

THE DEPARTMENT OF ENERGY ENVIRONMENTAL RESTORATION PROGRAM: MEETING THE CHALLENGES

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ABSTRACT

In August 1989, Department of Energy (DOE) Secretary James D. Watkins provided the United States Congress with the Department's first annual Environmental Restoration and Waste Management (ER&WM) Five-Year Plan. In this document, DOE committed to the goal of assessment and cleanup, within 30 years, of inactive facilities and sites contaminated by wastes generated from past DOE nuclear operations. To accomplish this goal, an integrated Environmental Restoration Program has been established which consists of two fundamental sets of activities: remedial actions at inactive waste sites, and the decontamination and decommissioning (D&D) of surplus facilities.

This paper summarizes the DOE Environmental Restoration Program, discusses the major environmental restoration challenges raised in the ER&WM Five-Year Plan, and provides a summary of recent activities initiated by DOE to meet those challenges.

THE DOE ENVIRONMENTAL RESTORATION PROGRAM

The DOE operates a large industrial complex located at various production, processing, testing, and research and development installations across the country. This complex has generated and continues to generate significant quantities of radioactive, hazardous, and mixtures of radioactive and hazardous waste (mixed waste) that must be disposed. Over the next 30 years, the DOE Environmental Restoration Program will assess and cleanup DOE facilities and sites that are contaminated with such wastes but are no longer a part of active operations, and certain other sites not owned by DOE for which the Department is responsible either through legislation, contract, or regulation.

The DOE Environmental Restoration Program is composed of remedial actions and D&D activities. Remedial actions include the assessment and clean up of inactive waste sites to meet requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); Sections 3004(u) and 3004(v) of the Resource Conservation and Recovery Act (RCRA); the National Environmental Policy Act (NEPA); the Atomic Energy Act (AEA); the Uranium Mill Tailings Remedial Action (UMTRA) Project; the Formerly Utilized Site Remedial Action Project (FUSRAP); and certain State and local regulations. The objectives of remedial actions are to identify inactive, contaminated facilities and sites; assess such facilities and sites; confine and contain contamination; clean up such facilities and sites; and provide for long-term monitoring to ensure regulatory compliance.

Past DOE nuclear operations have resulted in about 4000 contaminated sites requiring varying degrees of remedial action. In addition, the Uranium Mill Tailings

Radiation Control Act extends UMTRA activities to include more than 5000 vicinity properties.

Decontamination and decommissioning involves surplus nuclear facilities and the assessment and characterization, surveillance and maintenance, engineering, operations, and closeout activities leading to either the decontamination for reuse, or complete removal, of such facilities. Decontamination and decommissioning activities are carried out in accordance with provisions of NEPA, AEA, and DOE Orders. For facilities from which there have been releases, or that involve the treatment and disposal of hazardous wastes or substances, CERCLA, RCRA, and State and local requirements may also be applicable. The strategic objectives of the decontamination and decommissioning portion of the Environmental Restoration Program are to safely maintain contaminated facilities to limit worker, public, and environmental risk; assess facilities to determine the nature and extent of contamination; decontaminate facilities designated for reuse; and decommission all other facilities. There are approximately 500 contaminated surplus DOE nuclear facilities requiring decontamination and decommissioning.

Environmental restoration activities have initially been organized into four priority categories. Priority 1 activities are concerned with protecting workers and the public from near-term potential health risks, containing near-term offsite spread of groundwater and soil contamination, preventing unnecessary disruption of currently ongoing assessment and clean up work, and preclosure surveillance and maintenance. Priority 2 activities are required by either existing interagency agreements or agreements likely to be in place during fiscal year 1991. Activities not already assigned to priority levels 1 or 2, that will reduce the potential for health and environmental risk, promote regulatory compliance, reduce public concern, or ensure no disruption in DOE's mission, are assigned priority 3. Priority 4 includes

any activities not covered under the previous three categories. The responsibility and implementation philosophy behind the environmental restoration prioritization system is to first address actions to protect worker and public health and safety, then actions to ensure compliance, and finally, only after the above two concerns have been addressed, to conduct other activities.

Environmental restoration activities are being conducted at all major DOE installations, at several facilities not owned by DOE, and at other properties as well. A listing of the DOE installations along with the environmental restoration funding levels for fiscal year 1990 and the total amount of funds required for fiscal year 1991 through fiscal year 1995 are provided in Table I.

MAJOR ENVIRONMENTAL RESTORATION CHALLENGES

A major goal of the ER&WM Five-Year Plan is to change the DOE's traditional, unconsolidated, production-oriented approach to environmental restoration to one of open public communication, as well as full compliance with environmental laws as a priority. Coupled with this is the need for DOE to be fully responsive to evolving regulatory requirements and changing public expectations regarding environmental protection and risk acceptance. This evolution in the management of DOE's Environmental Restoration Program includes several major challenges which have been identified in the ER&WM Five-Year Plan as follows:

- Establishing an integrated Environmental Restoration Program organization within DOE Headquarters;
- Taking innovative steps to develop, motivate, and allocate needed resources for Environmental Restoration Program activities;
- Identifying technology development needs to solve environmental restoration problems more cost effectively and efficiently, and meeting such needs through a national applied research and development (R&D) program;
- Working with interested parties to develop a formal methodology for prioritizing remedial actions;
- Developing consistency in interpretation and implementation of regulations; and
- Building public confidence in DOE's ability to manage the cleanup of its inactive facilities and sites.

MEETING THE ENVIRONMENTAL RESTORATION CHALLENGES

Since publication of the Five-Year Plan in August 1989, the Department has taken aggressive action to meet the

identified challenges. The following is a brief description of the more significant recent initiatives undertaken by DOE.

Establishing an Integrated Environmental Restoration Organization

With respect to the Department's nuclear activities, the Environmental Restoration Program has historically been decentralized, falling under the responsibility of the Assistant Secretaries for Defense Programs and Nuclear Energy and the Director of the Office of Energy Research. Within these major organizations, there were various individual program offices with responsibility for conducting environmental restoration. This decentralized organizational structure resulted in fragmented management, diluted planning, and forced environmental restoration to compete for available funds with the fundamental statutory missions of these offices. This situation did not allow for comprehensive Department-wide consideration of environmental restoration requirements, resulting in uneven support for environmental restoration activities.

On November 1, 1989, the Secretary of Energy consolidated the Department's environmental restoration activities by creating the Office of Environmental Restoration and Waste Management. In addition to waste management and technology development initiatives, this new office centralizes management and planning, establishes Department-wide priorities, and consolidates funding allocations associated with the assessment and cleanup of DOE's inactive nuclear sites and facilities. Within this office, all environmental restoration activities are consolidated under the Office of Environmental Restoration, whose major objective is the effective integration of environmental restoration staff and program activities.

Mobilizing Resources

The Department has taken several recent initiatives to develop, motivate, and allocate needed resources for environmental restoration activities. These initiatives involve the mobilization of human resources as well as monetary resources.

The ER&WM Five-Year Plan acknowledges that a new strategy for budgeting environmental restoration activities needs to be developed. In response to this need, the Department is working with the Office of Management and Budget (OMB) and Congress to implement a strategy that will ensure necessary funding for program continuity and compliance with regulations. For the 1991 budget, a single Appropriation Account has been established for ER&WM, with control levels for environmental restoration activities. This single account gives the Secretary the ability to manage environmental restoration activities more effectively.

As part of its efforts to mobilize human resources, DOE has proposed that the Congress institute the "National En-

TABLE I
Summary of DOE Environmental Restoration Funding (1)

<u>Installation</u>	<u>FY 1989 Funding (\$ in Thousands)</u>	<u>FY 1990 Funding (\$ in Thousands)</u>	<u>FY 1991-FY 1995 5-Year Total (\$ in Thousands)</u>
Inhalation Toxicology Research Institute	0	185	12,615
Kansas City Plant	5,598	2,413	28,038
Los Alamos National Laboratory	7,358	11,086	164,318
Mound Plant	15,429	21,398	179,365
Pantex Plant	2,200	3,240	52,845
Pinellas Plant	800	1,200	21,117
Rocky Flats Plant	15,982	18,130	186,917
Sandia National Laboratory Albuquerque	1,884	5,042	44,955
Sandia National Laboratory Livermore	780	1,120	7,367
South Valley	150	0	8,000
Uranium Mill Tailings Remedial Action Project	85,203	73,325	465,025
Chicago Installations (Ames Laboratory, Brookhaven National Laboratory, Argonne National Laboratory-East, Fermi National Accelerator Laboratory, Argonne National Laboratory-West, Batelle Columbus Laboratory)	12,401	11,051	181,735
Idaho Installations (Idaho National Engineering Laboratory, Grand Junction Project Office)	65,650	86,254	504,134
Nevada Installations (Nevada Test Site, Eight Offsite Areas)	1,486	2,630	227,708
Feed Materials Production Center	19,392	1,379	656,259

TABLE I
Summary of DOE Environmental Restoration Funding (Continued)

<u>Installation</u>	<u>FY 1989 Funding (\$ in Thousands)</u>	<u>FY 1990 Funding (\$ in Thousands)</u>	<u>FY 1991-FY 1995 5-Year Total (\$ in Thousands)</u>
Formerly Utilized Sites			
Remedial Action Project	17,690	11,365	301,340
Oak Ridge National Laboratory	27,632	43,060	530,422
Oak Ridge Y-12 Plant	28,315	46,425	265,390
Oak Ridge Gaseous Diffusion Plant	40,386	44,633	647,013
Paducah Gaseous Diffusion Plant	10,045	20,748	141,983
Portsmouth Gaseous Diffusion Plant	12,385	17,080	82,594
Weldon Spring Site Remedial Action Project	16,272	12,425	345,306
Hanford Site 100 (Reactor) Area	4,689	22,078	284,588
Hanford Site 200 (Chemical Processing & Waste Management Area)	11,084	18,377	238,564
Hanford Site 300 (Laboratory & Fuel Fabrication Area)	3,931	10,318	119,262
Handford Site 1100 (Vehicle Maintenance Facilities Area)	2,567	1,010	18,470
San Francisco Installations (Lawrence Livermore National Laboratory, Lawrence Berkley Laboratory, Stanford Linear Accelerator Center, Energy Technology Engineering Center, and Laboratory for Energy-Related Health Research)	19,880	16,998	168,107
Savannah River Site	35,279	61,474	363,045
TOTAL	\$464,468	\$564,444	\$6,246,482

(1) U.S. DOE Environmental Restoration and Waste Management Five-Year Plan, August 1989.

Environmental Education Act" to encourage science and engineering education in disciplines essential to ER&WM activities. The scope and urgency of the national need for this legislation warrant that it receive immediate and high priority attention.

A revitalized outreach initiative by DOE is necessary to the successful accomplishment of DOE's Environmental Restoration Program. A major step in this initiative is the recent establishment of the pilot regional university-laboratory-field office partnerships in New Mexico and South Carolina. The purpose of these partnerships is to develop the skill base critical to the successful implementation of DOE's Environmental Restoration Program. Other regional arrangements are planned.

To increase the percentage of students majoring in environmental-restoration-related disciplines, DOE believes it is important that more women, minorities, native Americans, the handicapped, and other under-represented groups be brought into these disciplines. It is DOE's intent to actively cooperate with regional universities, laboratories, and primary and secondary schools to expand innovative programs to encourage increased participation from these underrepresented segments of the labor market.

Establishing an Applied R&D Program

In the initial ER&WM Five-Year Plan, the Department recognized the need to establish an aggressive national program for applied research and development (R&D) to resolve major technical issues and rapidly advance beyond current technologies for cleanup of its sites and facilities. The first major step toward this goal has been the establishment, in November 1989, of the DOE Office of Technology Development within the Office of Environmental Restoration and Waste Management. The primary purpose of the Office of Technology Development is to select and support activities involving the development of solutions to specific near-term problems and more generic activities involving the discovery of new and innovative approaches to address waste management and cleanup problems on a system-wide basis.

In addition to the creation of a new organization for the management of applied R&D activities, in November 1989, DOE prepared for public review and comment a draft Applied Research, Development, Demonstration, Testing, and Evaluation (RDDT&E) Plan. This draft Applied RDDT&E Plan delineates the current state of environmental restoration and waste management technologies and sets milestones for RDDT&E resources to fulfill DOE's environmental restoration and waste management objectives.

Developing a Prioritization Methodology

The ER&WM Five-Year Plan commits to the development of a national priority system as critically important to

the efficient planning and execution of the Environmental Restoration Program. Because of resource limitations, not all waste sites and facilities can be cleaned up immediately. As a result, a prioritization methodology is needed to identify the most effective allocation of funds among competing requirements. Such a methodology should include consideration of factors connected with public health and safety; regulatory responsiveness; State, Indian tribe, community, and public concerns; and program cost.

The national prioritization system will be credible only if it is developed through an open public process. DOE is committed to broad public participation in its development of the national prioritization system, including agreement in its principal features by representatives of affected States, Indian tribes, local communities, and other responsible public interest groups. As was the case with the development of the ER&WM Five-Year Plan and the Applied RDDT&E Plan, the public will be a party to the development of the national prioritization system and will ultimately have a significant role to play in developing the factors and their relative weights.

Developing Regulatory Consensus

With more than two dozen major Federal environmental statutes and amendments enacted over the past two decades, the current regulatory framework includes a large number of implementing regulations that are applicable to the Department's nuclear installations. Often the complexity of these regulations makes them difficult to interpret. As a result, determining the appropriate effective actions to meet their requirements is very difficult. Furthermore, such regulations are frequently revised and are often open to differing interpretations from individual EPA regional offices or State regulatory bodies. The changing nature of regulatory requirements and the need to work through the various Federal and State regulatory organizations create a complex climate within which to achieve compliance. DOE believes that this complexity is an impediment to the goals of the Environmental Restoration Program.

The Department is taking action to develop a national regulatory consensus as a means for developing consistency in interpretation and implementation of regulations, for reducing their complexity, and for developing cost-effective approaches to environmental restoration activities. Achieving such a consensus will require a program of active consultation with the Congress, the various involved executive agencies, the States, Indian tribes, local communities, and responsible public interest groups.

Building Public Confidence

To build public confidence in the Department's ability to manage the environmental restoration of *its inactive*

facilities and sites, the concerns of the public must be addressed by open information exchange and public participation in the planning and decisionmaking process. In a letter to Secretary Watkins dated April 14, 1989, the governors of 10 states addressed the Department's need to restore public confidence. These governors stated that, "The magnitude, history, and nature of the nuclear ... problems make public confidence and acceptance crucial to cleanup success. The public must be fully aware of the problems. People must be convinced that cleanup solutions will ensure a safe and healthy environment. To win public confidence, the decisionmaking and review process must be open to the public. People must have the opportunity to understand the issues. They must have the chance to influence decisions relating to cleanup ... of wastes. In this effort, the affected states and Indian tribes should play a key role in public involvement and education programs." The Department agrees with the governors' statement and is working to define an effective public role and to develop the framework for public participation in the planning and decisionmaking process.

The Department has facilitated the formation of the State and Tribal Government Working Group (STGWG) to involve these organizations early in the planning and implementation process and to confirm the overall DOE responsiveness to their participation. In addition, DOE is developing a process whereby groups similar to the STGWG can participate in the formulation of the national prioritization system for the ER&WM Plan's activities. The involvement of State and Indian tribe representatives in the

development of the ER&WM Five-Year Plan and the draft Applied RDDT&E Plan, as well as the request for public comment on these documents, are examples of efforts to involve the public in the environmental restoration of DOE nuclear sites and facilities.

SUMMARY

The Department of Energy has recently acknowledged the need to change its culture, areas of emphasis, and methods of operation if it is to meet its goal of cleaning up its contaminated nuclear sites and facilities within 30 years. The preparation of the first annual DOE ER&WM Plan in August 1989; the preparation of the DOE draft Applied RDDT&E Plan in November 1989; and the establishment of the Office of Environmental Restoration and Waste Management in November 1989 were major steps in this direction. Changing the traditional course of the DOE environmental restoration effort is an evolving process. Many new and innovative initiatives have recently been undertaken. If these and other initiatives are to successfully meet the future challenges of the DOE Environmental Restoration Program, open and honest communications among DOE, interested parties, and the public are vital.

The Department is currently preparing the first annual update of the ER&WM Five-Year Plan. This update, scheduled to be available to the public in May 1990, will provide a critical assessment of progress to date, measure accomplishments against planned milestones, and establish new milestones through fiscal year 1996.