Tailings Remedial Action Program

USGS	U.S. Geological Survey
UST	underground storage tank
VCAPCD	Ventura County Air Pollution Control District
VOCs	volatile organic compounds
WACC	Waste Acceptance Criteria Committee
WAG	waste area grouping
WERF	Waste Experimental Reduction Facility
WGA	Western Governor's Association
WHPP	Waste Handling and Packaging Plant
WIN	Waste Information Network
WIPP	Waste Isolation Pilot Plant
WMFU	Waste Minimization Facility Upgrade
WMIN	Waste Minimization
WMO	waste management operations
WO	waste operations
WRAP	Waste Receiving and Processing (Plant)
WVDP	West Valley Demonstration Project
Y-12	Oak Ridge Y-12 Plant

Glossary



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GLOSSARY

Action Plan. A plan describing a specific cleanup or Corrective Activity.

Applicable or Relevant and Appropriate Requirement (ARAR). Requirements, including cleanup standards, standards of control, and other substantive environmental protection requirements and criteria for hazardous substances as specified under Federal and State law and regulations, that must be met when complying with the Comprehensive Environmental Response, Compensation, and Liability Act (from the Superfund Amendments and Reauthorization Act).

Aquifer. A geologic formation or structure that is capable of yielding water in usable quantities.

As Low As Reasonably Achievable (ALARA). A radiation protection principle applied to radiation exposures, with costs and benefits taken into account.

Atomic Energy Act (AEA). The Act (1954) which placed production and control of nuclear materials within a civilian agency, originally the Atomic Energy Commission.

Below Regulatory Concern. A level of radioactivity in waste which is considered to be safe for human exposure and, therefore, does not require monitoring or control.

Best Available Technology (BAT) or Best Demonstrated Available Technology (BDAT). Treatment technologies that have been shown through actual use to yield the greatest environmental benefit among competing technologies that are practically available.

By-Product Rule (DOE). DOE rule making (Federal Register, May 1, 1987) that established Department policy for application of the Resource Conservation and Recovery Act and the Atomic Energy Act to Department of Energy waste containing hazardous components and by-product materials.

Calcining. The process of making unconsolidated powder or granules by thermal evaporation and partial decomposition of high-level waste.

Characterization. Facility or site sampling, monitoring, and analysis activities to determine the extent and nature of the release. Characterization provides the basis for acquiring the necessary technical information to develop, screen, analyze, and select appropriate cleanup techniques.

Clean Air Act (CAA). Its purpose is to "protect and enhance the quality of the Nation's air resources." Its primary application is through Prevention of Significant Deterioration (PSD) permits to regulate new potentially polluting facilities. Of increasing importance are the National Emissions Standards for Hazardous Air Pollutants (NESHAPs). The CAA was passed in 1970 as amendments to 42 USC 7401.

Clean Water Act of 1977 (CWA). Amended the Federal Water Pollution Control Act first passed in 1956. Its objective is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." The Act's major enforcement tool is the National Pollutant Discharge Elimination Systems (NPDES) permit.

Closure Plan. Documentation prepared to guide the deactivation, stabilization, and surveillance of a waste management unit or facility under the Resource Conservation and Recovery Act.

Compliance Agreements. Legally binding agreements between regulators and regulated entities that set standards and schedules for compliance with environmental statutes. Includes Consent Order and Compliance Agreements, Federal Facilities Agreements, and Federal Facilities Compliance Agreements.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Federal statue (also known as Superfund) enacted in 1980 and reauthorized in 1986, that provides the statutory authority for cleanup of hazardous substances that could endanger public health, welfare, or the environment.

Consent Order and Compliance Agreement (COCA). See Compliance Agreements.

Continuity of Operations. Each DOE site has activities that include developing strategic and long-range waste management plans, surveillance and maintenance of facilities and equipment, waste certification, proper training programs for personnel, and record/information administration.

GLOSSARY

Cryogenic. Utilizing refrigerants to achieve very low temperatures.

Decommissioning. The process of removing a facility from operation, followed by decontamination, entombment, dismantlement, or conversion to another use.

Decontamination. The removal of unwanted material (typically radioactive material) from facilities, soils, or equipment by washing, chemical action, mechanical cleaning, or other techniques.

Defense Waste. Radioactive waste from any activity performed in whole or in part in support of DOE atomic energy defense activities; excludes waste under purview of the Nuclear Regulatory Commission or generated by the commercial nuclear power industry.

Defense Waste Management Plan (DWMP). This Plan (June 1983) established the Department of Energy's policy for storage and disposal of its defense high-level and transuranic wastes.

Depleted Uranium. Uranium from which the fissionable isotope U-235 has been removed.

Disposal. Waste emplacement designed to ensure isolation of waste from the biosphere, with no intention of retrieval for the foreseeable future, and that requires deliberate action to regain access to the waste.

DOE Orders. Internal requirements which establish DOE policy and procedures for compliance with applicable laws and regulations.

Drinking Water Standard. Concentration limits for certain elements and pollutants that may occur in drinking water; established by the Safe Drinking Water Act.

Environmentally Hardened Systems. Electromechanical systems constructed to reduce or eliminate degradation due to radiation and/or other environmental materials such as dust.

Environmental Restoration. Cleanup and restoration of sites contaminated with hazardous substances during past production or disposal activities.

Feasibility Study. A step in the environmental restoration process specified by CERCLA. The objectives of the feasibility study are to identify the alternatives for remediation and to select and describe a remedial action that satisfies the applicable or relevant and appropriate requirements for mitigating confirmed environmental contamination. Successful completion of the feasibility study should result in unimpeded subsequent development of a remedial design for implementation of the selected remedial actions.

Federal Facilities Agreement (model FFA). See Compliance Agreements.

Federal Facilities Compliance Agreement. See Compliance Agreements.

Formerly Utilized Sites Remedial Actions Program (FUSRAP). A program under the direction of the Assistant Secretary for Nuclear Energy that addresses the cleanup of sites and adjacent properties contaminated by activities of the Manhattan Project.

Friable Asbestos. Asbestos insulation that is loose and capable of becoming airborne.

Gaseous Diffusion. A technology for separating fissionable uranium-235 isotopes from the more abundant nonfissionable uranium isotopes by pumping gaseous uranium hexafluoride through resistant barriers.

Geological Repository. A mined facility for disposal of radioactive wastes that uses natural geologic barriers to provide waste containment over geological time scales.

Greater-Than-Class-C waste. Waste that exceeds the Nuclear Regulatory Commission concentration limits for Class C low-level waste as specified in 10 CFR 61.

Groundwater. Liquid water occurring beneath the earth's surface, in the interstices between soil grains, in fractures or in porous formations.

Groundwater Remediation. Treatment of groundwater to remove pollutants.

Hazardous Waste. As defined in the Resource Conservation and Recovery Act, a solid waste, or combination of solid wastes, that because of its quantity, concentration, or physical, chemical, or infectious characteristics, may cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating reversible illness or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed. Hazardous wastes may be listed or characteristic.

High-Level Waste. The highly radioactive waste material that results from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid waste derived from the liquid, that contains a combination of transuranic waste and fission products in concentrations requiring permanent isolation.

Implementation Plan. A document that contains the detailed actions needed to achieve a set of specified goals and objectives.

Inactive Waste Site. Sites formerly used for the treatment, storage, or disposal of wastes.

Incineration. A treatment technology using combustion to destroy organic constituents and reduce the volume of wastes.

Intelligent Machine. See robot.

Interagency Agreement (IAG). A formal document in which two or more Federal agencies agree to cooperate.

Land Disposal Restrictions (LDRs). Provisions of Hazardous and Solid Waste Amendments requiring phased-in treatment of hazardous wastes before disposal.

Low-Level Waste. Radioactive waste not classified as high-level waste, transuranic waste, spent nuclear fuel, or by-product material.

Low-Level Radioactive Waste Policy Amendments Act of 1985. This Act makes the Federal government responsible for disposing of greater-than-Class-C (higher-activity) low-level waste from commercial activities licensed by the Nuclear Regulatory Commission.

Master/Slaves. Any remote device (e.g., mobile vehicle, manipulator arm) which directly executes the commands of an operator. There is no computer based intelligence to assist the operator by automating all or part of a task's execution (see robot).

Memorandum of Understanding. A document stating the terms of agreement between two agencies.

Mixed Waste. Mixed waste contains both radioactive and hazardous components, as defined by the Atomic Energy Act and the Resource Conservation and Recovery Act, respectively.

National Emission Standards for Hazardous Air Polluting Substances (NESHAPS). Clean Air Act limits for release of hazardous pollutants for which no ambient air quality standard is applicable.

National Environmental Policy Act (NEPA) of 1969. Act which established the requirement for conducting environmental reviews of Federal actions that have the potential for significant impact on the human environment.

National Pollutant Discharge Elimination System (NPDES). Section 402 of the Federal Water Pollution Control Act (a.k.a. Clean Water Act) that establishes a permit for discharges to water and provides standards by which such permits may be granted.

National Priorities List. Formal listing of the nation's worst hazardous waste sites, as established by the Comprehensive Environmental Response, Compensation, and Liability Act.

Neutralization. Treatment of corrosive hazardous wastes to yield a pH near 7.

NO_x. Oxides of nitrogen NO_2, NO_3, etc.

Nuclear Waste Fund. A fund established by the Nuclear Waste Policy Act of 1982, which directed DOE to pursue a program toward disposal of commercial high-level and transuranic waste in a geologic repository. The nuclear waste fund assesses utilities a fee to pay for siting, development, and operation of a commercial repository. The share of the costs commensurate with the portion of the repository committed for disposal of defense wastes will be paid by DOE.

Nuclear Waste Policy Act. An act passed in 1982 and reauthorized in 1987 that directs the DOE to design, site and construct a geologic repository for the disposal of high-level radioactive waste and/or spent fuel from civilian nuclear reactors.

Operable Unit. A discrete portion of a site consisting of one to many release sites considered together for assessment and cleanup activities. The primary criteria for placement of release sites into an operable unit include geographic proximity, similarity of waste characteristics and site type, and the possibilities for economy of scale.

Operations Offices (DOE). Albuquerque, Chicago, Idaho, Nevada, Oak Ridge, Richland, San Francisco, and Savannah River.

Performance Assessment. A term used to denote all activities (qualitative and quantitative) carried out to 1) determine the long-term ability of a site/facility to effectively isolate the waste and insure the long-term health and safety of the public and 2) provide the basis for demonstrating regulatory compliance. Performance assessment serves as a focal point for site characterization, model development, and uncertainty analysis research activities.

Prevention of Significant Deterioration (PSD). Part C of the Clean Air Act that establishes a policy of limiting degradation of air quality based upon classification of areas.

Prime Contractor. DOE's major contractors. Principally, DOE's management and operations contractors.

Radioactive Waste. A solid, liquid, or gaseous material of negligible economic value that contains radionuclides in excess of threshold quantities. Does not include material contaminated by radionuclides from nuclear weapons testing.

RCRA Facility Assessment (RFA). The initial Resource Conservation and Recovery Act (RCRA) process to determine whether corrective action for a RCRA past practice unit is warranted or to define what additional data must be gathered to make this determination; analogous to a Comprehensive Environmental Response, Compensation, and Liability Act Preliminary Assessment and Site Inspection.

RCRA Facility Investigation (RFI). The RCRA process of determining extent of hazardous waste contamination; analogous to the Comprehensive Environmental Response, Compensation, and Liability Act Remedial Investigation.

RCRA Part A permit. The first part of a Resource Conservation and Recovery Act permit application that identifies treatment, storage, and disposal units within a to-be-permitted facility.

RCRA Part B permit. The detailed second part of a Resource Conservation and Recovery Act permit application that describes wastes managed, quantities, and facilities.

Record of Decision (ROD). The Comprehensive Environmental Response, Compensation, and Liability Act document used to select the method of remedial action to be implemented at a site after the Feasibility Study/Proposed Plan process has been completed.

Regulated Substance. Any chemical, compound, or material the manufacture, generation, transportation, alteration, or disposition of which is regulated under any of the Federal or State statutes.

Release Site. A location at which a hazardous, radioactive, or mixed waste release has occurred or is suspected to have occurred. It is usually associated with an area where the hazardous, radioactive waste, mixed waste, or waste-contaminated substances have been used, treated, stored, migrated, and/or disposed of.

Remedial Investigation (RI). The Comprehensive Environmental Response, Compensation, and Liability Act process of determining the extent of hazardous substance contamination and, as appropriate, conducting treatability investigations. The RI provides the site specific information for the Feasibility Study.

Reprocessing. The dissolution of spent reactor fuel and separation of uranium, transuranic elements, and fission products.

Robot. Electromechanical device which incorporates sensors and computer control to operate intelligently in remote environments. Typically, Human Assisted Computer Control (HACC) is used for robot control. Thus, a robot possesses sufficient intelligence to automatically execute selected tasks and is guided in the execution of these tasks by a human operator. If the environment is well defined and as the technology matures, system control responsibilities shift from the human operator to the computing system leading to more autonomous robot systems.

Safe Drinking Water Act. The maximum contaminant levels developed under this Act are used in groundwater monitoring programs.

Sanitary Waste. Wastes, such as garbage, that are generated by normal housekeeping activities and that are not hazardous or radioactive.

GLOSSARY

Shallow Land Burial. Disposal of wastes in shallow trenches; commonly used for low-level radioactive wastes.

Site. For the purposes of this plan, sites are lands, installations, and/or facilities for which the Department of Energy has or shares responsibility for Environmental Restoration and Waste Management activities.

Site Inspection. The process under CERCLA to acquire the necessary data to confirm the existence of environmental contamination at identified potential sites and to assess the associated potential risks to human health, welfare, and the environment. The data collected at each site must be sufficient to support the decision for either continuing with a remedial investigation/feasibility study or for removing the site from further investigation through a decision document.

Spent Fuel. Irradiated nuclear reactor fuel before reprocessing. Contains uranium, fission products and transuranic elements.

Sole-Source Aquifer. As defined by the Safe Drinking Water Act, an aquifer that is the only source or potential source of drinking water in an area.

Solid Waste Management Unit (SWMU). Any unit at a facility from which hazardous constituents might migrate, irrespective of whether the unit was intended for the management of solid and/or hazardous waste. Includes but not limited to container storage areas, tanks, surface impoundments, waste piles, land treatment units,landfills, incinerators, injection wells, recycling operations, miscellaneous units, and releases from such units.

Storage. Retention and monitoring of waste in a retrievable manner pending final disposal.

Superfund Amendments and Reauthorization Act (SARA). The 1986 Act amending and reauthorizing the Comprehensive Environmental Response, Compensation, and Liability Act.

Surplus Facility. Any facility or site (including equipment) that has no identified programmatic use and may or may not be radioactively contaminated to levels that require controlled access.

Toxic Substances Control Act. TSCA was enacted in 1976 to protect human health and the environment from unreasonable risk due to exposure to, manufacture, distribution, use or disposal of substances containing toxic chemicals. Under TSCA, any hazardous wastes that contain more than 50 parts per million of polychlorinated byphenyls are subject to regulation under this Act.

Transpiration. Process by which vegetation transfers water into the atmosphere.

Transuranic (TRU) Waste. Waste that is contaminated with alpha-emitting transuranium nuclides with half-lives greater than 20 years and concentrations greater than 100 nanocuries per gram of waste.

Treatment. Any activity that alters the chemical or physical nature of a hazardous waste to reduce its toxicity, volume, mobility, or render it amenable for transport, storage or disposal.

Tri-Party Agreement. An agreement signed by Department of Energy, Environmental Protection Agency, and States that identifies milestones for key waste management actions.

Underground Storage Tank (UST). Any tank or associated piping containing hazardous materials as defined by the Hazardous and Solid Waste Amendments (Subtitle C or Subtitle I).

Uranium Mill Tailings Radiation Control Act of 1978. This Act directed the Department of Energy (DOE) to provide for stabilization and control of the uranium mill tailings from inactive sites in a safe and environmentally sound manner to minimize radiation health hazards to the public. It authorizes DOE to undertake remedial actions at 24 designated inactive uranium processing sites and at an estimated 5048 vicinity properties.

Vadose Zone. The unsaturated soil zone (as opposed to the saturated or water bearing soil zone).

Vitrification. The process of immobilizing waste that produces a glasslike solid that permanently captures the radioactive materials.

Vitrify. To form into a glass-like material by heat and melting.

Waste Area Grouping (WAG). A grouping of facilities and/or release sites with areawide soil and/or groundwater contamination that is not readily traceable to individual facilities or sites. Generally, a WAG would be limited to a geographically contiguous and hydrologically defined area.

Waste Isolation Pilot Plant (WIPP). Research and demonstration facility located at Carlsbad, New Mexico, intended to demonstrate safe disposal of radioactive waste in a deep geologic environment. A decision on whether to convert the Waste Isolation Pilot Plant to a disposal facility for transuranic waste will be made after successful testing is demonstrated.

Waste Minimization. The reduction, to the extent feasible, of hazardous waste that is generated prior to treatment, storage or disposal of the waste. Waste minimization includes any source reduction or recycling activity that results in either: 1) reduction of total volume of hazardous waste; 2) reduction of toxicity of hazardous waste; or 3) both.

Waste Stream. Terminology used to refer to waste leaving a facility or operation.

Zeolites. Any of various hydrous silicates used as ion-exchangers frequently used in water softening.

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