**Interagency Review
of
the Department of Energy**

**Environmental Restoration and Waste
Management Program**

**Final Report
April 29, 1992**

Interagency Review Group

**U.S. Army Corps of Engineers
Department of Defense
Department of Energy
Environmental Protection Agency
Department of Justice
Office of Management and Budget**

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, make any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

**Interagency Review
of
the Department of Energy
Environmental Restoration and Waste
Management Program**

**Final Report
April 29, 1992**

Interagency Review Group

**U.S. Army Corps of Engineers
Department of Defense
Department of Energy
Environmental Protection Agency
Department of Justice
Office of Management and Budget**

Executive Summary

This report presents the findings of the Interagency Requirements Review of the Department of Energy (DOE) Environmental Restoration and Waste Management (ERWM) Program. The review was requested by Admiral Watkins to help determine the FY 1993 funding levels necessary to meet all legal requirements. The review was undertaken by analysts from the Office of Management and Budget (OMB) and Army Corps of Engineers, reporting to an Interagency Group (IAG) of senior Administration officials concerned with environmental cleanup issues.

The purpose of the study was to determine the level of funding needed in FY 1993 for each ERWM Field Office to comply with all Federal, State, and local government legal requirements; all DOE Orders that establish standards for environment, safety and health (ES&H) management; and for prudent investments in other discretionary and management activities such as upgrading administrative buildings, information systems, etc. The study also reviewed the cost estimates supporting the ERWM proposed budget, including direct costs (labor, equipment) and indirect costs (administrative, landlord services, contractor overhead). The study did not analyze whether the Federal/State legal requirements and DOE Orders were necessary or whether the proposed clean-up remedies represent the most cost effective alternatives available.

Study Methodology

The study was conducted by OMB and Army Corps of Engineers joint review teams that visited DOE Headquarters and all major Field Offices at which ERWM activities are being conducted. The teams conducted detailed reviews with DOE site personnel, contractor personnel, Environmental Protection Agency (EPA) Headquarters and regional personnel, and representatives of the relevant State governments. The OMB/Corps teams reviewed the detailed documentation for more than 2,000 Activity Data Sheets (ADSs), and over 3,100 subactivities contained within the ADSs, which describe in detail the ERWM program. The Corps, assisted in part by OMB staff, conducted in-depth reviews of the cost estimates contained in a sample of 55 project ADSs totaling \$1 billion or about 20 percent of the ERWM program. An additional 181 ADSs were also reviewed in detail to assess DOE's cost estimating and accounting procedures over a broader range of the program. The Corps has prepared a supplemental report addressing the cost issues in greater detail. In addition, Admiral Watkins requested a separate review by the DOE Independent Cost Estimating (ICE) Team. The DOE ICE Team review covered almost 1,600 ADSs. The ICE team will publish a separate report documenting its findings.

The OMB/Corps teams' findings for each Field Office were presented to a senior interagency review group which included representatives of the Department of Energy, the Environmental Protection Agency, the Department of Defense, the Department of Justice, the Department of the Army, and the Office of Management

and Budget. The OMB/Corps teams' analysis of all Field Offices was subsequently provided to DOE and EPA personnel for their review, and adjustments to the teams' findings were made in all instances where DOE or EPA provided additional documentation of legal requirements that supported a different classification, or where new information on other needs was provided. The President's budget request for ERWM activities accommodates the appeals received from DOE or EPA in this detailed follow-up process.

The OMB/Corps review process was conducted over a three month period and involved approximately 12,500 OMB staff hours and 13,400 Corps staff hours. The separate DOE ICE Team Review extended over a two month period, involving over 48,000 staff hours of DOE and contractor personnel.

The President's FY 1993 Budget

Based on the results of this intensive interagency review, the President's FY 1993 budget provides a total of \$5.534 billion, an increase of 26 percent above enacted 1992 levels. This amount includes \$5.317 billion in the civilian and defense ERWM accounts, and \$0.217 billion in the Uranium Enrichment account. Each agency represented on the Interagency Group expressed confidence that all legal requirements, all DOE ES&H Orders, and prudent management and other discretionary ERWM activities can be funded at the \$5.534 billion level for FY 1993.

<u>FY 1993 Budget Summary (\$ millions)</u>	
<u>Environmental Restoration and Waste Management Program</u>	
Legally Required Activities	3,441
DOE ES&H Orders	458
Management & Discretionary Activities	<u>1,418</u>
Total ERWM Program	5,317
<u>Uranium Enrichment Account (UE)</u>	
Legally Required/ES&H Orders	166
Management & Discretionary Activities	<u>50</u>
Total UE	217
Grand Total	5,534

In addition, the President's FY 1993 budget provides a personnel increase of 662 full-time equivalents (FTE) over FY 1991, a 71 percent increase. The additional personnel will substantially increase management capability at the ERWM Field Offices to improve cost estimating and cost control and ensure effective management oversight of the contractors performing clean-up work.

The FY 1993 budget reflects the President's continued strong commitment to ensuring that Federal facilities live up to the same environmental standards that apply to the private sector. The FY 1993 budget level for DOE clean-up activities is more than triple the level in FY 1989 when the President came into office.

Findings on Cost Estimation

As with many new programs experiencing rapid growth, there are problems in both estimating and controlling costs and ensuring accountability in the ERWM program. Based on the OMB/Corps teams' analysis, the Interagency Group found a large number of instances of potentially excessive cost estimates, including:

1. ERWM direct program costs were over-estimated for a significant number of ADSs reviewed. An analysis of a sample of 236 ADSs, approximately 12 percent of the total number, revealed over-estimated costs for a wide variety of program activities including: haul roads; computer drafting equipment; office space; monitoring wells; construction materials and labor costs; and contractor transportation costs and profit margins.
2. All Field Offices responsible for managing ERWM programs had very high overhead costs. The analysis showed that, for the sample of 55 project ADSs, Field Office overhead costs were \$243 million, or 139 percent, higher than that of comparable Corps projects. A separate review by the DOE Independent Cost Estimating (ICE) Team identified \$350 million of overhead which represented a potential target level for reduction. Overhead costs rates were set by the Department and the Field Offices, and were not under the control of the ERWM program, but were charged to the ERWM budget.
3. The OMB/Corps teams' analysis of a sample of ADSs found very high contingency costs, and in many instances they were undocumented. The DOE ICE Team applied contingency rates averaging 19 percent which they subsequently adjusted to 10 percent as adequate to support the FY 1993 program. This represented a reduction of \$450 million.

The President's FY 1993 Budget for the ERWM Field Offices does not include undistributed reductions in the potentially excessive program, overhead and contingency costs noted above. While the IAG believed that there were potentially serious problems with the cost estimates for ERWM activities, it concluded that DOE needs additional time to put in place new cost estimating procedures and controls. The IAG made no effort to reduce cost estimates for legally required activities and DOE ES&H Orders. As estimating procedures are improved, the IAG unanimously believed that savings can be achieved even in these areas, which can be applied toward meeting future clean-up requirements.

Additional Observations

In addition to the principal findings resulting from the review, the OMB/Corps teams identified several other problems and issues, outside the originally planned scope of the study. These include:

1. The ERWM program did not appear to rigorously manage budget execution in FY 1992 to ensure compliance with required milestones. Some site personnel believed they may miss required milestones in FY 1992, due to inadequate funding allotments within the ERWM budget, even though adequate funds were provided in the President's budget request and subsequent Congressional appropriations.
2. The DOE and ERWM Field Offices appeared to have insufficient government personnel with the skills necessary to independently prepare and review cost estimates and budget requests, and to effectively oversee contractors. The lack of DOE staff with cost estimating skills may have contributed to the very high program, contingency and overhead cost estimates.
3. There were large and increasing balances of unobligated and uncosted funds from prior year appropriations in the ERWM program. DOE financial management records show a total of over \$1.7 billion in fund balances at the beginning of FY 1992. \$340 million of this balance was due to a FY 1991 supplemental appropriation enacted in April 1991. These fund balances constituted an additional 40 percent in budgetary resources available to the ERWM program in FY 1992, over and above the level of funding provided in the FY 1992 appropriation. These fund balances have not been thoroughly reviewed. Some of these funds may not be needed for the purposes originally planned. The OMB/Corps teams did not have adequate time to review these large fund balances in detail.
4. At the time of the IAG review, the ERWM Progress Tracking System (PTS) did not effectively track funding levels to legal requirements or measure accomplishments against expenditures. The system could not adequately measure actual vs. planned expenditures or match actual expenditures against individual milestones. The computer capability for PTS has now been developed, but the database had not yet been created. A fully operational PTS is essential for effective management of the ERWM program.
5. At some ERWM sites engineering design, pilot tests and other work on specific clean-up measures has been initiated years in advance of completion of the RI/FS planning process and selection of the appropriate clean-up alternative in the record of decision (ROD).

6. At the time of the IAG review, the ERWM Technology Development Program was not adequately integrated with ERWM Field Office clean-up planning to ensure full utilization of new technologies. As of the time of the completion of this report, additional efforts are underway to strengthen program planning and integration.

Recommendations for Additional DOE Management Actions

Based on the findings and observations of the OMB/Corps study teams, the IAG agreed upon six recommendations to improve cost estimation, cost control and management accountability in the ERWM program. It is expected that these measures will be implemented in FY 1993. The six recommendations are:

1. The DOE Progress Tracking System (PTS) should be implemented expeditiously, including the changes identified in a recent DOE evaluation study. These changes include: restructuring the ADSs to reflect a more logical work breakdown structure; identifying the legal requirements applicable to each ADS and subactivity; and measuring actual expenditures against planned expenditures on a monthly basis as well as measuring clean-up progress against expenditures.
2. The ERWM budget execution process should be revised to increase accountability and ensure that legal requirements are met. Two specific changes are recommended: development of a formal budget execution plan and adoption of a change control process at the ADS level.
3. DOE should conduct a more detailed analysis of Field Office overhead costs, and put in place revised overhead rates to achieve savings in FY 1993 and future years.
4. DOE, in coordination with OMB and the Corps, should develop and implement revised cost estimating methods and standards, including new guidelines covering contingencies and escalation rates, to eliminate over-estimated costs. In addition, the ERWM program should assign highest priority to hiring additional staff with cost estimating skills.
5. The ERWM program should restructure completely the planning process for the Technology Development Program to better integrate new technology development with clean-up planning at the field sites.
6. The quality of the ERWM Five-Year Plan should be improved substantially; the plan should incorporate a risk-based priority system; and the plan should be supplemented as necessary to meet the requirements of OMB Circular No. A-106.

Table of Contents

Page

	<u>Executive Summary</u>	i
I.	<u>Introduction</u>	1
II.	<u>Interagency Review and Development of the FY 1993 Budget</u>	
	Description of the IAG Review Methodology.....	10
	Final Results for the FY 1993 Budget.....	14
III.	<u>Findings and Observations on Cost Estimation and Management Issues</u>	
	<u>Findings on Cost Estimation</u>	
	1. Program Cost Estimates.....	21
	2. Overhead Cost Estimates.....	23
	3. Contingency Cost Estimates.....	28
	<u>Additional Observations</u>	31
	1. Management of Budget Execution.....	31
	2. Field Office Staffing Levels and Skill Mix.....	32
	3. Balances of Prior Year Funds.....	36
	4. ERWM Progress Tracking System (PTS).....	39
	5. Clean-up in Advance of Record of Decision.....	40
	6. ERWM Technology Development Program.....	41
IV.	<u>Field Office Summaries</u>	45
	Albuquerque, NM.....	46
	Chicago, IL.....	53
	Fernald, OH.....	59
	Idaho Field Office, ID.....	69
	Nevada Test Site, NV.....	77
	Oak Ridge, TN.....	82
	Richland, WA.....	90
	Rocky Flats, CO.....	103
	San Francisco, CA.....	109
	Savannah River, SC.....	116
	Washington, DC Headquarters.....	123

V.

<u>Recommendations for Further Action</u>	127
1. Revisions to Progress Tracking System (PTS).....	127
2. Improvements to Increase Accountability in Budget Execution..	127
3. Revisions to Overhead Cost Allocations.....	128
4. Revisions to Cost Estimating Guidelines.....	128
5. Restructuring the Technology Development Program.....	129
6. Improvements in the ERWM Five-Year Plan.....	129

I. INTRODUCTION

The President's Commitment

President Bush has made a strong commitment to cleaning up Federal facilities:

"As President, I will insist that in the future Federal agencies meet or exceed environmental standards. The government should live within the laws it imposes on others. The problem we have created is so large and so hugely expensive that we cannot expect to correct it overnight, but attack it we will, as rapidly as we can."

George Bush

Seattle, Washington, May 16, 1988

"Building a Better America" February 9, 1989

For forty years, the agencies responsible for the Government's atomic weapons program were not adequately attentive to the environmental consequences of this necessary, but nevertheless hazardous, activity. There were several causes of this inadequate attention: the country did not have the detailed knowledge base of potential environmental impacts, or the sophisticated environmental cleanup and compliance laws that exist today, or the technology to clean-up wastes effectively. There was sometimes a bias toward production of materials and weapons while the environment was not given the necessary priority in the allocation of resources.

Whatever the causes, the Administration has reversed the imbalance between production and cleanup. Secretary Watkins has made environmental clean-up a top priority of the Department of Energy (DOE) and has initiated significant steps towards this end. In June 1989, the Secretary issued a 10-point initiative resetting priorities so that environment, safety and health objectives now take precedence over production objectives. The President has substantially increased funding for the clean-up of waste at all Federal facilities and for bringing those facilities into compliance with applicable environmental laws and regulations. Funding for the DOE Environmental Restoration and Waste Management (ERWM) Program has increased from \$1.7 billion in FY 1989 to an enacted level of \$4.3 billion in FY 1992. When combined with amounts in the Uranium Enrichment account for clean-up activities, a total of \$4.4 billion was appropriated in FY 1992. The President's FY 1993 budget proposed to increase total funding by an additional 26 percent to over \$5.5 billion. This is more than triple the level of funding in FY 1989, as shown in Table 1.

Table 1

THE PRESIDENT'S FY 1993 BUDGET FOR DOE CLEAN-UP ACTIVITIES IS MORE THAN TRIPLE THE LEVEL OF FUNDING IN FY 1989.

The Enormity of the DOE Cleanup Task

The Department of Energy is faced with the largest and most complex clean-up task of any entity in the country. The Department is responsible for the management and disposal of a wide variety of radioactive and hazardous wastes. Much of this waste is "mixed waste", a combination of radioactive and hazardous materials. Mixed waste presents unique problems, because, in many cases, approved treatment technologies do not exist. The magnitude of the waste management problem is illustrated in Table 2. The ERWM program is responsible for the clean-up of both active sites and inactive facilities contaminated by past operations. This effort includes about 100 sites located in 34 States and territories, as shown in Table 3. The nature of the investigations and clean-up measures required at each site varies considerably according to such factors as location, hydrologic conditions, geology, type of contaminants, and local regulations. For example, some restoration efforts may involve simply the removal, treatment and disposal of surficial soils, while other sites may require long-term clean-up of deep groundwater at considerable cost.

DOE facilities are subject to a broad range of environmental laws and regulations, summarized in Table 4. The principal requirements governing the cleanup effort are contained in the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). RCRA is principally concerned with ongoing operations at DOE facilities. In many cases, the States have been delegated the authority to implement the provisions of RCRA. CERCLA principally governs the clean-up of environmental problems that have occurred in the past, typically problems that are not related to current operations. In addition, ERWM activities are subject to Department-wide Orders, which are formal internal directives. Many DOE Orders establish additional requirements for Environment, Safety and Health, such as worker protection. Other DOE Orders establish internal management and administrative procedures.

The Department has taken concrete steps to enter into compliance agreements with the Environmental Protection Agency (EPA) and appropriate State regulatory agencies for each site. In addition, the Department has entered into a series of agreements-in-principle with States in which it has major facilities, and with Indian Tribes who reside in the vicinity of these sites. These agreements lay out the specific steps needed to bring operating facilities into compliance with all applicable Federal and State requirements. In addition, they address urgent environmental problems that pose immediate health or environmental risks, and begin the process of long-term environmental cleanup of the sites. As of January 1992, the Department has entered into an extensive set of agreements with EPA and the States, as shown in Table 5.

The DOE Five-Year Plan Process

In 1989, the Department initiated a Five-Year Plan process for the Environmental Restoration and Waste Management (ERWM) program. The major objectives of this effort were to:

Table 2

QUANTITIES AND ACTIVITY OF DOE WASTE

BASE OF COLUMN IS THE SIZE OF A FOOTBAL FIELD

HEIGHT IS IN FEET

Table 3

**THE ERWM PROGRAM IS RESPONSIBLE FOR CLEANING UP ABOUT 100 SITES
LOCATED IN 34 STATES.**

Table 4

ERWM CLEAN-UP ACTIVITIES ARE SUBJECT TO A WIDE RANGE OF FEDERAL ENVIRONMENTAL, SAFETY AND HEALTH REQUIREMENTS.

Requirement	Major Provisions
Resource Conservation and Recovery Act (RCRA)/Hazardous and Solid Waste Amendments (HSWA)	Treatment, storage, and disposal of hazardous waste; clean-up criteria; land disposal restrictions (LDR)
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)/Superfund Amendments and Reauthorization Act (SARA)	Site investigation/hazard evaluation; clean-up criteria/ remedial alternative selection; public involvement and emergency planning
National Environmental Policy Act (NEPA)	Environmental review/public involvement in Federal actions
Clean Air Act (CAA)	Air emission standards
Clean Water Act (CWA)	Effluent discharge permitting
Safe Drinking Water Act (SDWA)	Ground water protection/water treatment standards
Toxic Substances Control Act (TSCA)	Handling and clean-up standards for toxic waste, primarily asbestos and PCB compound
Atomic Energy Act (AEA)	Production/control of radio-active materials; Radiation exposure limits; and worker/environmental health and safety
Uranium Mill Tailings Radiation Control Act	Remediation of inactive processing sites and contaminated vicinity properties
Nuclear Waste Policy Act	High-level radioactive waste disposal
DOE Orders	Internal policies and procedures for implementing applicable laws and regulations

Table 5

THE ERWM PROGRAM IS GOVERNED BY 67 SEPARATE CLEAN-UP AGREEMENTS
WITH EPA AND STATES CONTAINING ABOUT 1,200 SEPARATE MILESTONES

FIELD OFFICE AND SITE	# of Agreements With EPA & States	Milestones
ALBUQUERQUE FIELD OFFICE:		
Kansas City Plant	2	41
Los Alamos National Laboratory	1	22
Mound Plant	1	TBD
Pantex	1	52
Sandia National Lab - Albuquerque	1	TBD
Subtotal	6	115+
CHICAGO FIELD OFFICE:		
Brookhaven National Laboratory	1	9
Fernald Environmental Management Project	4	80+
IDAHO FIELD OFFICE:		
Idaho National Engineering Laboratory	2	130
Monticello Mill Site/Vicinity Props.	1	TBD
Subtotal	3	130+
OAK RIDGE FIELD OFFICE:		
Maywood NJ	1	5
Oak Ridge National Laboratory	2	72
Paducah Gaseous Diffusion Plant	2	TBD
Portsmouth Gaseous Diffusion Plant	2	47
St. Louis Airport Sites	1	TBD
Weldon Spring Site	1	TBD
W.R. Grace (Wayne), NJ	1	5
Y-12 Plant	2	NA
Subtotal	12	129+
RICHLAND FIELD OFFICE:		
Hanford Site	3	545+
Rocky Flats Plant	6	200
SAN FRANCISCO FIELD OFFICE:		
Lawrence Livermore National Laboratory	3	11
Savannah River Site	29	1
Total	67	1220+

Note: Milestones refer to the submission of reports and other legal documents associated with the clean-up process. In some cases, these are to be determined (TBD) during the investigation process or are otherwise not stated explicitly in the agreement.

- define the specific activities needed to implement compliance agreements and meet all legal requirements;
- develop preliminary cost estimates; and
- facilitate an ongoing dialogue with EPA, the States and Indian tribes on cleanup activities.

In August 1991, DOE issued the third annual edition of the Environmental Restoration and Waste Management Five-Year Plan. The August 1991 Five-Year Plan included two alternative funding levels for the period FY 1993 to FY 1997. The first, called the Preliminary Unvalidated Case, was a preliminary Field Office estimate of the funds the Field Office would like to have to implement all activities contained in the Five-Year Plan. The second estimate, called the Validated Target Level, was based on the outyear budget projections contained in the President's FY 1992 budget. This estimate was developed to remain within overall funding targets and also was prepared by Field Office personnel.

The DOE FY 1993 Budget Request and the ADS Review

The Five-Year Plan was intended to serve as a planning tool in the development of the budget. It was widely recognized that the cost estimates contained in the Five-Year Plan were very preliminary estimates of the resources either needed or desired by the Field Offices. Better quality estimates would be developed in the formal internal DOE budget preparation process.

The ERWM Program believed that it would not be able to meet legal, health, safety, environmental and management funding needs at the funding levels contained in the official DOE budget request to OMB for FY 1993. However, when asked for information to document this concern, the ERWM program stated that no detailed information on legal requirements and funding needs existed at DOE Headquarters to permit an assessment of this problem. OMB, and the Secretary of Energy's Office, requested on several occasions the documentation that would provide a connection between legal requirements and funding needs.^{1/} As a result, the ERWM program reviewed the program Activity Data Sheets (ADSs) to determine the funding level needed to meet all legal requirements, DOE Orders and discretionary activities; however, appropriate documentation was not available.^{2/} The ERWM report, issued on September 4, 1991, entitled "The FY 1993 ADS Review," identified a Program Planning Level (PPL) of \$5.8 billion desired by the ERWM Program. However, the ADS Review

^{1/}OMB Associate Director Robert E. Grady requested detailed written documentation in letters to various DOE officials on August 7, 1991, September 11, 1991, September 16, 1991, and October 1, 1991.

^{2/}A letter from Mr. James Dieckhoner, Acting Director, Office of Planning and Resource Management, Office of Environmental Restoration and Waste Management, received on October 17, 1991, by OMB stated: "This letter replies to your request for copies of any backup material to the subject report which supports the categorizations of: legally required; required by DOE ES&H Orders; or discretionary. The categorization decisions were based on interviews with Headquarters staff, in some instances augmented by conversations with field personnel. No written records were generated as backup to this process, other than the ADS's themselves." (Emphasis added.)

process was a fast-paced review undertaken by selected ERWM Headquarters personnel and did not involve on-site reviews at the ERWM Field Offices, or consultation with EPA or the States. On-site reviews would have been particularly important for a study of this type because the vast majority of the information is at Field Offices, and not at DOE Headquarters. In addition, little detailed documentation was developed to support the conclusions cited in the ADS Review. Importantly, for example, the ADS Review did not look at sub-activities contained within each ADS. It simply examined whether any legal requirements were contained in an ADS. If the majority of the ADS was legally required, the entire dollar amount of the ADS was considered to be legally required.

The Need to Validate Requirements and Budget Estimates for FY 1993

As a result of these separate processes--the Five-Year Plan, the ADS review and the official 1993 DOE budget request to OMB--three alternative funding estimates were proposed for the ERWM program.

• ERWM Preliminary Unvalidated Case	\$6,693M
• ERWM Program Planning Level (PPL)	\$5,807M
• DOE budget request to OMB	\$4,709M

(These estimates covered ERWM-funded activities only, and excluded clean-up activities funded in the DOE Uranium Enrichment account).

There was considerable uncertainty about what level of funding was needed to meet program requirements, since none of the three levels were supported by the detailed documentation that normally accompanies funding level requests of this magnitude in other Federal programs. In addition, it was becoming apparent that problems were arising in tracking activities, ensuring accountability, estimating and controlling costs in a fast growing program, and managing the large and complex task of cleaning up the sites.

In order to ensure that legal requirements were met and to obtain a thorough analysis of program costs, Secretary Watkins quickly initiated two separate follow-up actions:

- (1) A request to OMB to undertake an independent review of program requirements and funding estimates; with the assistance of the Army Corps of Engineers; and
- (2) A directive for an independent, internal DOE cost review, to be undertaken by the DOE Independent Cost Estimating (ICE) Team.

II. INTERAGENCY REVIEW AND DEVELOPMENT OF THE PRESIDENT'S FY 1993 BUDGET

The President's FY 1993 budget for the ERWM Program was determined through an intensive interagency review process. The review was conducted by teams of OMB and Corps of Engineers personnel, coordinated by an Interagency Group (IAG) of senior policy officials from the major Federal agencies concerned with cleanup efforts at Federal facilities--the Environmental Protection Agency, the Department of Defense, the Department of Justice, the Department of Energy, the Department of the Army-Civil Works and the Office of Management and Budget.

The overall goals of the review process were to:

- Continue the President's commitment to clean up Federal facilities as quickly as possible;
- Develop a FY 1993 budget adequate to meet all legal requirements, DOE ES&H Orders and a prudent level of DOE Management Orders and discretionary activities; and
- Put in place the capacity to understand and track milestones and ongoing commitments, and relate site activities to actual expenditures.

To achieve these goals, two specific objectives were established:

- (1) Determine funding levels necessary to meet all applicable legal requirements, including compliance agreements; court orders or consent decrees; Federal statutes and regulations; State statutes and regulations; and DOE Environment, Safety and Health (ES&H) Orders; and
- (2) Assess the reasonableness of program indirect costs, including overhead, contingency and other costs contained in the spending estimates for ERWM activities.

Description of the IAG Review Methodology

The review was conducted by teams of OMB and Corps personnel through the use of a detailed questionnaire, Field Office visits and on-site interviews, budget hearings, analysis of legal documents and DOE Orders, analysis of cost estimates and separate meetings with EPA and State regulatory personnel. Each is discussed in more detail below.

DOE Questionnaire: A detailed questionnaire was sent to each of the ERWM Field Offices by the DOE Under Secretary. The questionnaire included a series of questions designed to obtain basic information on each ADS and each sub-activity within an

ADS. The questionnaire requested that Field Office personnel classify each ADS and sub-activity into one of nine requirements categories so that it would be possible to match sub-activities to specific legal and regulatory requirements. The nine requirements categories contained in the questionnaire are described in Table 6. The nine requirements categories included four legally required categories. In addition, the analysis sub-divided DOE Orders (Category 5) into two sub-categories: DOE Environment, Safety and Health (ES&H) Orders, and DOE Management Orders. Three separate categories were provided for non-legally required activities. Finally, a special category was established to track new or revised compliance agreements under negotiation.

The questionnaire requested the specific legal documentation for each ADS and sub-activity, to better ascertain what was required. In addition, the questionnaire requested information on milestones, cost estimates to meet milestones, status of cleanup activities, and status of compliance for waste management activities.

On-site Reviews: Joint OMB/Corps review teams made 2-5 day visits to each ERWM Field Office to receive first-hand information on site conditions and needs. This was done to validate the questionnaire responses and ascertain the validity of the legal basis for each sub-activity and the reasonableness of cost estimates. The teams met with key DOE Field Office managers and staff, as well as DOE Management and Operating (M&O) contractor personnel. The OMB/Corps teams also consulted with personnel from both EPA Headquarters and the appropriate Regional Office and officials from the appropriate State regulatory agencies, to ensure that the teams had a complete understanding of legal and regulatory requirements and milestones. At the ERWM Field Offices, the OMB staff, with assistance from the Corps, reviewed legal requirements for each ADS and sub-activity, including all available supporting documentation, and cost information. This information was used to validate the proposed classification by DOE of each ADS sub-activity into one of the nine requirements categories. The Corps conducted more detailed analysis of the cost estimates for activities described in selected ADSs. The Corps also reviewed indirect costs, including overhead, escalation and contingency rates, comparing these estimates with costs for similar projects conducted by the Corps.

IAG Briefings: The OMB/Corps teams presented their findings for each of the DOE Field Offices to an Interagency Group of senior Administration officials. The IAG included OMB Associate Director Robert E. Grady, former DOE Deputy Secretary W. Henson Moore, DOE Assistant Secretary Leo Duffy, EPA Deputy Administrator Henry Habicht, DOJ Acting Assistant Attorney General Barry Hartman, DOD Principal Deputy Assistant Secretary David Berteau and Army Assistant Secretary for Civil Works Nancy P. Dorn.

The OMB/Corps presentations to the IAG followed a common format, including the following elements:

- A description of the site and its environmental problems;

Table 6

**THE DOE QUESTIONNAIRE CLASSIFIED ALL ADSs AND SUB-ACTIVITIES
INTO NINE DETAILED REQUIREMENTS CATEGORIES**

1. Required by a compliance agreement.
2. Required by a court order or consent decree.
3. Required by a Federal statute or regulation (including permits in place).
4. Required by State statute or regulation (including permits in place).
- 5a. Required by DOE Order -- Environment, Safety & Health
- 5b. Required by DOE Order -- Management & Other
6. Required by agreements-in-principle or agreements with Indian Nations.
7. All other factors (specify).
8. Category unknown, documentation unavailable.
9. Required to meet a proposed compliance agreement (in negotiation, but not yet signed).

- A summary of the regulatory requirements applicable to the site;
- A funding history;
- A description of the DOE/Corps inspection/analytical process;
- A summary of the results of the DOE ADS review;
- A presentation of the results of the DOE Questionnaire, with a comparison to the results of the DOE ADS review;
- A Corps of Engineers presentation of the specific findings on overhead and other costs; and
- A recommended FY 1993 Field Office budget total, adequate to meet all legal requirements, and to fund a prudent level of discretionary activities.

DOE/EPA Review of OMB/Corps Team Findings: After the initial IAG presentations, OMB/Corps team members held separate meetings with DOE and EPA staff and provided them with a more detailed briefing and supporting documentation on the OMB/Corps findings. DOE or EPA personnel provided the OMB/Corps teams with additional information for some of the ADSs and sub-activities. The OMB/Corps teams made adjustments to the requirements classification and cost estimates in all cases where additional supporting documentation on legal requirements and milestones was made available. All follow-up appeals in which such information was presented were included in the level of funding provided in the President's FY 1993 budget.

The last step of the IAG process was a meeting at which all the principals reviewed the information from the initial OMB/Corps briefings as well as all adjustments proposed by DOE or EPA. The IAG approved every proposed adjustment documented by DOE or EPA. The IAG reached a consensus agreement on FY 1993 funding levels that would:

- allow the Federal government to meet all milestones and legal and regulatory requirements included in compliance agreements, consent orders and Federal and State statutes and regulations;
- fully implement all DOE Orders related to Environment, Safety and Health; and
- fund DOE Management Orders and discretionary activities at a prudent level.

Final Results for the FY 1993 Budget

Based on the detailed analysis conducted by the OMB/Corps teams and the DOE ICE Team, the IAG concluded that a FY 1993 funding level for the ERWM Program of \$3,899 million was sufficient to meet all legal requirements and DOE ES&H Orders. In addition, the OMB/Corps teams identified a funding level of \$166 million to meet all legal requirements and DOE ES&H Orders in the DOE Uranium Enrichment account. (The Uranium Enrichment account was not included in the DOE ADS Review.) Including Uranium Enrichment, the total funding to meet legal requirements and DOE ES&H Orders was \$4,065 million for FY 1993. All legally required activities and DOE ES&H Orders were funded at the PPL level or higher, except in cases where ERWM Field Office personnel provided revised funding estimates in response to the DOE questionnaire, or in the case of DOE Headquarters activities.

The final total FY 1993 Budget was developed by adding a prudent level of funding for DOE Management Orders and discretionary activities. The level of discretionary funding generally was set at the level of the official DOE budget request to OMB for most of the ADSs and sub-activities not classified as legally required or required by ES&H Orders.

A slightly different methodology was applied to Headquarters funding. The FY 1993 funding level for Technology Development and Transportation Management was increased by 4 percent over the enacted FY 1992 level, based on a comparative analysis of R&D costs as a percentage of total budgets for ERWM, EPA, U.S. industry and other countries. For Headquarters program management, funding was increased by 6.7 percent over FY 1992 levels, based on an analysis of average personnel costs for the increased FTE levels approved for FY 1993. Subsequent to the completion of the IAG Review progress, ERWM reallocated additional funding to Headquarters in FY 1992. As a result of the increase in the FY 1992 base, the final estimates contained in the President's FY 1993 budget show a smaller percentage increase.

The combination of these categories of funding resulted in a total FY 1993 budget level of \$5.534 billion, a 26 percent increase above FY 1992. Table 7 shows the detailed distribution of the FY 1993 budget, by requirements category and by Field Office. Table 8 displays the total budget for each ERWM Field Office.

The second and third columns of Table 7 show the PPL and DOE request to OMB separated into the three categories used in the DOE ADS Review. The final column shows the results of the IAG Review, in which the DOE questionnaire response assigned individual sub-activities to nine separate requirements categories.

All sub-activities identified in the DOE questionnaire response as legally required or required by DOE ES&H Orders were funded at the PPL level or higher, except in cases where ERWM Field Office personnel provided revised funding estimates in response to the DOE questionnaire, or in the case of DOE Headquarters

Table 7

**The FY 1993 President's Budget Requests \$5,534 Million
for DOE ERWM Activities**

Budget Authority (\$ in millions)

	<u>FY 92</u>	<u>FY 93 PPL</u>	<u>FY 93 DOE Request to OMB</u>	<u>FY 93 Final Total President's Budget</u>
<u>Albuquerque</u>				
Legally Required	---	437.5	379.9	416.5
DOE orders	---	225.1	207.5	--
ES&H Orders	---	--	--	25.2
Management Orders	---	--	--	191.3
All other	---	<u>-9.2</u>	<u>10.4</u>	<u>12.4</u>
	550.5	653.4	597.8	645.3
Civilian	113.7	143.3	123.7	124.2
<u>Chicago</u>				
Legally Required	--	78.1	48.6	46.1
DOE orders	---	12.2	7.7	--
ES&H Orders	---	--	--	32.9
Management Orders	---	--	--	0.4
All other	---	<u>10.0</u>	<u>4.2</u>	<u>5.2</u>
	69.4	100.3	60.5	84.5
Civilian	48.9	96.4	57.7	80.0
<u>Fernald</u>				
Legally Required	---	372.3	276.0 ^{2/}	215.4
DOE orders	---	21.6	18.8	--
ES&H Orders	---	--	--	9.2
Management Orders	---	--	--	61.3
All other	---	<u>13.1</u>	<u>13.1</u>	<u>22.1</u>
	214.2	407.0 ^{1/}	307.9	307.9
Civilian	0.0	0.0	0.0	0.0

^{1/} On September 20, 1992, DOE and EPA signed an amended compliance agreement that revised the scope and schedule for cleanup. As a result of the amended agreement, the ERWM program revised its estimate of required funding to \$307.9 million.

^{2/} Of this amount, \$61.4 million is for DOE Orders. The ERWM budget request did not break out DOE Orders separately, but instead included \$61M for management orders in the category of legally required activities. See Table 6 in Fernald Site Chapter for additional details.

Budget Authority (\$ in millions)

	<u>FY 92</u>	<u>FY 93 PPL</u>	<u>FY 93 DOE Request to OMB</u>	<u>FY 93 Final Total President's Budget</u>
<u>Idaho</u>				
Legally Required	--	517.6	427.3	483.4
DOE orders	--	88.9	82.8	103.6
ES&H Orders	--	--	--	--
Management Orders	--	--	--	--
All other	--	<u>17.1</u>	<u>16.2</u>	<u>17.1</u>
	488.2	623.6	526.2	604.1
Civilian	155.4	164.8	163.9	188.3
<u>Nevada</u>				
Legally Required	--	22.6	16.1	17.6
DOE orders	--	47.2	26.8	--
ES&H Orders	--	--	--	2.6
Management Orders	--	--	--	0.5
All other	--	<u>1.8</u>	<u>1.3</u>	<u>35.2</u>
	45.3	71.6	44.1	55.9
Civilian	0.0	0.0	0.0	0.0
<u>Oak Ridge</u>				
ERWM				
Legally Required	--	712.4	522.2	537.2
DOE orders	--	69.6	53.5	--
ES&H Orders	--	--	--	26.9
Management Orders	--	--	--	82.1
All other	--	<u>27.7</u>	<u>22.8</u>	<u>36.6</u>
Total ERWM	540.1	809.7	598.5	682.8
Civilian	131.1	209.2	182.3	203.9
URE-NE	123.9	NA	173.1	216.9
<u>Richland</u>				
Legally Required	--	820.2	722.5	889.2
DOE orders	--	385.3	327.3	--
ES&H Orders	--	--	--	331.2
Management Orders	--	--	--	65.9
All other	--	<u>66.9</u>	<u>43.2</u>	<u>41.6</u>
	1093.8	1272.4	1093.1	1328.0
Civilian	95.6	8.6	50.8	65.0

Budget Authority (\$ in millions)

	<u>FY 92</u>	<u>FY 93 PPL</u>	<u>FY 93 DOE Request to OMB</u>	<u>FY 93 Final Total President's Budget</u>
<u>Rocky Flats</u>				
Legally Required	--	168.0	142.5	208.9
DOE orders	--	5.0	3.6	--
ES&H Orders	--	--	--	3.6
Management Orders	--	--	--	10.5
All other	--	<u>54.5</u>	<u>22.3</u>	<u>54.5</u>
	183.5	227.5	168.4	277.5
Civilian	0.0	0.0	0.0	0.0
<u>San Francisco</u>				
Legally Required	--	101.2	87.5	95.8
DOE orders	--	0.9	0.3	--
ES&H Orders	--	--	--	8.4
Management Orders	--	--	--	9.3
All other	--	<u>24.0</u>	<u>10.7</u>	<u>5.9</u>
	121.0	126.1	98.4	119.4
Civilian	33.8	26.6	18.0	28.2
<u>Savannah River</u>				
Legally Required	--	531.3	450.1	486.9
DOE orders	--	101.7	84.1	--
ES&H Orders	--	--	--	3.5
Management Orders	--	--	--	118.4
All other	--	<u>17.1</u>	<u>11.3</u>	<u>31.8</u>
	532.1	650.1	545.4	640.7
Civilian	0.2	0.3	0.3	0.3
<u>Headquarters</u>				
Technology	--	464.0	358.5	335.2
Program Mgmt.	--	<u>401.5</u>	<u>297.5</u>	<u>235.4</u>
	445.1	865.5	656.0	570.6
Civilian	23.8	31.0	24.1	17.1
<u>TOTALS</u>				
ERWM				
Civilian	602.5	680.2	620.8	707.0
Defense	<u>3680.7</u>	<u>5126.9</u>	<u>4075.5</u>	<u>4609.7</u>
TOTAL ERWM	4283.2	5807.1	4696.3 ^{3/}	5316.7
URE	<u>123.9</u>	--	<u>173.1</u>	<u>216.9</u>
GRAND TOTAL	4407.1		4869.4	5533.6

^{3/} Excludes \$13.1 million Departmental infrastructure funding unrelated to cleanup. Total Departmental request for ERWM was \$4,709.5 million.

Table 8

FUNDING LEVELS FOR FY 1992 AND FY 1993

AT EACH OF THE DOE FIELD OFFICES

\$ IN MILLIONS

activities. The difference between the Final Total legally required level and the PPL legally required level is due primarily to the reclassification of sub-activities that were identified as required in the DOE ADS Review. Those sub-activities which ERWM Field Office personnel reclassified as discretionary were proposed for funding at the level of the DOE budget request to OMB rather than at the PPL level.

The senior agency representatives to the IAG expressed confidence that the FY 1993 funding level was adequate to meet all legal requirements and milestones, as well as ES&H requirements contained in DOE Orders. The DOE ICE Team legal analysis supported these conclusions. There were three reasons why the results of the OMB/Corps teams' analysis provided a stronger basis for this finding, as compared with the DOE ADS Review.

1. A More Carefully-Developed, Direct Relationship was Established Between Legal Requirements and ADSs: The DOE ADS Review did not provide adequate documentation of the legal requirements for each ADS. The OMB/Corps teams required the ERWM Field Offices to provide specific, detailed legal documentation for each ADS and sub-activity. In addition, the DOE questionnaire responses classified the ADS sub-activities into nine separate categories, whereas the DOE ADS Review classified ADSs into only three, more general categories. The DOE questionnaire response identified numerous instances where ADSs were misclassified in the DOE ADS Review.
2. A More Detailed Review and Classification was made of Sub-activities Within ADSs: Many ADSs include separate sub-activities. The DOE ADS Review classified an entire ADS as legally required if the majority of funding within the ADS was legally required. The OMB/Corps teams required the ERWM Field Offices to provide detailed information on legal requirements and funding for each sub-activity within an ADS, permitting a more detailed analysis of legal requirements.
3. The OMB/Corps Teams Conducted Intensive On-site Reviews and Consulted with EPA and the States: The DOE ADS Review was conducted at DOE Headquarters by Headquarters personnel. Although ERWM Field Office personnel may have been consulted by phone, site visits were not made to validate information. In addition, Headquarters personnel did not consult with EPA or State officials on legal requirements as part of the ADS review. The IAG Review Process included in-depth site visits by OMB/Corps teams to validate all information received from the Field Office officials. In addition, the OMB/Corps teams consulted separately with EPA Headquarters and Regional Office personnel and State officials, to ensure that the teams had a complete understanding of legal and regulatory requirements and milestones.

The funding levels in the President's FY 1993 Budget, resulting from this analysis, incorporated the direct program and indirect cost estimates provided by DOE. The FY 1993 budget did not reflect any reductions in potentially excessive program, overhead and contingency costs at the Field Offices, except in cases where DOE Field Office personnel provided revised estimates. While the IAG process found numerous instances of widespread problems in the ERWM cost estimates, it also was concluded that DOE needs additional time to put in place new cost controls. The specific IAG findings on these issues are discussed in the following sections.

III. FINDINGS AND OBSERVATIONS ON COST ESTIMATION AND MANAGEMENT ISSUES

This section discusses the principal findings and additional observations regarding cost and management issues. These findings and observations were common to all or many of the ERWM sites, as well as Headquarters program management.

FINDINGS ON COST ESTIMATION ISSUES

FINDING #1. ERWM DIRECT PROGRAM COSTS WERE SUBSTANTIALLY OVER-ESTIMATED FOR A SIGNIFICANT NUMBER OF ADSs REVIEWED.

The OMB/Corps teams' analysis of a sample of 236 ADSs, approximately 12 percent of the total number, revealed that the cost estimates contained in a significant number of the ADSs were over-estimated or excessive. The Corps of Engineers cost estimation experts identified the following examples of over-estimated costs at the Field Offices, and presented them to the Interagency Group:

- **Albuquerque:**
 - At Los Alamos, design and construction of a hazardous waste treatment facility was estimated at \$185/square foot for one structure and \$310/square foot for a second structure. A mixed waste receiving and storage facility was estimated at \$436/square foot; an incinerator ash solidification building was estimated at \$363/square foot. If these structures were priced according to the Los Alamos "Cost Estimating Guidelines," estimates would be reduced by \$8.8 million.
 - Los Alamos Environmental Restoration personnel cost assumption of \$220,000 per full time equivalent (FTE) appeared excessive. If the \$100,000/FTE estimate used by the Corps in comparable projects were applied, FY 1993 estimates would be reduced by \$5.5 million.
 - For remediation of the Rifle UMTRA site, contractor's profit was added to the construction cost at a rate of 10 percent for a \$46 million job. A more reasonable profit margin would be 6 percent. The management and engineering costs were estimated to be \$25 million, slightly more than 50 percent of construction. A more reasonable number would be 25 percent. Use of more reasonable factors would result in a reduction of \$13.3 million.
- **Oak Ridge:**
 - For remediation of 39 tanks at Oak Ridge, the cost estimate assumes three contingency levels: a contingency of 20 percent

during the assessment phase; a contingency of 25 percent for remediation of nine tanks; and a contingency of 40 percent for remediation of 30 tanks. The unit cost estimates did not consider economies of scale and the "learning curve" experience gained as the tanks are remediated, which are standard engineering practices.

- At the Oak Ridge Reservation, DOE plans to construct impermeable shields, known as RCRA caps, at 21 separate areas. The cost estimates applied the same cost rates for all 21 caps, with no economy of scale or adjustment for increased efficiency as experience is gained with the caps, which should be applied under standard engineering practices.
- Construction of a haul road was estimated at about \$1,800/lineal foot. Based on Corps costs for comparable projects, the haul road was over-estimated by \$5 million.
- Construction of three impermeable barriers (RCRA caps), totaling less than one acre, was estimated at \$3 million. Based on Corps costs for construction of RCRA caps, this was overestimated by approximately \$2.5 million.

● Fernald:

- DOE has estimated contractor transportation costs for 405 trips totaling \$331,750. Based on an analysis of the average air fare to nine major metropolitan areas, this transportation cost was overestimated by \$170,000, or over 50 percent.
- DOE has estimated 25 Computer Aided Drafting Design (CADD) stations at \$45,000 each for a total of \$1,125,000. A top brand name CADD can be purchased for \$18,000. Thus costs are potentially overestimated by \$675,000.
- DOE has approved 53,333 square feet of office space for approximately 258 Architect-Engineer employees or 207 square foot (sf) per employee. A reasonable standard for a location like Fernald is 153 sf/employee based on advice from the General Services Administration regulations. The costs thus are excessive by \$208,980.
- Procurement of temporary trailer office space was estimated to cost \$160.36/sf at the Fernald site. The analysis disclosed that permanent quality office space built in the Washington Metropolitan area would cost \$128.00/sf and a temporary trailer Health Care Facility at McConnell AFB, Kansas cost \$94.38/sf. The trailer cost is exorbitant.

- **Richland:**

- For installation of RCRA groundwater monitoring wells, the Hanford cost exceeded the cost of comparable Corps projects by \$49,000/well. For the 47 wells in the FY 1993 budget request, the difference totals \$2.3 million.

The DOE ICE Team found both overstated and understated costs. In fact, the DOE ICE Team estimate was within 10 percent of the ADS estimate only 16 percent of the time. Based on this analysis, the IAG review concluded that the quality of the ERWM cost estimates should be improved substantially. The IAG concluded that additional cost estimating guidelines should be implemented in FY 1993, or sooner if possible, but that no specific savings estimate should be adopted at this time. As a result, no adjustments were made in the FY 1993 funding level. To the extent that savings can be effected by the ERWM program, without jeopardizing the achievement of legal requirements, then additional funds can be made available for other program activities.

FINDING #2. ALL FIELD OFFICES RESPONSIBLE FOR ERWM ACTIVITIES HAD VERY HIGH OVERHEAD COSTS.

Based on separate analyses by the OMB/Corps teams and the DOE Independent Cost Estimating (ICE) Team, the IAG found very high overhead costs at all DOE Field Offices responsible for managing ERWM program activities. An analysis led by the Corps of Engineers of 55 project ADSs (about 20 percent of the ERWM program) showed that overhead costs were \$243 million, or 139 percent, higher than comparable overhead costs for similar Corps activities. The DOE ICE Team analysis of 1,594 ADSs revealed total overhead costs of \$1,347 million, and recommended that the estimates be reduced by \$350 million, or 25 percent. The Corps and the DOE ICE Team analyses employed different methodologies, which are discussed in more detail below.

OMB/Corps Analysis: The Corps of Engineers cost estimators, assisted in part by OMB staff, conducted an in-depth review of 55 project ADSs. The ADSs included large construction projects, environmental restoration assessments, and typical waste management activities.

Estimates of direct project costs and total overhead costs were derived for comparison with Corps projects, by adjusting the ADS costs as follows:

- direct project costs were assumed at most sites to be those stated by DOE;
- amounts for contingencies and escalation were deleted, since they would be analyzed separately;

- amounts for base services, Headquarters program direction and support were subtracted from project costs to permit a consistent comparison with similar overhead costs for Corps projects; and
- a proportionate amount of program-wide ADS costs was added to the project overhead costs, since these costs should be appropriately charged to the project.

The resulting estimate of overhead costs consisted of three categories of costs: project management, program direction/contractor oversight, and contractor overhead. Using this methodology, the total cost for a given project, and the amount of the cost that was spent on the three categories of overhead were derived. Standard Corps costs estimating procedures were used to determine overhead costs as if the activity were a typical project managed by the Corps.

The results of the analysis, for each Field Office, are shown in Table 9. The average overhead rate (overhead costs as a percent of direct costs) for all Field Offices responsible for managing ERWM activities was 101 percent, more than twice the overhead rate for comparable Corps of Engineers activities. The analysis showed that potential savings of \$243 million would be possible at the lower overhead rate. The analysis covered about 20 percent of the total ERWM program, so that the potential savings from lower overhead costs across the entire ERWM program could be substantially greater. Further details of the overhead cost analysis are contained in the Army Corps of Engineers supplemental report on cost estimates.

DOE ICE Team Analysis: The ICE Team analysis also concluded that overhead costs were very high. The ICE Team's methodology was different from the OMB/Corps study approach, so that the results of the two efforts cannot be compared directly. However, even though the analytical approaches were different, the conclusions were similar.

The ICE Team analysis of overhead costs was based on information provided by the DOE Controller on actual site overhead cost rates for subcontracts, labor and material. These estimates were applied to ADS estimates by site. The ICE Team analysis, as presented to the IAG, showed a total of \$1,347 million in overhead costs, representing an overhead rate of 40.1 percent. The distribution of ICE Team estimates of overhead costs by site is shown in Table 10.

The ICE Team concluded that:

- The allocation of Field Office overhead costs to the ERWM Program may be too high and can be cut substantially;
- Overhead costs at various sites are not consistent with ERWM activity levels; and

Table 9

**ESTIMATED OVERHEAD COSTS FOR DOE FIELD OFFICES RESPONSIBLE FOR
MANAGING ERWM PROGRAM ACTIVITIES WERE MORE THAN DOUBLE THE LEVEL FOR
COMPARABLE ARMY CORPS OF ENGINEERS ACTIVITIES**

(\$ in millions)

<u>Field Office</u>	<u>Number of ADSs Reviewed</u>	<u>Estimate of DOE Overhead Costs</u>	<u>Overhead Re-Estimate</u>	<u>Difference</u>
Albuquerque	10	\$ 69M	\$18M	\$51M
Chicago	2	10	5	5
Fernald 1/	NA	NA	NA	NA
Idaho	5	46	26	20
Nevada	3	11	6	5
Oak Ridge	3	15	6	9
Richland 1/	NA	NA	NA	NA
Rocky Flats	1	2	1	1
San Francisco	2	6	5	1
Savannah River	29	258	107	151
Total	55	\$417M	\$174M	\$243M 2/
Average Overhead Rate	--	101%	42%	--

Notes:

1. The analysis of overhead costs for Fernald and Richland was handled differently, and is discussed in the section on Field Office Summaries.
2. Totals may not add due to rounding.

Table 10

THE DOE ICE TEAM FOUND HIGH FIELD OFFICE COSTS, WITH A WIDE VARIATION AMONG THE FIELD OFFICES.

<u>Field Office</u>	<u>Base Cost 1/</u>	<u>ICE Estimates</u>	
		<u>Overhead Cost 2/</u>	<u>Overhead Rate 2/</u>
Albuquerque	\$551M	\$128M	23%
Chicago	76	36	47%
Fernald ^{3/}	299	17	6%
Idaho	436	146	33%
Nevada	62	14	23%
Oak Ridge	542	182	34%
Rocky Flats	144	151	105%
Richland	834	492	59%
San Francisco	91	39	43%
Savannah River	320	142	44%
Field Sub-Total	3,355M	1,347M	40%
HQ-Program Management	278		
HQ-Tech Dev.	240		
Total	3,873	1,347	34.8%
<u>Potential Reductions</u>			
Reduce Overhead by 25%	--	\$350M	--
Source: DOE ICE Team			

Notes:

1. Base costs represent the ICE Team estimates of direct program costs prior to consideration of overhead, contingencies and escalation.
2. Overhead rates shown are general composites of site labor, material and overhead rates obtained from the Field Offices.
3. The only overhead cost included for Fernald in the ICE Team analysis was the M&O contractor fee. The OMB/Corps analysis covered the full range of overhead costs.

- Overhead costs can be reduced through increased emphasis on subcontracting, task order contracting, and direct charging of some current overhead functions.

The ICE team analysis recommended that the FY 1993 overhead cost estimates be reduced by 25 percent, saving \$350 million.

Comparison of OMB/Corps and ICE Team Findings: Although the OMB/Corps and ICE team findings are similar, the actual savings estimates are not directly comparable for several reasons:

- (1) The Corps overhead analysis is based on a sample of 55 project ADSs, about 20 percent of the ERWM program; the ICE team analysis extended to 1,594 ADSs, based on sitewide overhead cost data from the DOE Controller.
- (2) The OMB/Corps and the ICE Teams used different definitions of overhead costs. The OMB/Corps' definition was broader, following the guidance in the September 26, 1991, letter from OMB Associate Director Robert E. Grady to Assistant Secretary of the Army Nancy P. Dorn. The ICE Team utilized composite project FY 1993 overhead costs provided by the DOE Field Offices for subcontractors, labor and material to compile its estimate.
- (3) The OMB/Corps' analysis used both the PPL funding level and the ERWM Unvalidated Field Estimates, in cases where detailed back-up data for the PPL funding level was not available. The ICE Team analysis was based on the ERWM Unvalidated Field Estimates.
- (4) The OMB/Corps' estimate of potential savings was based on potential savings relative to standard Corps of Engineers practices. The ICE team savings estimate represented a potential target level that could be achieved within DOE.

IAG Conclusion: Notwithstanding the methodological differences between the two analyses, the conclusions regarding very high overhead costs were clear, compelling and consistent. DOE noted that the level of overhead costs was set by DOE management and operating contractor policies and accounting structures, and was not under the direct control of the ERWM program. For example, at multi-program Field Offices (e.g., Albuquerque, Oak Ridge) total overhead costs are allocated to the ERWM program. At other Field Offices solely under ERWM responsibility (e.g., Fernald), the ERWM Program has greater control over overhead rates. The Department indicated that it would need to conduct a follow-up study of overhead costs to better understand the differences between the OMB/Corps and ICE Team findings, and to determine the specific changes necessary in Department-wide practices.

Based on the OMB/Corps and ICE Team analyses, the IAG concluded that significant savings in overhead rates could be achieved in the ERWM program.

However, because of the issues raised by DOE, it would not be possible to establish a specific target level for overhead cost savings in FY 1993 until the follow-up DOE analysis was completed. However, the IAG believed that DOE should act quickly and aggressively to contain overhead costs, and that new overhead cost controls should be implemented as quickly as possible.

FINDING #3. CONTINGENCY COSTS FOR MANY ERWM ACTIVITIES WERE FOUND TO BE VERY HIGH AND IN MANY INSTANCES THEY WERE UNDOCUMENTED.

Cost estimates for projects normally contain a contingency estimate to account for unexpected circumstances. In most industry and government projects, contingencies comprise between 5 and 15 percent of total costs. In special cases, such as unique activities or ones with large technical risk, contingency factors can be higher. For example, NASA may use higher contingencies for large, high risk, first-of-a-kind space projects. Contingency cost estimates for the ERWM program were analyzed in detail by both the OMB/Corps teams and the DOE ICE Team and are discussed below.

OMB/Corps Analysis: The cost analysis of 236 ADSs included many instances where the documentation for contingency was not available, making comparisons to Corps projects difficult. For the subsample of 55 ADSs used for the quantitative cost comparisons, total DOE contingencies were found to be \$24 million, or 35 percent, higher than for comparable Corps projects. A summary of the results of the contingency cost analysis for all Field Offices is shown in Table 11. Included in the sample were the following:

- A \$16 million discrepancy for one ADS involving construction of tanks at Idaho. The difference represents a difference in judgement regarding appropriate contingency rates (20 percent versus 15 percent) between DOE and the Corps.
- A \$346 thousand difference for construction of a new sanitary landfill at Rocky Flats. DOE used "standard rates" from its cost estimating guidelines. Corps cost engineers believed this was too high for this type of construction.
- A \$849 thousand difference for sewer pipe rehabilitation at Lawrence Livermore National Laboratory. Corps cost engineers believed that the DOE "standard rates" were inappropriately high for this type of construction.

DOE ICE Team Analysis: The ICE Team analysis, as presented to the IAG, calculated contingency costs which should be applied to the ERWM program. A summary of the ICE Team findings is presented in Table 12. The ICE Team analysis was conducted at the ADS level, and extended to 1594 ADSs. The ICE Team analysis determined that a total of \$465M in contingency was suitable for the FY 1993 program.

Table 11

THE OMB/CORPS ANALYSIS REVEALED EXCESSIVE CONTINGENCY COSTS.

(\$ Millions)				
<u>Field Office</u>	<u>Number of ADSs</u>	<u>ERWM Contingency Cost</u>	<u>Contingency Re-Estimate</u>	<u>Difference</u>
Albuquerque	10	\$15M	\$15M	\$ 0M
Chicago	2	2	1	1
Fernald ¹ /	NA	NA	NA	0
Idaho	5	28	10	18
Nevada	3	6	2	4
Oak Ridge	3	10	8	2
Richland ² /	NA	NA	NA	0
Rocky Flats	1	1	0.4	1
San Francisco	2	3	2	1
Savannah River	<u>29</u>	<u>28</u>	<u>28</u>	<u>0</u>
Field-Total ³ /	55	\$ 92M	\$ 68M	\$24M

Notes:

1. For Fernald, ten ADSs were reviewed for contingency costs, but only two ADSs addressed contingency in the estimate. One (ADS 52-B2; remedial support facility) mentioned contingency costs but apparently did not apply any; and another (ADS 4-B1; RI/FS) applied a 20 percent contingency to contractor design hours and zero for all other activities. Since documentation was inadequate for these two ADSs and unavailable on the other eight, it was not possible to determine if contingencies were properly applied.
2. For Richland, 27 ADSs were reviewed for contingency costs, but only 2 included contingency. Without documentation identifying contingencies in 25 ADSs and inadequate documentation for the other 2, it was not possible to determine if contingencies were properly applied.
3. Totals may not add due to rounding.

Table 12

THE DOE ICE TEAM RECOMMENDED \$450 MILLION IN ERWM CONTINGENCY COST SAVINGS.

\$ Millions			
<u>Field Office</u>	<u>Base and Overhead¹/ Costs</u>	<u>Contingency Costs</u>	<u>Contingency Rate</u>
Albuquerque	\$679M	\$110M	16%
Chicago	112	25	22%
Fernald	316	73	23%
Idaho	582	101	17%
Nevada	76	15	20%
Oak Ridge	724	155	21%
Rocky Flats	295	50	17%
Richland	1,326	254	19%
San Francisco	130	28	22%
Savannah River	462	89	19%
Field Sub-Total	\$4,702M	\$900M	19%
HQ-Program Mgmt	278	15	5%
HQ-Tech Dev	240	0	0%
Total	\$5,220M	\$915M	18%
<u>ICE Recommendation</u>			
Field Offices	\$4,702M	\$450M	10%
HQ-Prog Mgt	278	15	5%
HQ-Tech. Dev.	240	0	0%
Total	\$5,220M	\$465M	9%
Adjustments	--	\$450M	--
Source: DOE ICE Team			

Notes:

1. Base and overhead costs are ICE Team estimates of the direct program and overhead costs.

The ICE Team recommended that the FY 1993 contingency rate should, on average, be reduced to 10 percent, saving \$450 million relative to the baseline contingency cost estimate. The ICE Team concluded that a lower contingency level is appropriate for FY 1993, as compared to the Five-Year (FY 1993-1997) time period, because the integration of individual ADSs into a total program will require a lower level of contingency. The ICE Team analysis also noted that potential contingency cost savings may result from more innovative contracting, more cost effective design solutions and other cost saving measures.

IAG Conclusion: The IAG concurred in the analysis of potentially excessive contingency costs made by both the OMB/Corps and ICE Teams. It appeared that contingency costs could be reduced in a number of instances without increased risk to project schedules. The IAG did not set a specific savings target for FY 1993 but strongly urged DOE to review the findings of the OMB/Corps and the ICE Teams and make necessary adjustments.

ADDITIONAL OBSERVATIONS

In addition to the principal findings discussed earlier, the OMB/Corps teams identified several other problems and issues, outside the original planned scope of the study. These are discussed below.

OBSERVATION #1. THE ERWM PROGRAM DID NOT APPEAR TO RIGOROUSLY MANAGE BUDGET EXECUTION IN FY 1992 TO ENSURE COMPLIANCE WITH REQUIRED MILESTONES.

The OMB/Corps teams observed that DOE internal procedures for the allotment of funds in FY 1992 may not be adequate to ensure full compliance with legal requirements, even though the President's budget proposed the full amount requested by DOE, Congress fully funded the necessary appropriations, and OMB fully apportioned all available funding consistent with DOE requests.

In making its site-by-site allocations for FY 1992, ERWM Headquarters reserved from 5-15 percent of site funds for contingencies. An August 8, 1991, memorandum from ERWM Headquarters to the Oak Ridge, Chicago, Savannah River, and Fernald Offices stated that 15 percent of FY 1992 appropriated funds would be reserved, of which 5 percent would be placed in Headquarters "reserve accounts." Following this action, ERWM Headquarters re-allocated the remaining funding among Field Offices in a different proportion than assumed in the budget request submitted to Congress. As a result, some Field Offices may have insufficient funds to meet legally required milestones. For example, the OMB/Corps teams observed that:

- **Rocky Flats:** The ERWM allocation is \$17.5 million less than the Field Office believes is needed to meet legal requirements in FY 1992 under the Rocky Flats Interagency Agreement. The Field Office advises that this action also would jeopardize the achievement of up to 48 milestones in

1993-94. Despite this shortfall, DOE Headquarters has reserved \$2 million from Rocky Flats as part of its Headquarters contingency reserve.

- **Los Alamos:** DOE Headquarters reserved/reprioritized \$21 million from the FY 1992 Los Alamos allotment. The Albuquerque Field Office reserved an additional \$6 million. As a result, Los Alamos site personnel believed that the site could fall out of compliance with the RCRA/HSWA permit due to inadequate funds.

The need for better controls over budget execution was further emphasized by the fact that FY 1992 Field Office funding estimates were changing throughout the period of this review, with inadequate documentation to permit an understanding of the full magnitude and rationale for the changes. One of the difficulties encountered by the OMB/Corps review teams in conducting this study was the lack of firm data for FY 1992. FY 1992 funding estimates received from the Field Offices differed from those received from DOE Headquarters. Furthermore, Field Office funding estimates received from Headquarters changed as the FY 1992 budget execution plan continued to change over the course of the study.

The IAG concluded that additional measures were needed to increase accountability for program and budget execution, and in particular, ensure that funds are allocated and actually spent as represented in the formulation of the budget. Further, Field Offices should be informed of the amounts requested in the budget for each project to enable them to plan for the operating year.

OBSERVATION #2. THE DOE AND ERWM FIELD OFFICES HAD INSUFFICIENT GOVERNMENT PERSONNEL WITH THE SKILLS NECESSARY TO INDEPENDENTLY PREPARE AND REVIEW COST ESTIMATES AND BUDGET REQUESTS, AND TO EFFECTIVELY OVERSEE CONTRACTORS.

The staffing level of ERWM program has increased two-and-one-half times (from 373 FTE to 936 FTE) in the two years from FY 1989 to FY 1991. Notwithstanding this sharp increase in personnel levels, the OMB/Corps teams observed that a number of the Field Offices are not adequately staffed with DOE personnel with the skills necessary to budget effectively for the program and oversee contractors. For example:

- At Fernald, a DOE staff of less than 30 was assigned responsibility to oversee about 1,500 contractor employees with a rapidly growing budget and clean-up program; and
- "Independent" contractors selected by DOE contractors, rather than DOE staff, prepared technical and cost reviews of the ADSs. It appeared that ADSs containing questionable scopes of work and costs were forwarded without comment or revision to ERWM Headquarters for inclusion in the ERWM Five-Year Plan.

The IAG concluded that the ERWM program had insufficient staff with the necessary skills to manage effectively the rapid increase in program responsibilities and funding. The principal concern was an apparent lack of needed staff skills at the ERWM Field Offices to establish an independent cost estimation capability and to oversee contractor work in more detail. Concern also was expressed about the distribution of total ERWM staff between Headquarters and Field Offices.

Overall ERWM Staffing Level: The President's FY 1993 budget provided the ERWM program with a new FTE level of 1,598, an increase of 662 FTEs, or 71 percent, above the FY 1991 level. In addition, it is assumed that the Department will undertake an aggressive hiring effort in FY 1992, to acquire these additional staff as rapidly as possible. As a result, the budget also provided a revised FY 1992 FTE level of 1,551 FTE, an increase of 415 FTE, or 37 percent above the level enacted in the FY 1992 appropriation. These changes are shown in Table 13.

Distribution of ERWM Staff by Field Office: The OMB/Corps review teams observed a lack of staff with adequate capability to oversee contractors at a number of ERWM Field Offices. This problem was not observed in the review of Headquarters activities. However, in allocating the FTE increase provided in the FY 1993 budget, the ERWM program proposed to allocate 238 FTE (or 36 percent of the total 662 FTE increase) to Headquarters, while providing an increase of only 424 FTE to the ERWM Field Offices. This proposed allocation appears to concentrate personnel resources unnecessarily at the Headquarters level. Moreover, the proposed allocation would continue large variations in staffing among the Field Offices, as measured by the amount of program funding per FTE, shown in detail in Table 14. The ratio of program funding per FTE is only one indicator that could be used to gauge the adequacy of FTE levels. It also is an imperfect measure, since the actual scope of functions performed at each Field Office may vary; for example, the FTE levels at Idaho and Richland include site "landlord" activities unrelated to cleanup. A more detailed workload analysis would be required to reach a definitive conclusion on the adequacy of staffing levels. However, the ERWM program did not provide a workload analysis that would enable a more thorough assessment. Consequently, the IAG did not have an opportunity to review this issue in depth, and did not reach a final conclusion on the ERWM proposed distribution of FTEs. This is an area where further review may be needed.

Cost Estimating Capability of ERWM Staff: The OMB/Corps teams observed a particular lack of staff capability at the Field Offices in the area of independent cost estimation. The problems of excessive direct program and overhead costs may have been the result, in part, of a lack of staff with adequate cost estimating skills needed to develop Government cost estimates and to review contractor prepared technical and cost documents.

In the FY 1993 budget review process, the ERWM program developed and presented to OMB an internal hiring plan for an additional 707 FTEs in FY 1992, with additional new hires in FY 1993. The FY 1992 plan included only 58 proposed new

Table 13

Table 14

ERWM'S PROPOSED FTE ALLOCATION PROVIDES A DISPROPORTIONATE SHARE TO HEADQUARTERS, AND RESULTS IN A WIDE VARIATION AMONG FIELD OFFICES

	FY 1991 Actual		FY 1993 President's Budget	
	FTE	\$M/FTE	FTE	\$M/FTE
Headquarters 1/	227	1.8	465	1.2
<u>Field Offices</u>				
Albuquerque	78	5.4	97	6.7
Chicago	5	12.8	29	2.9
Fernald 3/	N.A.	N.A.	69	4.5
Idaho 2/	191	2.2	230	2.6
Nevada	25	0.9	27	2.1
Oak Ridge	30	12.2	97	7.0
Rocky Flats	25	6.5	35	7.9
Richland 2/	284	2.8	421	3.2
San Francisco	9	6.5	39	3.1
Savannah River	62	9.7	89	7.2
Field-Total	709	4.5	1,133	4.2
Total	936	3.8	1,598	3.3
Headquarters Percentage of Total	24%	--	29%	--

Notes:

1. The Headquarters estimates include Technology Development and Headquarters Program Direction.
2. The Idaho and Richland figures include FTEs associated with site-wide "landlord" activities unrelated to clean-up, resulting in a lower ratio of \$M/FTE; the others do not include landlord activities.
3. No Fernald site FTE information is available for FY 1991 because staffing was included under Oak Ridge at that time.

Table 14

ERWM'S PROPOSED FTE ALLOCATION PROVIDES A DISPROPORTIONATE SHARE TO HEADQUARTERS, AND RESULTS IN A WIDE VARIATION AMONG FIELD OFFICES

	FY 1991 Actual		FY 1993 President's Budget	
	FTE	\$M/FTE	FTE	\$M/FTE
Headquarters 1/	227	1.8	465	1.2
<u>Field Offices</u>				
Albuquerque	78	5.4	97	6.7
Chicago	5	12.8	29	2.9
Fernald 3/	N.A.	N.A.	69	4.5
Idaho 2/	191	2.2	230	2.6
Nevada	25	0.9	27	2.1
Oak Ridge	30	12.2	97	7.0
Rocky Flats	25	6.5	35	7.9
Richland 2/	284	2.8	421	3.2
San Francisco	9	6.5	39	3.1
Savannah River	62	9.7	89	7.2
Field-Total	709	4.5	1,133	4.2
Total	936	3.8	1,598	3.3
Headquarters Percentage of Total	24%	--	29%	--

Notes:

1. The Headquarters estimates include Technology Development and Headquarters Program Direction.
2. The Idaho and Richland figures include FTEs associated with site-wide "landlord" activities unrelated to clean-up, resulting in a lower ratio of \$M/FTE; the others do not include landlord activities.
3. No Fernald site FTE information is available for FY 1991 because staffing was included under Oak Ridge at that time.

Table 15

THE ERWM PROPOSED STAFFING PLAN DOES NOT PROVIDE FOR A SUFFICIENT NUMBER OF NEW STAFF WITH NEEDED SKILLS IN COST ESTIMATING AND CONTROL.

<u>Category of Personnel Skills</u>	<u>ERWM Hiring Plan</u>	
	<u>Proposed New Hires</u>	<u>Percentage of Total</u>
Cost Estimation, Accounting Budget and Business Management	58	8%
Engineering and Scientists	564	80%
Personnel Management, Legal and other Specialists	24	3%
Administrative Support	<u>61</u>	<u>9%</u>
Total	707	100%

Note: These figures were contained in a proposed FY 1992 ERWM hiring plan submitted to OMB in the Fall of 1991. ERWM also submitted a proposed FY 1993 hiring plan that shows a similar distribution of personnel skills. The proposed total of 707 FTE was developed prior to the final decision in the FY 1993 budget to increase ERWM staffing by 662 FTEs.

Table 16

THE ERWM PROGRAM HAS LARGE AND INCREASING FUND BALANCES FROM PRIOR YEAR APPROPRIATIONS.

(\$ millions)			
<u>ERWM Total Reported by The DOE Budget Office</u>	<u>Beginning Of FY 1991</u>	<u>Beginning Of FY 1992</u>	<u>Percent Increase</u>
Unobligated Balance	\$ 63.9M	\$ 112.2M	76%
Obligated, But Uncosted Balances	\$818.3M	\$1,620.0M ^{1/}	98%
<u>Uncosted Balances Reported By ERWM Field Offices in Response to Questionnaire 2/</u>			
<u>Field Office</u>			
Albuquerque	NA	\$ 26.4M	
Chicago	NA	41.0	
Fernald	NA	NA	
Idaho	NA	173.5	
Nevada	NA	8.8	
Oak Ridge	NA	137.2	
Richland	NA	NA	
Rocky Flats	NA	54.2	
San Francisco	NA	110.3	
Savannah River	NA	68.9	
Washington, DC Headquarters	NA	39.5	
Total		\$ 659.8M	

Note:

- Balance may be abnormally high due to FY 1991 supplemental appropriation of \$340 million enacted April 10, 1991, halfway into FY 1991. Excluding the supplemental, the uncosted balance is \$1,280.0 million, an increase of 56 percent above the level at the beginning of FY 1991.
- These numbers are as reported in the questionnaire. They are not necessarily consistent with the official DOE accounting system.

ERWM officials noted that the uncosted balances at the beginning of FY 1992 were abnormally high because the program received a \$340 million supplemental appropriation on April 10, 1991, halfway through the fiscal year. Excluding the supplemental appropriation, the uncosted balances increased by 56 percent over the level at the beginning of FY 1991.

Because of the large discrepancy between the ERWM Field Offices and the DOE Budget Office in the reporting of data on unobligated and uncosted balances, it is not clear whether effective budget and management controls are in place. At the completion of the IAG process, the OMB requested that DOE conduct a detailed review of all fund balances as quickly as possible.

OBSERVATION #4. THE ERWM PROGRESS TRACKING SYSTEM (PTS) DID NOT EFFECTIVELY TRACK FUNDING LEVELS TO LEGAL REQUIREMENTS OR MEASURE ACCOMPLISHMENTS AGAINST EXPENDITURES.

Last year, OMB requested that the Department develop and implement a Progress Tracking System (PTS) to improve the measurement of progress in the program. A February 28, 1991, letter from former OMB Deputy Director William Diefenderfer to Admiral Watkins stated:

As part of the seven-point plan, DOE should implement an adequate program planning, control, and evaluation system for use by agency managers and EXOP officials to assure that the program is managed and funded efficiently and effectively. The overall approach should contain the following parts:...

- Program/Project tracking and evaluation of program performance. The program/project tracking system should be at the same program/project level of detail as the system for setting priorities. For each program/project the system should allow DOE to track progress, including quantitative and qualitative outputs vs. time, progress vs. expenditures and expenditures vs. time. This system would be used to determine how well the programs/projects that are selected and funded are implemented to reduce risk.

This overall system should be implemented in consultation with OMB by September, 1991 for use in preparing the FY 1993 budget..

All activity data sheets should be submitted with the FY 1993 request in a form that permits tracking projects and measuring accomplishments.

The Department utilized the ADSs as the building block for the PTS. The PTS was implemented on October 1, 1991, but is not yet fully operational. As of the period of the IAG review (October through December 1991), the necessary software for the PTS was developed, but the data was not yet entered in the system. As a result, the PTS could not generate reports that would have been useful in the IAG review. The ERWM program claims that this situation is now changing, and that the PTS should be fully operational by the beginning of FY 1993. In their review of ADSs and sub-activities, the OMB/Corps teams observed inadequacies in the structure of the ADSs

that likely would preclude the achievement of the goals established for the PTS. These problems include:

- **Lack of direct linkage between legal requirements and ADSs:** The OMB/Corps teams observed many cases where the legal requirements for an ADS were not clearly documented, or where a legal requirement applied to only one sub-activity within an ADS. Without a more direct linkage, it will be very difficult in the future to ensure that all legal requirements are in fact being implemented through specific ADSs and sub-activities.
- **Linking expenditures to milestones:** When the PTS is linked with the DOE Financial Information System, it will record whether funds have been spent at the ADS level. However, the system cannot match the actual expenditures against individual milestones. Therefore, it will not be possible to determine easily whether the milestones to be achieved for a certain funding level were in fact achieved.

In recognition of these problems, the Department has initiated an effort to reorganize the ADSs so that they will reflect a more logical work breakdown structure and to better document legal requirements associated with individual ADSs. This effort will help improve the utility of the ADSs. However, the IAG concluded that further efforts will be needed to link legal requirements to ADSs, and subactivities within ADS, and to measure actual clean-up progress at the ADS level.

OBSERVATION #5. SOME ERWM FIELD OFFICES MAY HAVE PREMATURELY INITIATED WORK ON SPECIFIC CLEAN-UP MEASURES, WELL IN ADVANCE OF THE COMPLETION OF THE RI/FS PROCESS.

The process for cleaning up Superfund sites (i.e., those sites subject to EPA jurisdiction under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)) begins with a Remedial Investigation/Feasibility Study (RI/FS), leading to a Record of Decision (ROD) that explains why a specific remedy is chosen, followed by actual implementation of clean-up measures. The RI/FS is intended to define the scope of the problem, the alternative remedies for clean-up and the costs and risks associated with these alternatives. The level of clean-up is determined by reference to Applicable or Relevant and Appropriate Requirements (ARARs), which are site-specific cleanup standards agreed upon between the EPA Regional Office and State agency personnel. The cleanup level and selection of a specific remedy is approved by EPA in the ROD.

Most ERWM CERCLA clean-up projects are in the RI/FS stage, so that a selection of a clean-up remedy has not yet occurred (except for Interim Removal Actions necessary to address immediate health or environmental risks). Even so, the OMB/Corps teams observed a number of instances where DOE was requesting funding for engineering, design or construction of pilot plants, or other implementation work

in support of a particular clean-up remedy, in parallel with the RI/FS, and well in advance of the completion of the RI/FS phase and the ROD. For example, at Fernald, funds were requested in FY 1993 for engineering work for two ADSs where the RODs are scheduled for December 1994 and May 1997.

In some cases, ERWM Field Office personnel indicated that clean-up work was being initiated early because of the need to meet their interpretation of Section 120(e) of CERCLA, which requires that "substantial continuous physical onsite" remedial work be underway at the site within 15 months of the completion of the RI/FS. Undertaking the engineering design of specific clean-up remedies in parallel with the RI/FS process, and well in advance of a ROD, can be risky because the RI/FS can result in the selection of a clean-up remedy that is different from the one the site has been designing or pilot testing. In some cases, this design and engineering work is being undertaken years before the ROD. It not only potentially undermines the purpose of the RI/FS but also could result in large unnecessary expenditures. The Department of Justice and EPA are reviewing this matter in detail and will develop policy guidance through an appropriate interagency process.

A principal factor affecting the analysis and selection of clean-up alternatives is the assumption regarding future use of the site. These assumptions can have a substantial impact on the costs and benefits of clean-up. For example, it may be possible to meet all environmental standards at a site through containment of the waste on-site, by assuming that strict institutional controls can be maintained effectively over the long periods the wastes will remain hazardous. However, if the site is assumed to be available sooner for unrestricted use, then the waste must be either completely destroyed or removed entirely from the site, at substantially greater cost. No official policies on future use of ERWM sites have been established by DOE, and no official positions have been taken by EPA. However, the cleanup planning process requires the Field Offices to make specific assumptions about future site use.

The ERWM program appears to have chosen a conservative course in the absence of clearer guidance on the applicability of CERCLA procedural requirements, and final decisions on future site use. Earlier guidance on future site use could be helpful, but would not eliminate the risk involved in designing specific clean-up measures before the ROD. Because a large number of ERWM clean-up activities are in the RI/FS stage, a further review of this issue appears warranted.

OBSERVATION #6. THE ERWM TECHNOLOGY DEVELOPMENT PROGRAM WAS NOT ADEQUATELY INTEGRATED WITH ERWM FIELD OFFICE CLEAN-UP PLANNING TO ENSURE FULL UTILIZATION OF NEW TECHNOLOGIES.

Implementing efficacious and cost effective clean-up at ERWM sites in many cases will require the development and application of new and innovative technologies. In FY 1990, the Department established the ERWM Technology Development Program as an integral part of the ERWM clean-up effort. The Technology Development Program also has been included in the ERWM Five-Year

Plans. Both the OMB/Corps teams and the DOE ICE Team reviewed the planning process and the proposed funding level for the Technology Development Program.

OMB/Corps Review: The OMB/Corps teams observed several major problems in program planning and priority-setting in the Technology Development Program:

- **Linking Technology Development to ERWM Field Office Needs:** The review found that Technology Development priorities are established in DOE Headquarters through an ad hoc process. There was no systematic process to identify Field Office needs and relate those needs to Technology Development priorities;
- **Incorporating Technology Development Into the RI/FS Process:** The alternatives generally considered in the RI/FS process employ existing technology, where such technology is available. The OMB/Corps teams observed that ERWM officials appear to be reluctant to include new technology in the RI/FS process because of the risk that it may not work as planned or the risk that costs may increase. These are valid concerns, particularly in the context of having to meet legal requirements. Nevertheless, there may be opportunities where the successful deployment of innovative technology could improve effectiveness, lower costs or speed clean-ups. More and better opportunities to incorporate technology development into actual clean-up need to be developed; and
- **Improving Technology Transfer:** A large portion of the Technology Development Program funding is currently awarded on a non-competitive basis to the National Laboratories. This practice diminishes the potential benefits resulting from greater competition among new ideas. While the National Laboratories can play a key role in advancing the development of these technologies, the current program is not managed in a manner that would maximize technology transfer. These opportunities could be increased by measures such as requiring increased competition among alternative technologies, encouraging the laboratories to stimulate the formation of Government-industry R&D consortia, and requiring non-Federal cost sharing in instances where the technology may have applications at other than ERWM sites.

ICE Team Review: In its separate review of the Technology Development Program, the DOE ICE Team found that the Technology Development budget is essentially discretionary. The ICE Team analysis noted that:

- The Technology Development Program cannot be directly related to any legal requirement; and
- The Technology Development budget is not "needs-driven."

The ICE Team presentation to the IAG concluded that:

"The required Planning, Cost Estimating, Economic Analysis, Prioritization, and Progress/Performance Tracking Systems are not in place to permit efficient and defensible budget formulation and execution decisions."

FY 1993 Funding Level for Technology Development: The ERWM Five-Year Plan contained a preliminary unvalidated case estimate of \$539 million, an increase of 67 percent above FY 1992, for Technology Development, including Transportation Management. The DOE ADS Review study (PPL level) included an estimate of \$464 million. The official DOE budget request to OMB was \$359 million, an increase of 11 percent.

In its review of the proposed size of the ERWM Technology Development Program budget, as contained in the Five-Year Plan, the DOE ICE Team noted that:

"The Technology Development Budget is based on a percentage of the overall ERWM Budget (8 percent) plus funding for the Environmental Molecular Science Lab and Transportation Management."

The ICE Team found that this level was substantially greater than the R&D funding levels in similar programs in DOD and EPA, and also was far in excess of U.S. and international private sector R&D investment levels. This comparison is shown in Table 17. Based on this analysis, the ICE Team recommended that the FY 1993 funding level for the ERWM Technology Development Program be set at a level of 4 percent of total program cost, consistent with the U.S. industry average and EPA, with a target of 5 percent annual growth thereafter. The ICE Team recommended a FY 1993 funding level of \$254 million, a 21 percent decrease from the FY 1992 enacted level.

IAG Conclusion: The IAG concurred in the analyses and conclusions of the OMB/Corps team and the DOE ICE Team review regarding the problems in program planning for the Technology Development Program. With respect to funding, the IAG agreed upon a FY 1993 funding level of \$335 million, an increase of 4 percent above FY 1992. This level would continue on-going efforts until new planning and management processes are adopted. The FY 1993 funding level for Technology Development represents 6 percent of total ERWM funding in the President's FY 1993 Budget. Excluding Transportation Management, which technically is not an R&D program, the FY 1993 funding level is 5.9 percent of total ERWM funding. This level is significantly higher than the benchmarks cited in the DOE ICE Team analysis, and represents a continued commitment to an aggressive R&D program as an integral part of the Administration's clean-up effort.

Table 17

THE DOE ICE TEAM FOUND THAT THE ERWM TECHNOLOGY DEVELOPMENT PROGRAM FIVE-YEAR PLAN ESTIMATE REPRESENTS A MUCH LARGER SHARE OF THE TOTAL PROGRAM THAN OTHER R&D PROGRAMS.

<u>Federal Agency Programs</u>	<u>R&D Percentage of Total Funding</u>
ERWM-Preliminary Unvalidated Case 1/	8.1%
EPA Superfund	4.0%
<u>Private Industry Comparisons</u>	<u>R&D as Percentage of Sales</u>
United States Average	3.4%
<u>Selected Industries:</u>	
Metals and Mining	1.1
Telecommunications	3.6
Aerospace	3.7
Automotive	3.7
Chemicals	3.9
Electronics	5.3
Computers	8.4
Pharmaceutical	10.3
Japan Average	4.9%
Germany Average	6.1%
Source: DOE ICE Team	

Note:

1. The President's FY 1993 budget results in a funding level for Technology Development, including Transportation Management, that is 6 percent of the total ERWM funding. Excluding Transportation Management, which technically is not an R&D program, the FY 1993 budget for Technology Development R&D activities is 5.9 percent of total ERWM funding.

IV. FIELD OFFICE SUMMARIES

This section contains summary reports for each ERWM Field Office. Each summary contains the following information:

- a brief physical description of each of the sites assigned to each Field Office and its environmental problems;
- historical budget data and alternative funding levels for FY 1993;
- a description of the results of the "DOE FY 1993 ADS Review" applicable to that Field Office;
- a summary of the OMB/Corps teams' analysis of FY 1993 requirements based on the results of the DOE questionnaire;
- the recommended final FY 1993 budget for the site, and
- a discussion of the analysis of direct program costs, overhead costs and contingencies.

The summaries are arranged in alphabetical order, and include the following:

Albuquerque, NM

Chicago, IL

Fernald, OH

Idaho Field Office, ID

Nevada Test Site, NV

Oak Ridge, TN

Richland, WA

Rocky Flats, CO

San Francisco, CA

Savannah River, SC

Washington, DC Headquarters

SUMMARY: ALBUQUERQUE FIELD OFFICE

Description of the Site:

The Albuquerque Field Office oversees activities of 10 major programs and installations. The environmental restoration program of the Albuquerque Field Office includes 237 ADSs addressing activities at 9 programs and installations. The waste management program manages 160 ADSs involving 8 Albuquerque Field Office installations. Environmental restoration and waste management activities are required principally by RCRA, UMTRCA, and State statutes and regulations, further defined for each installation in permits, compliance agreements, consent orders, and DOE Orders.

Kansas City Plant

The Kansas City Plant is part of the Bannister Federal Complex, located 12 miles south of downtown Kansas City, Missouri. Manufacturing operations are housed in 3.2 million feet of building space. The plant mission is the manufacture of non-nuclear weapons components involving machining, plastic fabrication, and electrical and mechanical assembly. No radioactive materials are machined or processed.

Environmental restoration activities are conducted under the RCRA 3008(h) Administrative Order on Consent signed by DOE and EPA in 1989. Thirty-six sites are identified in the Order for assessment and remediation. Waste management activities consist primarily of waste storage, offsite shipment and disposal, and onsite wastewater treatment for industrial process wastewater.

Los Alamos National Laboratory (LANL)

LANL occupies 43 square miles in Los Alamos County, about 60 miles north of Albuquerque. Major programs at LANL include applied research in nuclear and conventional weapons development, nuclear fission and fusion, nuclear safeguards and security, and waste management. The environmental restoration program operates under a Hazardous and Solid Waste Amendments permit. Approximately 1,900 potential release sites, aggregated into 24 operable units, are currently scheduled for investigation. The waste management program is responsible for managing the hazardous, mixed, and radioactive wastes generated by laboratory operations. Major waste management activities in 1993 include construction of a radioactive asbestos burial pit, construction of a mixed waste receiving and storage facility, and restart of the Controlled Air Incinerator.

Mound Plant

The Mound Plant is located in Miamisburg in southwestern Ohio. The plant site occupies 306 acres of land 10 miles southwest of the Dayton metropolitan area. It is an integrated research, development, and production facility for DOE weapons and

energy programs. Mound primarily manufactures non-nuclear and tritium-containing components for nuclear weapons. Mound's environmental restoration program includes a CERCLA cleanup program and decontamination and decommissioning activities. A Federal Facility Agreement under CERCLA Section 120 was signed by DOE and EPA in August 1990. The waste management program handles sanitary, hazardous, radioactive, and mixed wastes. Major activities in 1993 include construction of a radioactive waste storage building and assessments of process waste streams.

Pantex Plant

The Pantex plant is located about 17 miles northeast of downtown Amarillo, Texas. Pantex includes a total land area of about 16,000 acres. The plant is operated to meet DOE's responsibilities for nuclear weapons assembly, stockpile monitoring, maintenance, modifications, and disassembly. The environmental restoration program is conducted in compliance with a RCRA Section 3008(h) Administrative Consent Order signed by DOE and EPA in 1990. Approximately 100 potential release sites have been identified at Pantex for investigation. Environmental restoration activities in 1993 include assessment and remediation of a number of these sites. The waste management program provides for the treatment, storage and disposal of radioactive and hazardous wastes, including some classified waste that is contaminated with lead or other land disposal restricted materials. Major waste management activities in 1993 include construction of a burn cage for high explosives and construction of a mixed waste storage facility.

Pinellas Plant

The Pinellas Plant is located on a 99 acre site 6 miles north of St. Petersburg in Pinellas County, Florida. Key activities at the Pinellas plant include design, development, and production of special electronic and mechanical equipment for nuclear weapons applications, including neutron generators, specialty capacitors, thermal batteries, crystal resonators, oscillators, and clocks. Environmental restoration at the Pinellas plant consists of a potentially responsible party involvement in the Peak Oil site, a State-led remediation of the 4.5 acre site, a RCRA closure of a hazardous waste holding tank, assessment and remediation of the Floridan Aquifer, and the assessment and cleanup of 15 solid waste management units under the Hazardous and Solid Waste Amendments (HSWA) permit. Waste management activities include treatment, storage, and disposal of low level radioactive and hazardous wastes.

Sandia National Laboratories - Albuquerque (SNLA)

SNLA is a research and development facility that primarily develops, engineers, and tests non-nuclear components of nuclear weapons. SNLA occupies 2,820 acres of land within Kirtland Air Force Base, directly south of Albuquerque, New Mexico. SNLA is also responsible for two offsite test areas: the Tonopah Test Range, occupying 640 square miles in Nevada; and the Kauai Test Facility located on the island of Kauai

within the Navy's Pacific Missile Range. The majority of SNLA's environmental restoration program is driven by the corrective action requirements of the RCRA Part B Operating Permit and the New Mexico underground storage tank laws. At the remaining sites, the program is driven by State law or by the requirements for CERCLA non-NPL sites. Major environmental restoration activities include interim cleanup of the Chemical Waste Landfill and assessment activities at several other sites. Waste management activities include treatment, storage, transportation and disposal of mixed and hazardous wastes, including classified hazardous wastes.

Sandia National Laboratories - Livermore (SNLL)

SNLL occupies 413 acres about 40 miles east of San Francisco in the Livermore Valley. SNLL consists of research and development laboratories dedicated to the design and testing of non-nuclear components for nuclear weapons systems. Major environmental restoration activities are conducted under a California Regional Water Quality Control Board Order, and include fuel oil spill remediation, Navy Landfill remediation, and assessment and remediation of other sites.

Uranium Mill Tailings Remedial Action Project (UMTRAP) and Uranium Mill Tailings Groundwater Restoration Project (UMTGRP)

UMTRAP and UMTGRP are two projects authorized in 1978 under the Uranium Mill Tailings Radiation Control Act, 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 environmental restoration program operates both projects. The mill tailings, located at 24 sites and approximately 5,000 vicinity properties in 10 States and on Tribal lands, are the result of uranium production from the early 1950s until the early 1970s. Vicinity properties are sites where tailings were used in the foundations of inhabited or commercial buildings or where tailings blew onto open land from mill sites. Tailings remediation and groundwater restoration of each site consist of a Remedial Action Plan approved by the State or Tribe and the Nuclear Regulatory Commission; Environmental Assessment or Environmental Impact Statement; design/engineering, construction, surveillance, and maintenance; and licensing by the NRC.

Waste Isolation Pilot Plant (WIPP)

WIPP, located 26 miles east of Carlsbad, New Mexico, is a research and development facility with the mission of demonstrating the safe disposal of radioactive transuranic (TRU) waste resulting from U.S. defense activities. Operated by the waste management program, WIPP is the only facility in the United States specifically designed and constructed for the long-term disposal of TRU wastes.

Inhalation Toxicology Research Institute (ITRI)

ITRI in Albuquerque, New Mexico, investigates the nature and magnitude of human health effects from the inhalation of airborne material. The laboratory houses up to 15,000 research animals and generates sanitary, hazardous, radioactive, and mixed wastes. Environmental restoration activities in 1993 include assessments for sanitary lagoons, diesel oil releases, hot ponds, and groundwater. Waste management activities in 1993 include upgrade of a waste treatment and storage facility.

Funding History

The following table shows funding levels for environmental restoration and waste management activities of Albuquerque Field Office programs and installations. Albuquerque Field Office funding increased by 31 percent from FY 1991 to FY 1992. The three DOE funding levels for FY 1993 suggest further growth from 7 percent in the DOE request to OMB, to 29 percent in the Unvalidated Field Estimate.

ALBUQUERQUE FIELD OFFICE FUNDING HISTORY
(BA, \$ in Millions)

FUNDING LEVEL	1991	1992	1993	1994	1995	1996	1997
Actual*	425.5	558.7					
Unvalidated Field Estimate			720.0	820.8	923.9	836.5	845.5
Program Planning Level			653.4				
DOE Budget Request to OMB			597.8				

*DOE estimate of allocation to Albuquerque as of 11/20/91.

DOE ADS Review

The September 4, 1991, DOE study "FY 1993 ADS Review" identified a total of \$653.4 million as necessary to fund legal requirements, DOE ES&H Orders, and discretionary activities of the Albuquerque Field Office (the Program Planning Level). Of this total, the report identified \$437.5 million as needed to meet all legal requirements.

"DOE FY 1993 ADS Review, September 4, 1991"
(\$ in Millions)

-----FY 1993-----

Category	# of ADSS	Unvalidated Field Estimate	Program Planning Level	DOE Budget Request to OMB
Legally Required	255	\$475.9	\$437.5	\$379.9
DOE ES&H Orders	38	231.3	225.1	207.5
Discretionary	104	12.8	-9.2	10.4
TOTAL	397	\$720.0	\$653.4	\$597.8

OMB/Corps Review of Funding Requirements

A joint OMB/Corps review team met with staff and contractors at the Albuquerque Field Office and several sites from December 2-6, 1991, to review DOE responses to the questionnaire sent out to refine the information in the DOE study. The team reviewed legal requirements, legally-mandated milestones, and backup information for all 397 ADSSs. A total of 468 subactivities were reviewed.

In addition, the team conducted briefings with DOE staff before and after the site visit and met with EPA regional and Headquarters staff. OMB staff spoke with representatives of the New Mexico Environment Department to discuss the problems at Albuquerque Field Office sites and obtain their views on the progress of the DOE cleanup and waste management efforts.

DOE responses to the questionnaire significantly revised the categorization of activities presented in the earlier DOE study. The table below compares the September 4, 1991, DOE study to DOE responses to the questionnaire.

Of the 468 subactivities at the Albuquerque Field Office, the DOE questionnaire response identified 327 subactivities as legally-required or required by DOE ES&H Orders. Fifty subactivities were identified as required by DOE management Orders, and 91 subactivities were identified as discretionary. Subactivities identified as legally-required or required by DOE ES&H Orders were recommended for funding at the PPL level. Subactivities driven by DOE management Orders or discretionary activities were recommended for funding at the level of the DOE request to OMB. Based on this analysis, the OMB/Corps review team recommended to the Interagency Group that the Albuquerque Field Office receive \$639.5 million funding for ERWM activities in FY 1993.

Final FY 1993 Budget Allocation

After the IAG meeting, DOE requested that the Interagency Group provide an additional \$5.8 million for activities in the Uranium Mill Tailings Remedial Action Program that had not been identified in the original questionnaire response. The Interagency Group granted the entire \$5.8 million increase. As a result, the final recommended funding level for ERWM activities at the Albuquerque Field Office is \$645.3 million.

OMB/CORPS ANALYSIS OF DOE ADS REVIEW REPORT **(Based on Program Planning Level)** **(\$ in Millions)**

DOE ADS Review	DOE Questionnaire Response		Proposed Funding Level
Legally Required	Legally Required	\$416.8	\$421.9
	DOE ES&H Orders	7.8	7.8
	DOE Management	4.9	4.8
\$437.5	Orders	8.1	8.1
	Discretionary		
	Subtotal	\$437.5	\$442.6
DOE ES&H Orders	Legally Required	\$ 13.5	\$ 13.5
	DOE ES&H Orders	12.2	12.0
	DOE Management	199.4	186.5
\$225.1	Orders	0	0
	Discretionary		
	Subtotal	\$225.1	\$212.0
Discretionary	Legally Required	\$-18.9	\$-18.9
	DOE ES&H Orders	5.4	5.4
	DOE Management	0	0
\$-9.2	Orders	4.3	4.3
	Discretionary		
	Subtotal	\$-9.2	\$-9.2
\$653.4	Total	\$653.4	\$645.3

Cost Review Summary

The Corps review team conducted an in-depth review of 10 ADSs focusing on cost and overhead procedures used by the Albuquerque Field Office. The review covered both environmental restoration and waste management activities. In addition, 17 separate

ADSs were evaluated for the reasonableness of the cost estimates. For 9 of them, the ADSs were found to include unreasonable estimates.

A major finding of the cost analysis is that overhead rates are higher in comparison to DOE direct costs than the same overhead categories for comparable Corps projects. DOE costs for project management, program direction and contractor overhead were estimated to exceed Corps costs for comparable activities by 295 percent. DOE project costs were estimated to exceed Corps costs for comparable activities by 48 percent.

The review identified several weaknesses in cost estimating and accounting practices for ERWM activities. These weaknesses included: failure to follow DOE cost estimating guidance at LANL; use of incorrect rates and factors; incorrect calculation of rates and factors; high design and construction management costs; excessive FTE costs; incomplete or nonexistent documentation of the cost basis for certain activities; and inability to track actual costs at the same level of detail as the cost estimates.

No reduction in recommended funding level was applied based on the cost analysis. Instead, the findings on cost estimates formed the basis of long-term recommendations to address overhead and contractor management issues. These recommendations are presented in Chapter Five.

SUMMARY: CHICAGO FIELD OFFICE

Description of the Site:

The Chicago Field Office oversees activities at 7 installations. The environmental restoration program of the Chicago Field Office includes 93 ADSs addressing activities at all 7 installations. The waste management program manages 129 ADSs involving 6 Chicago Field Office installations. Environmental restoration and waste management activities are required principally by RCRA and CERCLA, further defined for each site in permits, compliance agreements, and DOE Orders.

Argonne National Laboratory - East (ANL-E)

ANL-E occupies a 1700 acre tract located about 22 miles southwest of downtown Chicago, in DuPage County, Illinois. ANL-E conducts basic and applied research to support the development of energy-related technologies. Environmental restoration activities include characterization of the 317/319 areas and the 800 area landfill, remediation of the 570 holding pond, and D&D of the EBWR. Waste management activities include ongoing treatment, storage and disposal of wastes, upgrade of a waste storage facility, replacement of an underground storage tank, and operation of a waste minimization program.

Argonne National Laboratory - West (ANL-W)

ANL-W is located on the southeastern portion of the Idaho National Engineering Laboratory (INEL) near Idaho Falls, Idaho. The primary mission is research and development in support of the nation's advanced reactor program. INEL was placed on the National Priorities List in 1989. Environmental restoration activities are conducted under the INEL Consent Order and Compliance Agreement (COCA) signed in 1987, and the Federal Facility Agreement and Consent Order, signed by DOE, EPA, and the State of Idaho in December 1991. Principle activities include cleanup of a PCB spill and D&D of the Central Liquid Processing area. Major waste management activities include UST upgrades, design of a radioactive sodium waste process facility, and shipment of waste to the INEL Radioactive Waste Management Center.

Battelle Columbus Laboratories (BCL)

Since mid-1943, the Battelle Memorial Institute has continuously performed contract research and development work at its Columbus Laboratories for DOE and its predecessor agencies. Battelle is no longer performing research for DOE but has maintained its NRC license for the facility and performs monitoring and surveillance at 15 buildings and small ground areas contaminated by radioactivity. The buildings and grounds are at two sites, 9 buildings adjacent to the Ohio State University campus site and 6 buildings 15 miles from Columbus, Ohio. The environmental restoration program will decontaminate these 15 buildings that became radioactively

contaminated as a result of performance of work under the government contract and release the buildings to BCL.

Brookhaven National Laboratory (BNL)

BNL is a multipurpose R&D laboratory located in central Suffolk County of Long Island about 60 miles east of New York City. The laboratory is located over an EPA-designated sole-source drinking water aquifer. In 1989 EPA included BNL on the National Priorities List. Environmental restoration activities are conducted in accordance with a Federal Facility Agreement under RCRA and CERCLA, signed by DOE, EPA, and the State of New York in 1992. Environmental restoration activities include RI/FSs; groundwater, soil, sediments, air, and surface water assessments; and dismantlement of radioactive tanks. Major waste management activities include upgrade of a sewage system, construction of waste minimization upgrades, and construction of the Hazardous Waste Management Facility.

Ames Laboratory

Ames Laboratory, located at Iowa State University in Ames, Iowa, conducts basic research in materials and chemicals sciences and related research in materials reliability and nondestructive evaluation. Environmental restoration activities in 1993 include completion of Chemical Disposal Site characterization and contaminated soil removal. Waste management activities include ongoing LLW and hazardous waste shipments offsite.

Fermi National Accelerator Laboratory

Located west of Chicago, Illinois, Fermi is a single-program installation for exploring the fundamental structure of matter using high-energy particle accelerators. The environmental restoration program consists of the assessment and cleanup, if necessary, of possible chromate contamination. The waste management program will be continuing its PCB cleanup program during 1993.

Princeton Plasma Physics Laboratory

Located in Princeton, New Jersey, this site conducts research in magnetic confinement fusion and also investigates the practical applications of plasma physics. The environmental restoration program will be conducting groundwater remediation in 1993.

Funding History

The following table shows funding levels for environmental restoration and waste management activities of Chicago Field Office Installations. Chicago Field Office funding grew by 2 percent from FY 1991 to FY 1992. The three DOE funding levels

for FY 1993 suggest further growth from 1 percent in the DOE request to OMB, to as much as 75 percent in the Unvalidated Field Estimate.

CHICAGO FIELD OFFICE FUNDING HISTORY
(BA, \$ in Millions)

FUNDING LEVEL	1991	1992	1993	1994	1995	1996	1997
Actual*	58.4	59.7					
Unvalidated Field Estimate			104.5	106.1	117.6	100.1	109.6
Program Planning Level			100.3				
DOE Budget Request to OMB			60.5				

*DOE estimate of allocation to Chicago, as of 11/20/91.

DOE ADS Review

The September 4, 1991, DOE study "FY 1993 ADS Review" identified a total of \$100.3 million as necessary to fund legal requirements, DOE ES&H Orders, and discretionary activities of the Chicago Field Office (the Program Planning Level). Of this total, the report identified \$78.1 million as needed to meet all legal requirements.

"DOE FY 1993 ADS Review, September 4, 1991"
(\$ in Millions)
-----FY 1993-----

Category	# of ADSs	Unvalidated Field Estimate	Program Planning Level	DOE Budget Request to OMB
Legally Required	110	\$81.6	\$78.1	\$48.6
DOE ES&H Orders	25	13.2	12.2	7.7
Discretionary	87	9.6	10.0	4.2
TOTAL	222	\$104.5	\$100.3	\$60.5

OMB/Corps Review of Funding Requirements

A joint OMB/Corps review team met with staff and contractors at the Chicago Field Office to review DOE responses to the questionnaire sent out to refine the information in the DOE study. The OMB site visit was November 14-15, the Corps site visit was December 5-6, 1991. The team reviewed legal requirements, legally-mandated milestones, and backup information for 195 ADSs. Those ADSs not reviewed had zero dollars budgeted in FY 1993.

DOE responses to the questionnaire significantly revised the categorization of activities presented in the earlier DOE study. The table below compares the September 4, 1991, DOE study to DOE responses to the questionnaire.

Of the 198 subactivities at the Chicago Field Office, the DOE questionnaire response identified 107 subactivities as legally required or required by DOE ES&H Orders. Six subactivities were identified as required by DOE management Orders, and 85 subactivities were identified as discretionary. Subactivities identified as legally required or required by DOE ES&H Orders were recommended for funding at the PPL level. Exceptions to this rule were made only for representations by DOE that the DOE budget request level was sufficient to meet all compliance requirements in FY 1993 for ADSs encompassed by the Brookhaven National Laboratory CERCLA Interagency Agreement and 37 other subactivities. Subactivities driven by DOE management Orders or discretionary activities were recommended for funding at the level of the DOE request to OMB. Based on this analysis, the OMB/Corps review team recommended to the Interagency Group that the Chicago Field Office receive \$79 million funding for ERWM activities in FY 1993.

Final FY 1993 Budget Allocation

After the IAG meeting, DOE requested that 10 ERWM subactivities be reclassified as legally required or required by DOE ES&H Orders, and therefore that these subactivities be funded at the PPL level. The Interagency Group granted the entire \$5.5 million increase. As a result, the final recommended funding level for ERWM activities at the Chicago Field Office is \$84.5 million.

OMB/CORPS ANALYSIS OF DOE ADS REVIEW REPORT
(Based on Program Planning Level)
(\$ in Millions)

DOE ADS Review	DOE Questionnaire Responses		Proposed Funding Level
Legally Required	Legally Required	\$53.8	\$43.9*
	DOE ES&H Orders	16.1	15.6*
	DOE Management Orders	0.4	0.4
\$ 78.1	Discretionary	7.8	3.1
	Subtotal	\$78.1	\$62.9
DOE ES&H Orders	Legally Required	\$2.0	\$ 1.9*
	DOE ES&H Orders	10.1	9.7*
	DOE Management Orders	0	0
\$ 12.2	Discretionary	0.2	0.2
	Subtotal	\$12.2	\$11.8
Discretionary	Legally Required	\$0.3	\$ 0.3
	DOE ES&H Orders	7.6	7.6
	DOE Management Orders	0	0
\$ 10.0	Discretionary	2.0	1.9
	Subtotal	\$10.0	\$ 9.8
\$100.3	TOTAL	\$100.3	\$84.5

*The difference between the PPL and the proposed funding level is due to revised DOE cost estimates for certain ADSs.

Cost Review Summary

The Corps review team conducted an in-depth review of 7 ADSs focusing on cost and overhead procedures. Of the 7 ADSs, only two had sufficient detail to compare costs with comparable Corps activities and only one had adequate cost back-up documentation. Other ADSs reviewed were poorly planned and reflected an undetermined level of effort as the basis for the FY 1993 baseline estimate.

A major finding of the cost analysis is that overhead rates are higher in comparison to DOE direct costs than the same overhead categories for comparable Corps projects. DOE costs for project management, program direction, and contractor overhead were estimated to exceed Corps costs for comparable activities by 124 percent. DOE total project costs were estimated to exceed Corps costs for comparable activities by 49 percent.

The review also found that DOE contracting procedures include substantial subcontracting and layering of contractors. There appeared to be inadequate direct

supervision of contractors and of their technical design work by DOE personnel. DOE contracting procedures tend to provide little direct government supervision and may result in increased overhead, profit, and management costs. The analysis also revealed that DOE cost estimates were higher than Corps costs for several items.

No reduction in recommended funding level was applied based on the cost analysis. Instead, the findings on cost estimates formed the basis of long-term recommendations to address overhead and contractor management issues. These recommendations are presented in Chapter Five.

SUMMARY: FERNALD FIELD OFFICE

Description of the Site:

Feed Materials Production Center (FMPC), which occupies a 1,050 acre site near Fernald, Ohio, 18 miles northwest of Cincinnati, is a facility whose primary mission from the early 1950's to July 1989 was the production of uranium metals and compounds. Currently, the site's main activity is environmental restoration, employing approximately 1,500 personnel. The site is on the National Priorities List and has been divided into 5 distinct operable units for remediation purposes. Cleanup at the nearby Reactive Metals, Inc. (RMI) extrusion plant in Ashtabula, Ohio is being performed in conjunction with these activities.

The site has 6 waste pits, a burn pit, and a clearwell which together contain approximately 467,392 cubic yards of solid/sludge wastes and 2.3 million gallons of surface water waste. These wastes contain significant quantities of uranium, thorium, and barium. The soil around the pits is contaminated, with contamination thought to extend to the Great Miami Aquifer. In total, 1.8 million cubic yards of contaminated material needs remediation as summarized below.

CONTAMINATED WASTES AT FERNALD

(Cu. Yds)	Low Level	LL-Mixed	Solid	Total
Inventory	1,032,148	746,241	59,000	1,837,389
Generation rate (yr)	2,864	151	60	3,075

Other areas in need of remediation include the former production area consisting of 110 buildings and numerous scrap metal piles that are a source of soil and groundwater contamination. A major plume of contaminated groundwater heading slowly toward the Miami River is undergoing remediation. The site contains ponds with 16,500 cubic yards of sludge from water treatment facilities, and fly ash piles generated from the site's coal-fired boiler plant.

Three large silos at FMPC hold radioactive materials. Silos 1 and 2 contain an enriched uranium ore with a high radium content known as K-65. Silo 3 holds metal oxide processing wastes which contain radium, radon, uranium, and thorium. Radon gas is slowly diffusing out of silos 1 and 2, which due to its mobile nature is a serious environmental problem. DOE has addressed the radon gas problem through a removal action for the K-65 silos that was completed on November 28, 1991. The site also has a considerable inventory of contained waste. There are over 16,000 drum-equivalents of thorium and over 200,000 drum-equivalents of low-level waste.

Funding History

During 1990 and 1991, Fernald was transitioning from a materials production facility to a facility undergoing environmental restoration. The actual funds available for FY 1991 and 1992 are distorted by a \$96.5 million supplemental appropriation, nearly all of which (about \$90 million) carried over into FY 1992. Actual funding available for use in FY 1992 was \$301.4 million, a 30 percent increase above the \$232.7 million level in FY 1991. Fernald's FY 1993 budget request is about the same level as FY 1992 because of the major changes made to the Consent Agreement in September, 1991 as discussed in the next section. Outyear estimates as shown in table below were those available prior to the signing of the amended Consent Agreement and are obsolete. Fernald will develop revised outyear estimates for inclusion in the next update of DOE's Five Year plan.

FERNALD FIELD OFFICE FUNDING HISTORY
(BA, \$ in Millions)

Funding Level	1991	1992	1993	1994	1995	1996	1997
Actual	232.7 ¹	211.4 ²					
Unvalidated Field Estimate			472.0 +123%	508.3	551.0	478.6	418.3
Program Planning Level			407.0 + 92%				
DOE Budget Request			307.9 + 46%				

¹ Environmental Management (EM) received \$232.7 million in FY 1991, of which \$96.5 million was a supplemental enacted late in FY 1991.

² Excludes about \$90 million carried over from the FY 1991 supplemental appropriation.

Legally Required DOE Orders and Discretionary Activities at Fernald

The major legal requirement is the Consent Agreement between EPA Region 5 and the DOE. Signed in 1990 and amended in September 1991, the Consent Agreement is a plan and schedule for bringing the site into compliance with RCRA, and primarily, CERCLA. The State of Ohio is not a co-signer of the agreement but works closely with DOE and EPA on the agreement's content and implementation. In addition, DOE entered into a consent decree with the state, which was issued in December 1988 and amended in December 1990, that stipulates remediation work to be done at Fernald. Other applicable statutes include RCRA, CERCLA, OSHA, NEPA, the Clean Air and Water Acts, and the Atomic Energy Act. Also, a number of DOE environmental, health, and safety and DOE management orders apply to the site cleanup program.

FY 1993 funding for Fernald was altered significantly by a major amendment to the Consent Agreement signed on September 20, 1991. The amended Consent Agreement revised key milestones at the site, extended Record of Decision dates by 2 to 5 years, and expanded the scope of the cleanup to cover the entire former production area. Other important new requirements include early waste removal actions for some of the more environmentally sensitive wastes that readily can be removed. These include removal of site inventories of thorium and low level wastes; action to control radon emissions from silos 1 and 2; collection and treatment of the major groundwater contamination plume and uncontrolled production area water runoff; improved storage of soil and debris on site; and control of exposed material in waste pit 5. FY-1993 figures for the Unvalidated Field Estimate, Program Planning Level, and DOE Budget Request before and after the amendment are summarized in the following table.

FY 1993 FERNALD FUNDING LEVELS
(\$ in Millions)

Consent Agreement	Unvalidated Field Estimate	Program Planning Level	DOE Budget Request
Pre-amended Consent Agreement	\$472.0	\$407.0	\$307.9
Amended Consent Agreement (9/20/91)	\$307.9	\$307.9	\$307.9

OMB staff, jointly with personnel from the U.S. Army Corps of Engineers (Corps), examined the legal requirements and costs estimates for each of the 167 subactivities within the 16 Activity Data Sheets (ADS). All funding is under the Environmental Restoration program, which has overall responsibility for the site. The OMB/Corps team visited the site on October 16th through October 18, 1991 to review in detail with site personnel the legal requirements and supporting cost justification for each subactivity within each ADS. The team also met with EPA Headquarters and Region 5 staff on October 22, 1991. In this way, a comprehensive review of Fernald's requirements, priorities, costs, schedules, overhead and cost estimating methods was attempted.

At the time of the site visit, DOE had not identified legal drivers for most of the ADS's subactivities and did not have cost backup to support the \$307.9 million request. The detailed cost review was postponed to give DOE more time to prepare estimates and justification in support of its request. Some of this material was provided by DOE in early December but it was still deficient. Parts of the OMB/Corps detailed cost review could not be completed because of the lack of cost justification.

DOE ADS Review

DOE's ADS Review Report of September 4, 1991 examined the legal requirements behind the Fernald site budget request at the ADS level. It classified funding either as "Legally required", "DOE orders", or as "discretionary" only at the ADS level. DOE found \$276.0 million or 89.6 percent of the FY93 budget request to be legally required; DOE orders accounted for \$18.8 million or 6.1 percent and discretionary for \$13.1 million or 4.3 percent as shown in the following table.

OMB/Corps Review of Funding Requirements

The OMB/Corps review of Fernald ADS's resulted in a different categorization of Fernald funding since it classified legal requirements for each individual subactivity within an ADS whereas DOE classified an entire ADS in the category that best suited the majority of the funding in that ADS. This greater level of detail results in a more accurate classification of the site's funding requirements because a number of ADS's had subactivities that fell under different classifications. A comparison of the DOE ADS review report with the results from the IAG review is shown in the following table.

COMPARISON OF LEGALLY REQUIRED FUNDING
(\$ in millions)

Category	DOE ADS Review Classification		Classification After IAG Review ⁶	
	Funding	%	Funding	%
Legally Required ¹	\$276.0 ⁴	89.6	\$216.6	70.3
DOE ES&H Orders	18.8	6.1	70.8	23.0
Discretionary ²	13.1	4.3	20.4	6.6
TOTAL ³	\$307.9 ⁵	100.0	\$307.9	\$100.0

¹ Includes \$18.5 million classified by the OMB/Corps as legally required after FY 1993.

² Includes the OMB/Corps classification of no documentation.

³ Totals may not add due to rounding.

⁴ Of this amount \$61.4 million is for DOE orders.

⁵ Subsequent to the DOE ADS review report, the ADS-by-ADS allocation of the \$307.9 million DOE budget request was revised. The OMB/Corps analysis was done on the revised request. For this reason, the category funding subtotals are not exact between DOE and OMB/Corps.

⁶ The classification of ADSs and subactivities was not based on the DOE questionnaire because Fernald was the first site to be visited by an OMB/Corps team, and the DOE questionnaire was not developed at that time. Instead, a worksheet was used that was the forerunner to the DOE questionnaire. The Fernald visit provided information that was used to design the questionnaire used at other sites.

Reasons for the major differences include:

- Two Fernald ADS's totalling \$58.7 million, one for base services and the other for overall site program management, were classified by DOE as legally required. The OMB/Corps team found most of the subactivities in these ADS's to be supported primarily by DOE Orders, with only \$5.1 million found to be legally required. This accounts for \$53.6 of the difference between the two reviews for legally required and DOE orders.
- DOE also classified the Litigation Support ADS of \$13.1 million as discretionary. OMB/Corps classified it as legally required since DOE is bound under contract to the former site contractor to pay all legal costs. This was the only ADS classified by DOE as discretionary.
- OMB/Corps found 13 subactivities that were discretionary in 8 other ADS's totalling \$20.4 million. DOE had these subactivities classified as legally required because they assume that since most of the ADS funding was legally required, all of it was. Examples of discretionary ADS subactivities found at Fernald are summarized in the table on page 6.

A further comparison of the DOE ADS review report with the results of the IAG review is shown in the table on the following page. As illustrated by the table, DOE's "DOE ES&H Orders" category has only the \$18.8 million, which represents the funding for the ADS Environmental Monitoring. The more detailed IAG review classified this ADS as having \$7.7 million as discretionary, or 43 percent of the revised funding level for this ADS, \$9.5 million as DOE orders and \$.6 million as legally required.

**EXAMPLES OF SUBACTIVITIES CLASSIFIED AS DISCRETIONARY
IN OMB/CORPS REVIEW
(\$ in Millions)**

ADS Number	ADS Activity/Subactivity	FY 1993 Amount	Reason for Classification
47-B2 OU2	Error in budget	\$6.3	DOE and contractor program managers say that the budget request is \$6.3 million above what is needed for FY 1993.
8-B1 Program Management	AE mobilization (PARSONS)	\$0.5	There is no DOE legal documentation backup for recruitment, relocation and upgrading office space for contractor (PARSON).
60-D1 Litigation	National Lead of Ohio legal expenses	\$0.4	Duplication of escalation factor accounts for \$0.2 million, the remaining \$0.2 million is unexplained.
64-D1 Env. Monitoring	<ul style="list-style-type: none"> • Groundwater Monitoring • Air and Water Sampling • Improve Monitoring Program • Sample Site Grid • Lab Relocation • Capital Expenditures 	<ul style="list-style-type: none"> \$1.2 \$3.5 \$0.7 \$0.2 \$0.4 \$1.8 	<ul style="list-style-type: none"> • Requests above FY92 are in excess of legal requirements. • Requests above FY92 are in excess of legal requirements. • There is no legal requirement for this activity. • There is no legal requirement for this activity. • There is no legal requirement for this activity. • Capital expenditures that are unspecified and not legally required.
68-D1 Base Services	Cafeteria	\$0.3	Not legally required to have an on-site cafeteria supported by DOE funding.
69-D1 CERCLA Support	Capital projects (management decision)	\$1.4	Not legally required funding for an emergency response training facility, misc. equipment, and startup for project installations.
16-C3 Waste Management	Capital equipment (management decision)	\$2.3	Not legally required improvements to buildings, equipment.

OMB/CORPS ANALYSIS OF DOE ADS REVIEW REPORT
(\$ in Millions)¹

DOE ADS Review Classification²	Classification After IAG Review	FY 1993
<ul style="list-style-type: none"> • Legally Required <p align="right">\$276.0</p>	<ul style="list-style-type: none"> Legally Required³ DOE Orders Discretionary No Documentation <p align="right">Subtotal</p>	<p>\$203.4</p> <p>\$ 61.4</p> <p>\$ 11.0</p> <p>\$ 1.3</p> <p>-----</p> <p>\$277.1</p>
<ul style="list-style-type: none"> • DOE ES&H Orders <p align="right">\$ 18.8</p>	<ul style="list-style-type: none"> Legally Required DOE Orders Discretionary <p align="right">Subtotal</p>	<p>\$ 0.6</p> <p>\$ 9.5</p> <p>\$ 7.7</p> <p>-----</p> <p>\$ 17.8</p>
<ul style="list-style-type: none"> • Discretionary <p align="right">\$ 13.1</p>	<ul style="list-style-type: none"> Legally Required Discretionary <p align="right">Subtotal</p>	<p>\$ 12.7</p> <p>\$ 0.4</p> <p>-----</p> <p>\$ 13.1</p>
<p align="right">Total \$307.9</p>	<p align="right">Total</p>	<p align="right">\$307.9</p>

¹ Totals may not add due to rounding.

² Subsequent to the DOE ADS review report, the ADS-by-ADS funding allocation of the \$307.9 million DOE budget request was revised. The OMB/Corps analysis was done on the revised request. For this reason, the category funding subtotals are not exact between the two columns.

³ Includes \$18.5 that is legally required after FY 1993.

Final FY 1993 Budget Allocation

These analyses and findings were presented to the Interagency Group on November 19, 1991 and detailed backup materials were provided to DOE and EPA for review and comment. Based on DOE/EPA suggested changes and review by OMB/Corps of the limited detailed cost backup that was later made available by DOE, \$307.9 million was determined to be sufficient to meet all legal requirements, DOE orders and all discretionary funding proposals. This is shown in the following table.

FERNALD TOTAL
(\$ in Millions)

	Required	DOE Orders	All Other	Total
11/19/91 IAG	216.6	70.8	20.4	307.9

\$307.9 million has been included in DOE's FY 1993 budget request. The OMB/Corps team analysis shows that DOE's request of \$307.9 million for the Fernald site is probably more than what is needed to meet legal, ES&H, management, and discretionary needs. Finally, as of the end of FY 1991, Fernald had \$127 million in obligated but uncommitted funds carryover from prior years and \$124 million in obligated and committed but uncosted funds carryover. These year-end balances are increasing each year and this may indicate prior year funds are no longer needed for the purpose intended. A thorough review of the extent to which these balances are legally required needs to be completed by DOE.

Cost Review Summary

The review of the Fernald site by the OMB/Corps team included an examination of the supporting cost estimates for each ADS subactivity where cost data was made available. In general, the supporting cost backup provided by DOE in late November was not complete. The findings of the cost review are as follows:

Indirect Costs Are Very High And Can Be Reduced

In total, for every dollar budgeted at Fernald on direct materials and labor for environmental remediation, another \$1.94 is budgeted on indirect costs as shown in the following table. Of the \$307.9 million requested by Fernald site management, only \$104.8 million goes to direct materials and labor. Nearly two-thirds or \$203.1 goes for indirect costs, including overhead, administrative and site landlord activities.

SITE COST BREAKDOWN BY FUNCTION
(**\$in Millions**)

<u>Direct</u>	
• Direct labor and materials	<u>\$104.8</u>
<u>Indirect/Overhead & Administrative</u>	
• M&O contractor administrative support	\$40.0
• Subcontractor overhead, fees, administration	39.6
• M&O contractor fee	<u>17.0</u>
Sub-Total	\$96.6
<u>Indirect/Landlord*</u>	
• M&O site-wide landlord activities	\$106.5
Total Indirect	<u>\$203.1</u>
Total Budget Request	<u>\$307.9</u>

*Landlord activities include general site support, maintenance, operations, and physical infrastructure support. The ERWM program is responsible for landlord activities at Fernald, Idaho, Richland and part of Oak Ridge. In order to ensure consistency, the Corps analysis of overhead costs excluded landlord activities.

Indirect support and administrative cost at Fernald substantially raise the overall cost of completing remediation work. For example, the OMB/Corps team's analysis disclosed that constructing temporary trailer office space at the site is estimated and budgeted at \$160.36 per square foot compared to only \$128.00 per square foot for constructing new permanent quality office space in the Washington, D.C., metropolitan area. DOE has recognized this problem and plans to restructure its contractor arrangement by using an Environmental Remediation and Management Contractor (ERMC), a prime contractor directly overseeing subcontractors. However, substantially more oversight by DOE personnel is needed including the development of an independent DOE cost estimating budget preparation and construction contractor oversight staff capability.

The OMB/Corps analysis has disclosed that substantial cost savings can be achieved by implementing cost-effective remediation solutions at Fernald. Opportunities to reduce indirect costs include:

- Project management expenses total \$52.8 million. This is roughly 20.7 percent of the remaining \$255.1 million at Fernald. This appears excessive.

- Subcontractor management, overhead, profit and fees are too high and probably also can be reduced.

The implementation of the ERM concept should result in lower costs by consolidating site remediation and management into a more focused effort. In addition, rather than parcelling out broad areas of work, the ERM will be able to issue detailed scopes of work thus reducing manpower requirements and increasing competition among contractors competing for the work. The ERM contractor approach is scheduled for implementation at Fernald by FY 1993.

DOE must act to implement these reforms as soon as possible in order to assure that cleanup dollars are spent effectively on waste cleanup and not on excessive overhead costs.

Certain Cost Estimates Are Over-Estimated

A detailed review of selected cost estimates used in the FY 1993 budget request disclosed excessive costs. For example, architect/engineer contractor estimated transportation costs averaged \$819 per trip. This is roughly twice the comparable cost of \$400 per trip estimated by the OMB/Corps team as reasonable for a possible savings of \$169,750 in the Program Management ADS totalling \$58.7 million. DOE estimated that 25 Computer Aided Drafting and Design stations would cost \$45,000 each. The OMB/Corps team review showed that a top model CADD could be purchased for about \$18,000 for a possible savings of \$675,000. Furthermore, DOE could not justify why 25 CADD's were needed. DOE estimated 53,333 square feet (sf) of office space for 258 Architect-Engineer employees or 207 sf/employee. Per GSA regulations, the government standard is 153 sf/employee, which includes secondary and support space. These office space costs are potentially overstated by \$208,980. Also, litigation costs for the defense of National Lead of Ohio were overestimated when escalation was applied to the cost estimate twice.

SUMMARY: IDAHO FIELD OFFICE

Description of the Site:

The Idaho Field Office is located on the site of the Idaho National Engineering Laboratory (INEL) near Idaho Falls, Idaho. The Idaho Field Office is responsible for all the activities at INEL, plus environmental work activities at Grand Junction, Colorado (soon to be transferred to the Albuquerque Field Office), Monticello, Utah and West Valley, New York.

Idaho National Engineering Laboratory

INEL comprises 893 square miles. It is located on the Snake River plain, 4800 feet above sea level. The area is a high desert, receiving about 15 inches of rain per year.

Underlying the site is a large groundwater aquifer that discharges to the Snake River. On average, water moves about 10-20 feet per day and feeds numerous springs along the Snake River. The amount of water, nevertheless, is large. Lateral flow is about 1 billion gallons per day. The groundwater is used to irrigate farms as far as 200 miles away.

Originally established in 1949 as the National Reactor Testing Station, there are 52 reactors on the site. In addition the site supports a test reactor and training area for the Navy nuclear program.

One of the major efforts at the site is the Idaho Chemical Processing Plant (ICPP). This is a facility that accepts spent fuel from Naval reactors, processes the fuel and produces a high level waste in the form of calcine. The calcine is currently stored on the site.

Environmental restoration projects at the site are described in 33 separate ADSs. Cleanup activities were until recently covered under a RCRA Consent Order and Compliance Agreement (COCA) signed in 1987. In 1989, the entire INEL site was placed on the National Priorities List based on groundwater contamination at three separate locations. On December 9, 1991, DOE signed a CERCLA Federal Facilities Agreement for the cleanup program, which now supersedes the COCA.

The waste management program is responsible for management of waste from facilities around the site. The largest single activity is the Radioactive Waste Management Complex, where transuranic (TRU) waste is stored and prepared for shipment to WIPP. There are currently two Consent Orders for specific corrective actions that are to be signed soon.

Idaho Chemical Processing Plant

This facility is the single largest project in the ERWM program. At the present time, the most important issue is the replacement of high level waste tanks that are out of compliance with seismic safety requirements. A Consent Order with the State of Idaho covering the tanks (Notice of Noncompliance) has been negotiated but not yet signed.

Grand Junction

The Grand Junction site is located on 56 acres south-west of Grand Junction Colorado. DOE owns the site. It was established in 1943 to process concentrates of uranium oxide and has been used to support various Government nuclear activities since 1950. It was used as a pilot plant from 1953 to 1958 to develop uranium extraction processes.

The site and many vicinity properties are contaminated with uranium mill tailings. Cleanup is required under the Uranium Mill Tailings Radiation Control Act. There are no mandated milestones.

Monticello

Monticello, Utah was the site of a Government-owned uranium mill that was operated from 1940 to 1960. The mill site consists of approximately 78 acres. Tailings piles are located in the floodplain of Montezuma Creek. The site contains approximately 1.8 million cubic yards of uranium mill tailings and radioactively contaminated soils.

There are approximately 1,000 vicinity properties that will be surveyed for contamination. Currently there are approximately 550 properties included for remediation.

This site already has a CERCLA Record of Decision (ROD). There is a milestone requiring cleanup by the year 2000.

West Valley

West Valley, near Buffalo, New York, was designed as a plant that would reprocess fuel from commercial reactors. The plant operated for a short time, was shut down for modifications, and never reopened. The site contains contaminated buildings as well as two tanks of high level radioactive waste.

DOE received jurisdiction over the plant through the West Valley Demonstration Project Act (PL 96-368). The Act requires DOE to solidify the high level waste, develop containers suitable for permanent disposal, transport the waste to a repository, dispose of any waste generated in the above processes, then decontaminate and decommission the facilities. There are no future milestones.

Funding History

Shown below is a funding history for the ERWM activities under the Idaho Field Office through FY 1992. The table also includes projections for growth based on the DOE's Unvalidated Field Estimate. Note that DOE estimates that the period of rapid growth is almost over, that the budget is expected to stabilize after 1994.

IDAHO FIELD OFFICE FUNDING HISTORY (BA, \$ in Millions)

FUNDING LEVEL	1991	1992	1993	1994	1995	1996	1997
Actual	455	526					
Unvalidated Field Estimate			646	704	654	696	678
Program Planning Level			624				
DOE Budget Request			526				

FY 1991: Includes Supplemental of \$54 million.

FY 1992: Current DOE estimate of allocation to Idaho (as of 11/25/91).

DOE ADS Review

The following chart shows the ADSs at Idaho as grouped by the DOE's recent study:

"DOE FY 1993 ADS REVIEW, September 4, 1991" (\$ in Millions)

-----FY 1993-----

Category	# of ADSs	Unvalidated Field Estimate	Program Planning Level	DOE Budget Request
Legally Required	76	531.7	517.6	427.3
DOE Orders	33	96.5	88.9	82.8
Discretionary	18	17.7	17.1	16.1
TOTAL	127	645.9	623.6	526.2

As a result of the ADS review, DOE asserted that \$517.6 million was necessary to meet legal requirements at the PPL level. A total of \$623.6 million was declared to be necessary to fund DOE orders and other desirable discretionary activities.

OMB/Corps Review of Funding Requirements

OMB and staff from the Army Corps of Engineers met with staff and contractors at the Idaho field office from October 23 to October 25. The OMB and Corps staff reviewed all 127 ADSs to determine legal categories and identify legally mandated milestones. In addition, the Corps staff computed cost and overhead estimates derived from 5 project ADSs and 38 program-wide ADSs.

After the meetings, OMB staff contacted representatives from the EPA region and representatives of the Idaho Department of Health and Welfare to discuss the problems at the site and obtain their views on the progress of the DOE cleanup and waste management efforts.

In response to the questionnaire sent by Under Secretary Tuck to all DOE field offices as part of this review:

- DOE staff responded that \$22.0 million of activities identified as mandatory in the ADS study were not in fact mandatory.
- In addition, for Landlord activities, the DOE ADS study had assigned \$22.2 million to the mandatory category. In the questionnaire, DOE staff responded with "category unknown", even though sufficient documentation was available to show that the activities are derived from

DOE orders and good management practices. Based on the review of the documentation, OMB-Corps staff concluded that \$22.2 million was not mandatory.

- In one ADS, \$21.3 million can be associated with an office building and site upgrades that, based on the information provided by the DOE, were considered to be unnecessary to meet RCRA requirements as part of a new TRU storage facility.
- \$61.1 million is needed to replace storage tanks at ICPP. This is required by RCRA, but there was an issue as to whether the Navy should reimburse DOE for these costs.

These factors resulted in a recommendation to take the above items out of the category of legally required activities, which reduce the level of mandatory funding to \$391 million. The items were then recommended for funding at the DOE Request Level. The items in the DOE questionnaire response that were classified as DOE Orders or Discretionary were then also recommended for funding at the DOE Request level, resulting in a total recommended funding level of \$536.1 million.

Note that the Idaho results were presented to the IAG before the decision to separate those DOE orders that were required for health and safety. Also note that the Idaho results, prior to the DOE appeal, dealt only with mandatory activities. All ADSs originally classified as DOE orders or discretionary activities were accepted as such and were recommended for funding at the DOE request level.

Final FY 1993 Budget Allocation

Subsequent to the recommendations to the IAG, OMB and Corps met with representatives from DOE headquarters and from the Idaho Field Office. Also at the meeting were EPA headquarters staff. EPA regional staff attended via conference call during the entire meeting.

Each of the recommendations were discussed and DOE provided supplemental information on all the ADSs that were at issue. As a result of analyzing this new information, it was agreed to shift funds back to the legally required categories in all cases contested by DOE.

In addition, in a final meeting on the outstanding issues, the IAG determined that the current relationship for payment by the Navy was to remain in effect.

As a result of these decisions, the final total for Idaho was brought to \$604.1 million. The final results for Idaho are shown below.

OMB/CORPS ANALYSIS OF DOE ADS REVIEW REPORT
(Based on Program Planning Level)
(\$ in Millions)

DOE ADS Review	DOE Questionnaire Responses ADS and Subactivity		Proposed Funding Level
Legally Required	Legally Required	\$429.2	\$429.2
	DOE Orders	\$ 25.2	\$ 16.0
	Discretionary	\$ 6.5	\$ 5.9
\$517.6	Subtotal	\$460.9	\$451.1
DOE ES&H Orders	Legally Required	\$ 28.4	\$ 28.4
	DOE Orders	\$ 75.0	\$ 70.2
	Discretionary	\$ 3.4	\$ 2.5
\$ 88.9	Subtotal	\$106.8	\$101.1
Discretionary	Legally Required	\$ 26.1	\$ 26.1
	DOE Orders	\$ 20.1	\$ 17.1
	Discretionary	\$ 9.7	\$ 8.7
\$ 17.1	Subtotal	\$ 55.9	\$ 51.9
\$623.6	TOTAL	\$623.6	\$604.1

Cost Review Summary

Eleven project ADSs were originally included in the sample for the cost evaluation at the Idaho site. However, due to a lack of backup data, five project ADS's were analyzed and costs from 38 program-wide ADSs were distributed back to these projects. Costs were separated into direct, overhead, contingency, and escalation for each project. Overhead from program-wide ADSs was distributed back to those projects and was then compared to standard overhead rates used by the Corps of Engineers.

The major conclusion of the cost analysis was that project management and contractor overhead are higher in comparison to DOE direct cost than for comparable projects done by the Corps. Thus both the percentage of overhead and the resulting total costs are greater for DOE projects. Examples are shown below for five of the ADSs reviewed.

Overhead comparison DOE versus Corps for five projects. ADS comparison includes prorated shares of overhead cost from 38 program-wide ADSs.

ADS #	DOE overhead	Corps overhead
ID-40-E1	53%	32%
ID-1201-C1	38%	31%
ID-101-E2	25%	23%
ID-102-E2	34%	25%
ID-1004-C1	32%	25%

Total cost comparison, DOE versus Corps, for several projects:
(\$ in millions)

ADS #	DOE total cost	Corps total cost
ID-40-E1	15.8	10.6
ID-1201-C1	4.7	3.5
ID-101-E2	48.4	44.4
ID-102-E2	4.2	3.8
ID-1004-C1	69.7	41.1
Total for five ADSs	142.8	103.4

For the ADSs included in the analysis, the difference between the DOE estimate and the estimate of comparable Corps projects represents 27 percent of the DOE cost estimate. No reduction in the DOE budget was applied based on the cost analysis. Instead, these findings form the basis of long term recommendations to address overhead and contractor management issues.

Other findings:

1. At Idaho the cost accounting system is well established. Escalation is applied consistently and in accordance with OMB guidance. In addition there is a good historic record of project costs.
2. DOE staff relies primarily on M&O contractors to prepare project specifications and budget estimates. These are further reviewed by independent contractors. Each of these contractor activities adds to overhead costs.
3. All technical and budget review is performed by independent contractors with limited Federal oversight.
4. For most ER activities reviewed the budget estimates are based on excessively conservative assumptions regarding the amount of work necessary.
5. The primary reasons for the differences in the DOE and Corps project costs are:
 - Higher overhead costs in DOE projects; e.g., up to six personnel providing oversight to one drilling crew.
 - Program-wide ADSs contain large amounts of overhead which were distributed back to the DOE projects for the comparison to Corps projects.
 - A large difference, \$16 million, in the amount assumed necessary for contingency in ADS 1004-C1, High Level Waste tank replacement at ICPP.

SUMMARY: NEVADA FIELD OFFICE

Description of the Site:

The Nevada Field Office is responsible for the Nevada Test Site, which is located in south-eastern Nevada about 65 miles north-west of Las Vegas, and seven offsite locations: Amchita Island, AK; Grand Valley and Rifle, CO; Carlsbad and Farmington, NM; Hattiesburg, MS; and Fallon, NV.

Nevada Test Site

The mission of the Nevada Test Site (NTS) is nuclear weapons testing and research and development of a variety of defense and energy-related programs. The NTS covers about 800,000 acres (about 1,350 square miles) and employs about 8,000 people, including 380 employees of the Department of Energy.

The environmental restoration program at the NTS includes 35 ADSs. None of the Nevada Field Office sites are listed on the National Priorities List. However, the Nevada Field Office expects EPA to propose listing of the NTS in the near future. DOE signed an Agreement-in-Principle with the State of Nevada in September 1990, that committed DOE to pursue a variety of monitoring and analysis activities at the NTS.

The major activity undertaken in the environmental restoration program is groundwater characterization at the Nevada Test Site. This activity represents over 50% of the funding for environmental restoration activities at the Nevada Field Office. The groundwater characterization program is a three-phase effort that includes installation of 98 wells to define the presence, magnitude, extent, direction, and rate of groundwater contamination at the NTS. This information will help define cleanup parameters for the site and will be used in the evaluation of remedial alternatives during the RI/FS process and will provide an ongoing groundwater monitoring program for the site. Other activities include several RI/FS activities at several locations and implementation of RCRA closures.

The NTS waste management program handles low-level and TRU-mixed radioactive wastes, mixed radioactive and hazardous wastes, and hazardous wastes. DOE expects to receive wastes from 17 generators in FY 1993, 14 of which are other DOE facilities. A RCRA Part B permit request for storage and disposal has been filed and is under review by the State of Nevada. DOE expects to receive approval of the Part B application in 1992.

The waste management program at NTS includes 14 ADSs. The principal activities are operation and maintenance of storage and disposal facilities, including pit and trench construction and maintenance, waste characterization, and regulatory support activities.

Offsite Locations

The environmental restoration program at the off-site locations includes 12 ADSs. Seven ADSs address payments to States to cover States' costs of CERCLA oversight and other remediation compliance oversight activities. The other 5 ADSs address future remediation actions that require no FY 1993 funding.

The waste management program at the off-site locations includes 2 ADSs. These ADSs address payments to States to cover States' costs of oversight of DOE environmental compliance activities.

Funding History

The following table shows funding levels for environmental restoration and waste management activities of the Nevada Field Office, including outyear projections for the Unvalidated Field Estimate. Funding increased by 83 percent from 1991 to 1992. The FY 1993 Unvalidated Field Estimate and Program Planning Level funding levels represent increases from 1991 of 246 percent and 200 percent, respectively.

NEVADA FIELD OFFICE FUNDING HISTORY
(BA, \$ in Millions)

Funding Level	1991	1992	1993	1994	1995	1996	1997
Actual*	24.1	43.5					
Unvalidated Field Estimate			83.2	128.2	128.1	126.7	114.7
Program Planning Level			71.6				
DOE Request			44.1				

*DOE estimate of allocation to Nevada as of 12/12/91.

DOE ADS Review

The September 4, 1991, DOE study "FY 1993 ADS Review" identified total funding of \$71.6 million as necessary to fund mandatory activities and discretionary activities of the Nevada Field Office (the Program Planning Level). Of this total, the report identified \$22.6 million as necessary to meet all mandatory activities, an additional \$47.2 million to comply with DOE environment, safety, and health (ES&H) Orders, and \$1.8 million to fund discretionary activities.

"DOE FY 1993 ADS Review, September 4, 1991"
(\$ in Millions)

-----FY 1993-----

Category	# of ADSs	Unvalidated Field Estimate	Program Planning Level	DOE Budget Request
Legally Required	18	\$23.5	\$22.6	\$16.1
DOE ES&H Orders	18	57.6	47.2	26.8
Discretionary	28	2.1	1.8	1.3
TOTAL	64	\$83.2	\$71.6	\$44.1

OMB/Corps Review of Funding Requirements

A joint OMB/Corps review team visited the Nevada Field Office to review funding requirements for each ADS and to review DOE responses to the questionnaire. The OMB site visit was on November 21 and 22, and the Corps visit was the week of December 2. In addition, the team conducted briefings with DOE staff and EPA regional and Headquarters staff after the site visit.

OMB staff met with an official of the State of Nevada to discuss regulatory and funding requirements for the Nevada Test Site on December 6, 1991.

DOE responses to the questionnaire significantly revised the categorization of activities in the earlier DOE study. A comparison of the two studies is shown below.

Based on the DOE responses to the questionnaire and other information obtained through the site visit and briefings, the OMB/Corps team recommended to the Interagency Review Group funding of \$49.7 million for the Nevada Field Office in FY 1993. This level would provide the \$17.5 million identified in the questionnaire as necessary to fund all legally required activities and \$2.0 million for DOE ES&H Orders. This level would also provide \$30.2 million to fund discretionary activities.

The OMB/Corps team also noted that much of the increase in funding for the NTS was for activities that could not actually be undertaken in FY 1993 and where funding was premature.

Final FY 1993 Budget Allocation

DOE requested that an additional \$6.2 million above the \$49.7 million recommended by the OMB/Corps team be provided to accelerate activities in the groundwater characterization program. The Interagency Review Group granted the entire \$6.2 million increase.

The President's FY 1993 Budget requests \$55.9 million in FY 1993 for the Nevada Field Office.

OMB/CORPS ANALYSIS OF DOE ADS REVIEW REPORT (Based on Program Planning Level) (\$ in Millions)

DOE ADS Review	DOE Questionnaire Responses ADS and Subactivity	Proposed Funding Level
Legally Required	Legally Required \$15.8 DOE ES&H Orders 0.7 DOE Manage/Plan Orders 0.5 Discretionary 5.6	\$15.8 0.7 0.5 4.1
\$22.6	Subtotal \$22.6	\$21.1
DOE ES&H Orders	Legally Required \$1.8 DOE ES&H Orders 1.9 Discretionary 43.5	\$1.8 1.9 29.8
\$47.2	Subtotal \$47.2	\$33.5
Discretionary \$1.8	Discretionary \$1.8	\$1.3
\$71.6	TOTAL \$71.6	\$55.9

Cost Review Study

The Corps review team conducted an in-depth review of 5 ADSs, including 3 ADSs for comparison of DOE costs to comparable Corps project costs, and 2 ADSs focusing on cost estimation procedures used by the Nevada Field Office. This review covered both waste management and environmental restoration activities that represented about 70% of funding for the Nevada Field Office.

The major findings were:

- DOE contracting procedures include subcontracting, even subcontracting among subcontractors, as a common practice. In such circumstances, total contractor overhead charged to a project is likely to be high.
- Several ADSs, including the Pu contaminated soil cleanup and closure plant implementation, did not have cost back-up, and ADSs generally were lacking scope, schedule and cost information.
- Several ADSs contained funds for work that is complete or rescheduled to future years, e.g., funding requested for RCRA closure activities at the Nevada Test Site had no clear relationship to the current closure schedule.

SUMMARY: OAK RIDGE FIELD OFFICE

Description of the Site:

The Oak Ridge Field Office is responsible for seven major facilities and programs: Oak Ridge Gaseous Diffusion Plant, Oak Ridge National Laboratory, Y-12 Plant, Paducah Gaseous Diffusion Plant, Portsmouth Gaseous Diffusion Plant, the Weldon Spring Site Remedial Action Project, and the Formerly Utilized Sites Remedial Action Program. The environmental restoration and waste management programs include 251 ADSs funded by the ERWM Program and an additional 90 ADSs funded by the uranium enrichment (URE) program. A total of 506 ERWM Program subactivities and 195 URE subactivities were reviewed. Environmental restoration and waste management activities of the Oak Ridge Field Office are required principally by RCRA, CERCLA, CAA, CWA, TSCA, and State statutes and regulations, further defined for each site in permits, compliance agreements, Consent Orders, and DOE Orders.

Oak Ridge Gaseous Diffusion Plant (K-25)

The K-25 plant occupies a 1,500 acre area adjacent to the Clinch River, approximately 13 miles west of downtown Oak Ridge, Tennessee. The uranium enrichment process at K-25 was shutdown in 1987. The K-25 site now serves as the location of central waste treatment and storage facilities, as well as serving as a center for applied technology. K-25 is part of the Oak Ridge Reservation, which was listed on the National Priorities List in 1989. The environmental restoration program operates in compliance with the FFA under RCRA and CERCLA for the Oak Ridge Reservation, which was signed by DOE, EPA and the Tennessee Department of Environment in January 1992. One hundred and four solid waste management units (SWMUs) have been identified at the K-25 site. Facilities and sites containing hazardous materials and wastes include burial grounds, process facilities, storage facilities, underground tanks, surface impoundments, treatment facilities, process lines, and accumulation areas. Offsite surface waters have been contaminated with radionuclides, metals, and organic compounds. Major environmental restoration activities include completing RA/RI reports, PCB gasket removal, and operation of a multiplant waste storage program. The waste management program handles asbestos insulation, RCRA oils and chemicals, PCBs, special nuclear materials, and residual radionuclides. The program operates a number of facilities: the Central Neutralization Facility; the K-1203 Sewage Treatment Plant; the K-1232 Treatment Facility; the TSCA incinerator for mixed and hazardous wastes; and the Oak Ridge Filter Test Facility. Other principle waste management operations include performance assessments for disposal sites, design of low-level waste disposal facilities, upgrade of the Central Neutralization Facility, and development and implementation of a waste minimization plan.

Oak Ridge National Laboratory (ORNL)

ORNL covers approximately 2,900 acres in Melton Valley and Bethel Valley, 10 miles southwest of downtown Oak Ridge, Tennessee. ORNL's mission is to conduct applied research and engineering development in support of DOE programs in energy technologies and to perform basic scientific research in selected areas of the physical and life sciences. The environmental restoration program is conducted under the FFA under RCRA and CERCLA for the Oak Ridge Reservation and an FFA under the Clean Water Act signed by DOE and EPA in 1986. Past research and development and waste management activities at ORNL have produced approximately 300 RCRA/CERCLA units, divided into 20 Waste Area Groups (WAGs). Two hundred twenty-two of these units included within 12 of the WAGs will potentially require remediation.

Decontamination and decommissioning activities encompass a variety of facilities ranging from abandoned waste storage tanks to large experimental reactors. The waste management program handles liquid and solid low-level and TRU radioactive waste, organic solvents, corrosive chemicals, PCBs, and heavy metals. Principle activities include routine waste collection, transfer, storage, and treatment, operation of the Nonradiological Wastewater Treatment Plant, and waste minimization.

Y-12 Plant

The Oak Ridge Y-12 plant occupies an 811 acre site in the Bear Creek Valley approximately 2 miles from downtown Oak Ridge, Tennessee. Built in 1943 as part of the Manhattan Project, the Y-12 plant's current role is manufacturing and developmental engineering. The environmental restoration program is conducted under the Oak Ridge Reservation FFA under RCRA and CERCLA, and FFCAs under the Clean Air and Clean Water Acts signed by DOE and EPA in 1982 and 1985, respectively. Contaminated sites in need of environmental restoration include past-practice waste disposal sites, waste storage tanks, spill sites, and contaminated inactive facilities. Additionally, mercury is present onsite and offsite in the East Fork Poplar Creek floodplain soils and sediments. Principle activities include remedial design of groundwater treatment facilities, several RI/FS activities, and RCRA closures. The waste management program handles hazardous materials, low-level radioactive material, and mixed wastes resulting mainly from the weapons production processes. Some of the wastes are highly reactive (pyrophoric and pyrotechnic). Principle activities include operation of the reactive waste treatment facility and various storage and disposal facilities, waste minimization, and development of mixed waste treatment methods.

Paducah Gaseous Diffusion Plant

The Paducah Gaseous Diffusion Plant, located 15 miles west of Paducah, Kentucky, is used for the separation of uranium isotopes through gaseous diffusion. The site covers 750 acres, including 74 acres of process buildings. The environmental restoration program is conducted under an Administrative Consent Order under RCRA and CERCLA signed by EPA and DOE in 1988 as well as KPDES and HSWA permits. An estimated 144 SWMUs have been identified as needing site characterization.

Groundwater contamination exists both onsite and offsite. The major known contaminants are technetium-99, trichloroethylene in the groundwater, and PCBs. Environmental restoration activities include ongoing HSWA RFI/CMS/CMI work at several SWMUs. Waste management activities include construction of a mixed waste storage facility, a new solid waste landfill, a PCB decontamination facility, a sludge volume reducer, as well as ongoing waste sampling and characterization, packaging, transportation, storage, and onsite and offsite disposal.

Portsmouth Gaseous Diffusion Plant

The Portsmouth Gaseous Diffusion Plant, located approximately 20 miles north of Portsmouth, Ohio is also used for the separation of uranium isotopes through gaseous diffusion. The site covers 3,700 acres, including 93 acres for the process building. Environmental restoration activities are conducted under an Administrative Consent Order under RCRA and CERCLA signed by DOE and EPA in 1989, an Ohio Consent Decree under RCRA signed by DOE and the State of Ohio in 1989, and an FFCA under RCRA signed by DOE and EPA in 1988. Approximately 84 SWMUs have been identified as needing site characterization. Groundwater contamination is known to exist. Major contaminants include technetium-99, trichloroethylene, and PCBs. Contamination plumes have been identified and are currently contained within the site boundary. Environmental restoration activities include RFI/CMS studies, RCRA closures, and interim remedial measures as part of a groundwater protection plan. Waste management activities include construction of a mixed waste storage and staging facility, engineering design of a radioactive scrap metal storage facility, and operation of pollution abatement, effluent treatment, and waste treatment facilities and processes.

Weldon Spring Site Remedial Action Project

The Weldon Spring site, located on 229 acres about 30 miles west of St. Louis, Missouri, was used by the Army as an ordnance works in the 1940s; then in the 1950s and 1960s the Atomic Energy Commission used Weldon Spring for the processing of uranium and thorium. The site is currently on the EPA National Priorities List, and DOE is conducting a comprehensive remedial action program managed by the environmental restoration program. Activities at the site are conducted under an FFCA under CERCLA signed by DOE and EPA in 1986. Areas to be remediated include: the quarry, a 9-acre site containing 95,000 cubic yards of radioactively contaminated soil and rubble and 3,000,000 gallons of radioactively or chemically contaminated water; raffinate pits, consisting of 4 waste lagoons containing 250,000 cubic yards of raffinate sludges and 57 million gallons of radioactive or chemically contaminated water; the chemical plant, consisting of 44 buildings and other structures and 470,000 cubic yards of contaminated soil and building material; vicinity properties containing approximately 25,000 cubic yards of contaminated soil; and nitroaromatic and radioactively contaminated groundwater at the quarry and the chemical plant.

Formerly Utilized Sites Remedial Action Program (FUSRAP)

FUSRAP presently includes 33 sites in 13 States. Of these, 28 are Manhattan Engineer District or Atomic Energy Commission sites that are included in FUSRAP under authority of the Atomic Energy Act of 1954 as amended. The other five sites were added by Congressional action in 1984 and 1985. FUSRAP is operated by the environmental restoration program. Six of the FUSRAP sites are listed on the EPA's National Priorities List. DOE has signed FFAs under CERCLA for the Wayne and Maywood NJ sites and an FFA under RCRA and CERCLA for the St. Louis and Hazelwood, MO, sites. Environmental restoration activities are as follows: 1) identify and assess sites to determine whether further decontamination and/or control is needed; 2) decontaminate and/or apply controls to the sites to permit conformance with current applicable guidelines; and 3) dispose of and/or stabilize all generated residues in a radiologically and environmentally acceptable manner.

Funding History

The following table shows funding levels for environmental restoration and waste management activities of Oak Ridge Field Office facilities and programs. Oak Ridge Field Office funding grew by 35 percent from FY 1991 to FY 1992. The three DOE funding levels for FY 1993 suggest further growth from 16 percent in the DOE request to OMB, to as much as 74 percent in the Unvalidated Field Estimate.

OAK RIDGE FIELD OFFICE FUNDING HISTORY
(BA, \$ in Millions)

FUNDING LEVEL	1991	1992	1993	1994	1995	1996	1997
Actual*	492.1	664.0					
Unvalidated Field Estimate			1156.7	1337.9	1523.6	1582.1	1347.8
Program Planning Level**			809.7				
DOE Budget Request to OMB			771.6				

* DOE estimate of allocation to Oak Ridge as of 12/6/91.

** PPL only available for the ERWM Program, not for activities funded from the uranium enrichment account.

DOE ADS Review

The September 4, 1991, DOE study "FY 1993 ADS Review" identified a total of \$809.7 million of ERWM funding as necessary to fund legal requirements, DOE ES&H Orders, and discretionary activities of the Oak Ridge Field Office (the Program Planning Level). Of this total, the report identified \$712.4 million as needed to meet all legal requirements, an additional \$69.6 million to comply with DOE ES&H Orders, and \$27.7 million to fund discretionary activities. The DOE study only considered environmental restoration and waste management activities funded by the ERWM Program; activities funded from the uranium enrichment account were not included.

"DOE FY 1993 ADS Review, September 4, 1991" (\$ in Millions)

——FY 1993——

Category	# of ADSs	Unvalidated Field Estimate	Program Planning Level	DOE Budget Request to OMB
Legally Required	142	\$803.1	\$712.4	\$522.2
DOE ES&H Orders	27	84.0	69.6	53.5
Discretionary	82	30.1	27.7	22.8
TOTAL	251	\$917.1	\$809.7	\$598.5

OMB/Corps Review of Funding Requirements

A joint OMB/Corps review team met with staff and contractors at the Oak Ridge Field Office November 4-8, 1991, to review DOE responses to the questionnaire sent out to refine the information in the earlier DOE study. The team reviewed legal drivers, legally-mandated milestones, and backup information for 212 of the 251 ERWM ADSs. Those ADSs not reviewed had zero dollars budgeted in FY 1993. In addition, the OMB team reviewed the 90 ADSs for environmental restoration and waste management activities funded by the URE Program. A total of 506 ERWM Program subactivities and 195 URE subactivities were reviewed.

In addition, the team met with DOE staff both before and after the site visit, and met with EPA Headquarters and regional staff. OMB staff spoke with representatives of the Tennessee Department of Environment and Conservation to discuss the problems at Oak Ridge Field Office sites and obtain their views on the progress of the DOE cleanup and waste management efforts.

DOE responses to the questionnaire significantly revised the categorization of activities presented in the earlier DOE study. The table below compares the September 4, 1991, DOE study to DOE responses to the questionnaire.

Of the 506 ERWM Program subactivities at the Oak Ridge Field Office, the DOE questionnaire response identified 330 subactivities as legally-required. Ninety-five ERWM subactivities were identified as required by DOE Orders, and 81 ERWM subactivities were identified as discretionary. ERWM subactivities identified as legally-required were recommended for funding at the PPL level. All other ERWM subactivities were recommended for funding at the level of the DOE request to OMB. Adjustments were made for subactivities for which DOE re-estimated the funds necessary to meet requirements; ADSs found to have inadequate supporting justification; and for recommended shifts in the allocation of cost sharing for uranium enrichment cleanup from ERWM to URE. A total of \$27 million was shifted from ERWM to URE, however, there was no net reduction in funding for uranium enrichment cleanup activities as a result of this shift. Based on this analysis, the OMB/Corps review team recommended to the Interagency Group that the Oak Ridge Field Office receive \$664 million for ERWM Program activities in FY 1993. For URE activities, the recommended FY 1993 funding level was \$216.9 million.

Final FY 1993 Budget Allocation

After the IAG meeting, DOE proposed to re-classify 17 ERWM subactivities as legally-required or required by DOE ES&H Orders, and therefore to fund these subactivities at the PPL level. The Interagency Group granted the entire increase. As a result, the final recommended funding level for environmental restoration and waste management activities at the Oak Ridge Field Office is \$682.8 million for the ERWM Program and \$216.9 million for the URE Program.

OMB/CORPS ANALYSIS OF DOE ADS REVIEW REPORT
(Based on Program Planning Level)
(\$ in Millions)

DOE ADS Review	DOE Questionnaire Response		Proposed Funding Level
Legally Required \$712.4	Legally Required	\$565.4	\$514.2*
	DOE ES&H Orders	16.7	15.5*
	DOE Management Orders	88.9	49.6
	Discretionary	41.4	23.6
	Subtotal	\$712.4	\$602.9
DOE ES&H Orders \$69.6	Legally Required	\$8.2	\$ 6.8*
	DOE ES&H Orders	11.5	11.5
	DOE Management Orders	49.0	31.5
	Discretionary	0.9	0.4
	Subtotal	\$ 69.6	\$50.2
Discretionary \$27.7	Legally Required	\$6.4	\$16.1
	DOE ES&H Orders	0	0
	DOE Management Orders	4.8	0.9
	Discretionary	16.6	12.7
	Subtotal	\$ 27.7	\$29.7
\$809.7	Total	\$809.7	\$682.8

*The difference between the PPL and the proposed funding level is due to two factors: revised Field Office cost estimates for certain ADSs; and re-assignment of some ADSs to the uranium enrichment account.

Cost Review Summary

The Corps review team conducted an in-depth review of 3 ADSs focusing on cost and overhead procedures. In a separate analysis, 25 ADSs were evaluated for the reasonableness of the cost estimates. For 17 of them, the ADSs were found to include unreasonable estimates.

A major finding of the cost analysis is that overhead rates are higher in comparison to DOE direct costs than the same overhead categories for comparable Corps projects. DOE costs for project management, program direction, and contractor overhead were estimated to exceed Corps costs for comparable activities by 140 percent. DOE project costs were estimated to exceed Corps costs for comparable activities by 27 percent.

Several weaknesses were identified in the cost estimating and accounting processes for ERWM activities. These weaknesses included: use of incorrect rates and factors;

incorrect calculation of rates and factors; high design and construction management costs; failure to take economies of scale into account for projects involving repetitive activities; and incomplete or nonexistent documentation of the cost basis for certain activities. In addition, accounting practices were not applied consistently from site to site.

No reduction in recommended funding level was applied based on the cost analysis. Instead, the findings on cost estimates formed the basis of long-term recommendations to address overhead and contractor management issues. These recommendations are presented in Chapter Five.

SUMMARY: RICHLAND FIELD OFFICE

Description of the Site

The Hanford site, administered by the Richland field office, encompasses 560 square miles of semiarid desert in southeastern Washington State. Located along the Columbia River, the area is immediately to the north of Richland, Kennewick and Pasco, which have a combined population of 100,000. Approximately 15,000 personnel work at the site. Since World War II, the site has been used principally to produce plutonium for nuclear weapons. Recently, priorities have shifted to managing the wastes generated by past activities and long-term environmental restoration. The site has been placed on the National Priorities List and contains more than 1,100 waste sites grouped into 78 operable units in four general areas.

Among the more than 1,100 waste sites that require remediation are 177 underground storage tanks - 149 single shell tanks (SSTs) and 28 double shell tanks (DSTs) - containing an assortment of highly radioactive materials, liquid solvents, acids and other hazardous wastes. Sixty-six (66) SSTs have leaked about 750,000 gallons of radioactive waste containing 102,000 curies into the surrounding soil. (This figure does not include a large quantity of cooling water that leaked from Tank 105-A.) In total, the tanks contain 59 million gallons of liquid and solid waste. Through the addition of chemicals to the tanks and the mixing of wastes among the tanks over the years, potential safety problems have developed in 53 of the tanks. Ensuring the safety of these tanks is a key site priority.

Over the period the site was in operation, soils and groundwater were contaminated with an estimated 444 billion gallons of low level and mixed wastes. Engineering estimates have put the volume of contaminated soil, contaminated with toxic chemicals, uranium, plutonium mercury and other heavy metals, between 30 million and 50 million cubic yards for the 100 and 300 areas alone.. Additionally, 875,105 cubic yards of solid waste are buried or stored in drums on the surface. A breakdown of this 875,105 cubic yards of waste by type is as follows:

Hanford Solid Waste Inventory and Generation Rates

(Cu. Yds.)	High Level TRU	Low Level	LL-Mixed	Other	Total
Inventory	20,514	629,743	35,206	189,642	875,105
Generation Rate (yr.)	281	10,504	549	N/A	11,334

Hanford also serves as a depository for the center sections of decommissioned nuclear submarines, including the defueled submarine reactor. There are currently 21 of

these nuclear submarine reactor sections on site and it is expected that Hanford will eventually hold 100.

In the northern section of the site along the Columbia River, stand nine surplus nuclear reactors that formerly produced weapons grade nuclear materials. When operational, eight of the reactors used Columbia River water for once-through cooling. The ninth used recirculating water cooling and was built as a dual purpose reactor to produce plutonium and provide low-pressure steam for a nearby 860,000 kilowatt Washington Public Power Supply System generating plant. Nearby one of the reactors are 2,100 metric tons of irradiated fuel stored in pools of water.

Hanford contains about 60 percent of all DOE high-level waste. This is by far the largest inventory of high-level nuclear waste in the Nation.

Funding History

Hanford funding increased 17 percent from FY 1991 to FY 1992 as shown in the following table. At the end of FY 1991, Hanford had about \$308 million in obligated but uncosted carryover funds from prior years. For FY 1993, three funding levels were developed by DOE. As can be seen, the increase over FY 1992 ranges from 17 percent to 63 percent depending on the funding level. The Unvalidated Field Estimate projection for FY 1997 more than doubles from FY 1992.

Richland/Hanford Funding History
(\$ in Millions)

Funding Level	1991	1992	1993	1994	1995	1996	1997
Actual	797.2	932.7					
Unvalidated Field Est. vs. FY 1992	797.2	932.7	1,518.3 +63%	1,750.4	1,967.2	2,162.1	2,175.3
Program Planning Level vs. FY 1992			1,272.4 +36%				
DOE Budget Request vs. FY 1992			1,093.1 +17%				

Legal Requirements, DOE Orders and Discretionary Activities

The principal legal driver at the site is the Federal Facility Agreement and Consent Order, which is referred to as the Tri-Party Agreement (TPA). The TPA, signed in 5/89 by DOE, EPA, and the State of Washington, and amended in 1990, is a plan and schedule for bringing the site into compliance with RCRA, CERCLA, and the associated regulations. Other regulatory drivers include RCRA, CERCLA, TSCA, OSHA, NEPA, the Clean Air and Water Acts, and the Atomic Energy Act. Washington State hazardous

waste regulations are also an important driver. In addition, DOE orders have a major impact on the way the site is managed and the methods under which remediation will occur.

DOE ADS Review

DOE's ADS Review Report of 9/4/91 examined the legal drivers for the Richland site. It categorized funding either as "Legally Required", non-legally driven "DOE Environment, Safety, and Health (ES&H) Orders", or as "Discretionary" at the ADS level. The following table summarizes for each funding level the amount of funding for each category.

"DOE FY 1993 ADS Review, September 4, 1991"
(\$ in Millions)

Category	Unvalidated Field Estimate	Program Planning Level	DOE Budget Request
Legally Required	\$1,029.6	\$ 820.2	\$ 722.5
DOE ES&H Orders	409.7	385.3	327.3
Discretionary	79.0	66.9	43.2
Total	\$1,518.3	\$1,272.4	\$1,093.1

The table on the following page displays a breakdown of funds by major program for each funding level and the number of ADSs that have funding for FY 1993.

Funding by Major Program
(\$ in Millions)

DOE Program	# of ADSs Req. \$	Unvali-dated Field Estimate	PPL Level	DOE Budget Request
Environmental Restoration	49	\$ 236.6	\$ 220.0	\$ 167.5
Waste Management	129	\$1,186.3	\$ 986.9	\$ 853.0
Landlord	24	\$ 92.9	\$ 63.1	\$ 70.1
Corrective Action	2	\$ 2.5	\$ 2.5	\$ 2.5
Total	204	\$1,518.3	\$1,272.4	\$1,093.1

OMB/Corps Review of Funding Requirements

An OMB team with personnel from the U.S. Army Corps of Engineers (Corps) examined the funding level needed to meet legal requirements, all DOE ES&H and all other DOE management orders, and priority discretionary subactivities for each of 507 ADS subactivities within the 204 Activity Data Sheets (ADS) for which funding was requested in FY 1993. This was done for the Unvalidated Field Estimate level of \$1,518.3 million. This funding level was the only one for which ADS subactivity cost and legal driver information were available at the site. The other funding levels were not supported with such information at the ADS subactivity level.

The OMB/Corps review of Richland ADSs used a similar classification structure as the DOE ADS Review. However, in contrast with the DOE ADS Review, the OMB/Corps review classified legal drivers for each individual subactivity within each ADS. This greater level of detail resulted in a more accurate classification of the site's funding requirements.

The OMB/Corps team visited the site on November 11 through November 15, 1991 to review in detail with site personnel the legal drivers and supporting cost backup for each subactivity within each ADS. The team met with EPA Headquarters and Region 10 staff on November 21, 1991 and with Washington State regulators on November 27, 1991. The Corps also completed a detailed review of the cost backup for selected ADSs. In this way, a reasonably comprehensive review of Richland's requirements, priorities, cost backup, schedule, overhead, and cost estimating methods was achieved. The OMB/Corps team used, when possible, the questionnaire responses that were provided by site personnel. However, while some of the questionnaires had subactivity detail broken out with documentation, in many instances the questionnaire responses were made at the ADS level. Since the OMB/Corps team review was at the subactivity level, considerable supplementary and additional subactivity level

information was needed, including legal driver documentation. The subactivity detail was used for the OMB/Corps classifications that are shown below.

Results of the analysis of legal requirements is shown below.

**Analysis of Legally Required Funding
for Unvalidated Field Estimate Funding Level
(\$ in Millions)**

Category	ADS Review		Classification After Interagency Review	
	Funding	Percent	Funding	Percent
Legally Required in FY 1993	\$ 805.7 ¹	62.2	\$692.1 ¹	53.5
DOE Orders in FY 1993	409.7	31.7	406.1	31.4
Discretionary in FY 1993	79.0	6.1	75.4	5.8
Undocumented in FY 1993	0	0	8.6	0.6
Funding After FY 1993	0	0	112.2	8.7
Total	\$1,294.4¹	100.0	\$1,294.4¹	100.0

Reasons for the differences are summarized in the following:

- The DOE Review classified an entire ADS as legally required when the majority of the funding in the ADS was legally required whereas the OMB/Corps team reviewed each ADS subactivity legal driver and many were found to be driven by DOE orders or were discretionary or undocumented.
- The OMB/Corps review determined that \$112.2 million classified by DOE as needed in FY 1993 was needed after FY 1993 based on information provided by DOE site personnel. Refer to table on following page for examples.

¹ The amount shown does not include \$223.9 million for the Hanford Waste Vitrification Plant (HWVP) that was included in the Unvalidated Field Estimate but not in the initial OMB/Corps review since it was under renegotiation between DOE and Washington State regulators at the time of the site review.

- DOE included both ADSs for program and project management and the ADS subactivities as legally required even though the drivers are mainly DOE management orders. DOE classified funding related to any management ADS that could be associated with completing legally required activities as also legally required. OMB/Corps classified these ADSs and ADS subactivities as required by DOE orders.
- DOE and OMB/Corps totals for discretionary are nearly equal but the ADSs and ADS subactivities are totally different as can be seen in the table entitled, "OMB/Corps Analysis of DOE ADS Review Report for Unvalidated Field Estimates Funding Levels", under discretionary. OMB/Corps classified most of DOE's discretionary (\$61.2 million) as legally required because legal drivers existed. Conversely, many ADS subactivities classified by DOE as legally required or required by an order were not legally required based on information provided by DOE site personnel and thus were classified as discretionary. For examples refer to table on the following page.
- The OMB/Corps review also identified \$8.6 million of undocumented funding requests.

Examples of Funding Required After FY 1993
(\$ in Millions)

ADS No.	Activity/Subactivity	FY 1993 (\$ in M)	Reason
5178	SST Tank Simulation Facility Design	\$ 3.4	Design scheduled to begin October 1994.
5176	New Risers for SST Tanks	\$ 1.1	SST sampling not far enough along to require these risers in FY 1993.
5202	Technical Support to RA	\$ 3.2	Funding in excess of that required in FY 1993 to meet milestone.

Examples of Discretionary ADS Subactivities
(\$ in Millions)

ADS No.	Activity/Subactivity	FY 1993 (\$ in M)	Reason
9010	Technical Support to DOE-HQ	\$2.3	Funding to support DOE-HQ programs not specifically related to Hanford.
1021	Railroad Upgrade New Rails	\$1.0	FRA inspection assessed the track as sound.
1023	Build New 200 Fabrication Shop	\$1.1	No legal requirement to build a new Fab shop; current facilities are adequate.
1010	Demolition of "Excess" Buildings	\$2.0	Most buildings are serviceable and can be used/adapted in lieu of new construction.
8214/8219	Hanford Integrated Planning	\$6.8	No legal driver, and staffing levels questionable.
1038	Outyear General Plant Projects	\$2.8	No legal requirement; no justification was provided.
1037	Core Outyear General Plant Projects	\$5.7	No legal requirement; no justification was provided.
9098	RL Reserve and WHC Site Impact Funding	\$7.5	Discretionary overhead contingency fund.
9098	Waste Operations General Support Capital Equipment	\$1.3	Not legally required; improvements and additions to equipment not associated with any project.
5176	Sampling Methods	\$1.8	Expected to be completed with FY 1992 funds.

The following table contains a comparison of each DOE classification by category arrayed by the OMB/Corps classification therein.

**OMB/Corps Analysis of DOE ADS Review Report
for Unvalidated Field Estimates Funding Levels
(\$ in Millions)**

DOE ADS Review	Classification After Interagency Review	FY 1993	After FY93	Total
Legally Required ²	Legally Required ²	\$571.8	\$35.7	\$607.5
	DOE ES&H Orders	61.7	10.5	72.2
	DOE Management Orders	43.8	0.2	44.0
	Discretionary	53.0	21.0	74.0
	No Documentation	8.0	0.0	8.0
\$ 805.7	Subtotal	\$738.3	\$67.4	\$805.7
DOE ES&H Orders	Legally Required	\$ 73.1	\$ 0.0	\$ 73.1
	DOE ES&H Orders	268.5	1.5	270.0
	DOE Management Orders	30.0	1.3	31.3
	Discretionary	12.8	21.9	34.7
	No Documentation	0.6	0.0	0.6
\$ 409.7	Subtotal	\$385.0	\$ 24.7	\$409.7
Discretionary	Legally Required	\$ 47.2	\$ 14.0	\$ 61.2
	DOE ES&H Orders	2.1	0.0	2.1
	DOE Management Orders	0.0	0.0	0.0
	Discretionary	9.6	6.1	15.7
	No Documentation	0.0	0.0	0.0
\$ 79.0	Subtotal	\$58.9	\$20.1	\$79.0
Total		\$1,182.2	\$112.2	\$1,294.4

² The amount shown excludes \$223.9 million for the HWVP since it was under renegotiation at the time of the initial OMB/Corps review.

In sum, the OMB/Corps analysis disclosed that funding all legal requirements, all DOE ES&H and management orders, and priority discretionary needs required \$1,146 million (without HWVP), or about the same as DOE's PPL level (without the HWVP). This level and the OMB/Corps findings were presented to the Inter Agency Group (IAG) on 12/5/91.

Final FY 1993 Budget Allocation

DOE and EPA were provided with the findings of the OMB/Corps study as presented on 12/5/91 to the IAG. Based upon DOE and EPA provided documentation, the funding level was increased from \$1,146 million to \$1,328 million to ensure that all legal, DOE orders and priority discretionary needs were fully funded in FY 1993.

The reasons for the increase over the \$1,146 million level include:

- As a result of a renegotiation with EPA and Washington State regulators, DOE decided to proceed with the HWVP construction TPA milestone date of April 1992 and to retain the agreement's hot start milestone for the HWVP of 1999. Initial construction would involve site preparation and the storage facility. In addition, over the next two years a redefinition of the HWVP and its related systems to assure a long-term high level waste stream for vitrification will be completed. The method by which waste streams will be reprocessed and the technical difficulties encountered at Savannah River will need to be resolved and HWVP design finalized based on the results. DOE requested \$125 million in FY 1993 to meet all these requirements in FY 1993, based on the outcome of its negotiations with the regulators. This amount has been included in the Richland budget request for FY 1993.
- In the appeal process, DOE requested an additional \$60.7 million of funding for ADSs for Fast Flux Test Facility safe shutdown, dose reconstruction, "down winder" studies and site litigation expenses. Due to an oversight, these were not previously brought to the attention of the OMB/Corps team. In addition, DOE provided documentation that resulted in changes to several OMB/Corps classifications from discretionary to DOE orders or legally required. Also, DOE revised its cost estimates for several ADSs reducing estimated funding needs by \$10.1 million. Altogether, the changes resulted in a net addition of \$57.0 million. The following table displays the legal classification of the initial and final recommended funding levels.

FINAL FY 1993 FUNDING LEVEL
(\$ in Millions)

Category	12/5/91 IAG Funding Recommendation	Funding Based on Agency Appeals
• Legally Required in FY 1993.	\$ 692.1	\$ 889.2 ¹
• DOE Orders Required in FY 1993.	406.1	397.1
• Discretionary.	50.0	41.6
Total FY 1993	\$1,146.0²	\$1,328.0

In sum, all legal, DOE order and priority FY 1993 discretionary activities will be met at Richland with the \$1,328 million funding in FY 1993 which is an increase of 42.4 percent over FY 1992 level of \$932.7 million. It is important to note as well that OMB/Corps did not reduce funding for ADSs that included the inflated cost estimates found in the Corp's review of selected ADS cost backup. DOE needs to review this finding and modify the appropriate cost estimation procedures to assure that it does not occur in the future. The resulting surplus funds should be used to meet priority, legal, or management requirements in future years. A more detailed study of overhead/indirect costs needs to be completed and action taken where excessive costs exist. Finally, as of the end of FY 1991, Hanford had about \$308 million in obligated but uncoded funds carried over from prior years. These year-end fund balances are increasing each year and this may indicate prior year funds are no longer needed for the purpose intended. DOE indicates that these balances are the result of workscope extending into FY 1992. A thorough review of extent to which these balances are legally required needs to be completed by DOE.

¹ Funding was increased from the 12/5/91 funding recommendation level by adding \$125 million for HWVP; \$45 million for the FFTF; and \$27.1 million for other ADS.

² The total shown was presented to the IAG on 12/5/91. The category detail exceeds the total by \$2.2 million because of rounding discrepancies. The difference was resolved in the appeals adjustment.

Cost Review Summary

Other OMB/Corps Team Findings Presented to IAG on 12/5/91

The review of the Richland site by the OMB/Corps team included an examination for selected ADSs of the cost estimates that the site used to justify its budget request. This portion of the review was limited to determining whether detailed cost estimates existed, and whether assumptions for labor rates, materials, escalation, contingencies, and overhead were reasonable. The OMB/Corps team did not attempt to determine whether the amount of labor or materials for each project was justified. The findings of the detailed cost review as presented to the IAG on 12/5/91 were as follows:

Over-Estimated Costs Within Some ADSs

In various instances cost estimates appeared excessive. These included:

- **Labor Costs.** The method used by Kaiser Engineers, Hanford (KEH) for estimating manhour labor costs may overestimate labor costs. Kaiser bases its estimates for all labor on the primary craft rate in the crew rather than the actual man-hour rate for each craft.
- **Groundwater Monitoring Well Installation Costs.** These costs appear high. ADS funding costs per non-hazardous/non-radioactive well installed were roughly 64 percent higher than costs incurred by the Corps to install comparable wells at a hazardous waste site.
- **Waste Disposal Costs.** Compared with a contract the Corps has with Envirocare of Utah for NORM waste disposal, low level waste disposal at Hanford is roughly 3-4 times more expensive. Although the materials to be disposed are different, this large disparity suggests the need for a more detailed cost analysis.

Possible Lack of Budgetary Control to Assure Priority for Legal Requirements

Based on information provided at the site, DOE may lack a completely adequate budgetary control system for all activities to assure that legal and DOE order requirements are given high priority for available funding, compared to discretionary needs. Funds may not be devoted as necessary to meet the legal requirements. A budget tracking system that would control funding at the ADS subactivity level and assure that the funding goes first to meeting legal and DOE ES&H and management order requirements and priority discretionary activities is needed.

Overhead/Indirect Cost Analysis

The team analyzed direct costs, indirect costs, and site-wide costs. Site-wide project management, program direction, base services and support ADSs were categorized as site-wide ADSs. A limited sampling of the remaining ADSs was done to determine what portion of the budget supports direct costs and indirect costs. The analysis in this report reflects the FY 1993 funding level of \$1,328 million.¹

Based on the analysis of the \$1,328 million level, 19.2 percent (\$255 million) was identified as site-wide cost, 52.1 percent (\$692 million) as direct cost and 28.7 percent (\$381 million) as indirect cost. On average, for every dollar budgeted at Richland on direct materials and labor for environmental remediation, at least another \$0.92 is budgeted on site-wide and indirect costs.

It appears that additional indirect costs may be included in project specific ADSs. For example, ADSs 416 Purex Operations, and 435 PFP Operations contained subactivities described as support assessments, and security. Due to insufficient information, it was not possible to determine if these subactivities were indirect costs, and therefore it was assumed they were direct costs. For such reasons, site-wide and indirect costs are probably understated while these costs may actually be significantly higher than necessary. Accordingly, further study is necessary to make a final determination.

Long-Term Remediation Challenges

Hanford is clearly the largest superfund site in the Nation. To address the more than 1100 past waste sites in the 78 operable units (OUs), the TPA established an ambitious schedule that requires DOE to submit work plans for RI/FS studies of six of the OUs each year. As each study will take at least several years, the number of ongoing studies will increase quickly. By the late 1990's, DOE-Richland will be required to have up to 49 separate RI/FS studies underway simultaneously to meet the TPA schedule.

DOE believes that CERCLA requires, for each OU, that it award a cleanup contract within 15 months of the completion of the RI/FS. Under this interpretation of the statute, the projected number of remedial actions would escalate rapidly as DOE completes the growing number of RI/FS studies. DOE would need to perform substantial remedial work on up to 60 OUs simultaneously in the first decade of the 2000's.

It will not be easy to coordinate this enormous effort. While many of the OUs pose similar environmental restoration problems, the effectiveness of the various strategies for performing much of this work is unknown. On-site personnel are concerned that much of the analysis

¹The Corps of Engineers supplemental report also includes a baseline analysis at the unvalidated field estimate level of \$1,518.3 million, which was all that was available at the time the Corps did their analysis.

and remediation will have to be performed simultaneously -- increasing the consequences of any errors in approach, technology or logistics.

SUMMARY: ROCKY FLATS PLANT

Description of the Site:

The primary mission of the Rocky Flats Plant is to manufacture components for nuclear weapons. Additional activities include reprocessing plutonium from dismantled nuclear weapons and environmental restoration and waste management activities. The site covers an area of about 10 square miles located about 16 miles northwest of Denver. About 7,000 employees work on-site, including about 400 employees of the Department of Energy.

Weapons production operations at the plant began in 1953 and were shut down in December 1989. However, ongoing activities at the site, including environmental restoration activities, continue to generate wastes. Handling of these wastes is addressed in the Rocky Flats waste management program. On- and off-site contamination that resulted from site operations over the past forty years are addressed in the Rocky Flats environmental restoration program.

The Rocky Flats environmental restoration program is responsible for identifying and cleaning up waste sites at Rocky Flats in accordance with applicable Federal and State laws and regulations. The Rocky Flats site was placed on EPA's National Priorities List in November 1989.

On January 22, 1991, DOE, EPA and the Colorado Department of Health signed an interagency agreement to establish a legally enforceable framework for conducting cleanup activities required under RCRA and CERCLA. The IAG set out regulatory responsibilities between EPA and the State of Colorado and established cleanup priorities, standards, and schedules. Cleanup activities were grouped in the IAG into 16 operable units with cleanup priorities set for each based on the threat to public health and the environment. The IAG also identified interim cleanup actions to address immediate threats posed by contamination at two operable units -- the 881 Hillside and the 903 PAD, Mound and East Trenches. The environmental restoration program also includes activities identified in the Surface Water Management Plan to address contamination of Great Western Reservoir and Standley Lake, two public drinking water sources located near the site.

The Rocky Flats site generates radioactive wastes, hazardous wastes, mixed wastes that are both radioactive and hazardous, and non-hazardous solid waste. The Rocky Flats waste management program is conducted within a framework of permits and compliance agreements that address both Federal and State regulatory requirements. DOE expects RCRA Part B permit applications filed with the State of Colorado to be completed in FY 1992. Management responsibilities for mixed-waste plutonium residues are currently split between DOE's Defense Program and the Environmental Management (EM) program. Compliance activities for management of these residues

are set out in the Residue Compliance Agreement of November 1989 between DOE and the State of Colorado.

Significant issues affecting FY 1993 operations include:

- ① addressing mixed plutonium residues will cost \$10.5 million in FY 1993, but could require \$300 million - \$1 billion through 1999. In addition, responsibilities for re-processing these residues may shift from Defense Program operations to EM, which could require an additional \$1.5 billion - \$2 billion in the EM program through 1999;
- ① storage capacities for mixed waste are being approached, though waste minimization programs and other efforts are expected to reduce the quantity of these wastes generated;
- ① disposal of low-level radioactive waste at the Nevada Test Site remains uncertain, pending approval by the State of Nevada of the Nevada Test Site's waste certification program.

Funding History

The following table shows funding levels for environmental restoration and waste management activities of the Rocky Flats site. The FY 1993 Unvalidated Field Estimate and Program Planning Levels represent increases over FY 1992 of 70% and 39%, respectively. The DOE request represents a 3% increase over FY 1992 funding.

ROCKY FLATS FIELD OFFICE FUNDING HISTORY (BA, \$ in Millions)

Funding Level	1991	1992	1993	1994	1995	1996	1997
Actual*	162.4	163.8					
Unvalidated Field Estimate			279.1	230.6	252.8	296.1	276.7
Program Planning Level			227.4				
DOE Budget Request			168.4				

*DOE estimate of allocation to Rocky Flats as of 11/21/91.

DOE ADS Review

The September 4, 1991, DOE report "FY 1993 ADS Review," identified a total of \$227.5 million necessary to fund legal commitments and discretionary activities (Program Planning Level). Of this total, the report identified \$168.1 million as necessary to meet all legal and regulatory requirements for waste management and environmental restoration activities, an additional \$5.0 million to comply with DOE Orders, and \$54.3 million to fund discretionary activities.

"DOE FY 1993 ADS Review, September 4, 1991 (\$ in Millions)

----- FY 1993 -----

Category	# of ADSs	Unvalidated Field Estimate	Program Planning Level	DOE Budget Request
Legally Required	74	\$217.8	\$168.1	\$142.5
DOE ES&H Orders	3	5.0	5.0	3.6
Discretionary	7	56.3	54.3	22.3
Totals	84	\$279.1	\$227.5	\$168.4

OMB/Corps Review of Funding Requirements

A joint OMB/Corps team visited the Rocky Flats site the week of November 4, 1991, to review funding requirements for each ADS and to work with DOE staff in its responses to the questionnaire. In addition, the OMB/Corps team held briefings and discussions with EPA and DOE staff before and after the site visit to review regulatory and funding requirements for the site and other issues.

OMB staff discussed regulatory and funding requirements for Rocky Flats with officials of the State of Colorado following the OMB/Corps site visit.

DOE responses to the questionnaire significantly revised the categorization of activities in the earlier DOE study. These changes result from DOE's identification in the questionnaire of subactivities within an ADS that had different legal requirements, and reclassification of certain ADSs. DOE's responses to the questionnaire identified \$159.8 million as necessary to fund all legally required activities and DOE Orders related to environment, safety, and health (ES&H Orders). The OMB/Corps team also reported that \$3.9 million requested for certain legally required activities was premature, because of slippage in construction schedules.

Based on the DOE responses to the questionnaire and other information obtained through the site visit and discussions with EPA and the State of Colorado, the

OMB/Corps review team recommended funding of \$188.9 million for Rocky Flats. This level provided funding for all legally required activities and DOE ES&H Orders, and provided an additional \$33.0 million to fund discretionary activities.

Additional Findings

The OMB/Corps team reported several additional findings to the Interagency Review Group.

- Public perceptions of risk was a significant factor in establishing cleanup standards, schedules and costs. Several proposed actions that appeared to address public perceptions of risk rather than risks that exceed health-based standards or regulatory requirements;
- Changes in responsibilities between Defense Programs and ERWM could result in a significant shift of responsibilities and funding requirements for management of plutonium residues from Defense Programs to ERWM;
- The Rocky Flats budget process hindered a complete assessment of FY 1993 funding needs, because the effects of DOE's allocation of an additional \$52 million to Rocky Flats in FY 1992 could not be determined at the time of the site visit and was not addressed in DOE's responses to the questionnaire.
- Despite the additional funds provided in 1992, following the site visit DOE staff identified a funding shortfall of \$17.5 million in 1992, which could jeopardize achievement of up to 48 milestones set out in the Rocky Flats Interagency Agreement for 1993-94.

Final FY 1993 Budget Allocation

DOE and EPA requested that the Interagency Review Group provide an additional \$88.6 million for Rocky Flats above the \$188.9 million recommended by the OMB/Corps team. The additional funds were requested for additional Surface Water Management Plan activities and additional activities in both the environmental restoration and waste management programs. The Interagency Review Group granted the total additional request.

The President's FY 1993 Budget includes a total of \$277.5 million for Rocky Flats. This level of funding ensures that all mandatory activities are fully funded and provides funds for other commitments and priority discretionary activities.

OMB/CORPS ANALYSIS OF DOE ADS REVIEW REPORT
(Based on Program Planning Level)
(\$ in Millions)

DOE ADS Review	DOE Questionnaire Responses ADS and Subactivity	Proposed Funding Level
Legally Required	Legally Required \$151.2	\$203.9
	DOE ES&H Orders 3.4	3.4
	DOE Manage/Plan Orders 10.5	10.5
	Discretionary 2.9	.2
\$168.0	Subtotal \$168.0	\$218.0
DOE ES&H Orders \$5.0	Legally Required \$5.0	\$5.0
Discretionary	DOE ES&H Orders .2	.2
	Discretionary 54.3	54.3
\$54.5	Subtotal \$54.5	\$54.5
\$227.5	Total \$227.5	\$277.5

Cost Review Summary

The Corps conducted an in-depth review of 5 Rocky Flats ADSs, 4 project ADSs and 1 program-wide ADS, to evaluate the reasonableness of costs and cost estimation procedures used by the Rocky Flats Office. These ADSs were selected to represent a cross-section of the environmental restoration and waste management activities conducted at Rocky Flats. Funding of these ADSs represents about 16% of the total Rocky Flats ERWM program (at the Unvalidated Field Estimate Level).

The major findings of the review were:

- Budget needs are potentially overstated because various contractor activities and/or contract organizations are budgeted in more than one place. For example, items such as project management, health and safety, quality assurance, and training are included in project ADSs, both as direct and overhead costs, and in program support ADSs, which cover the costs of many support or overhead groups at Rocky Flats;
- The indirect markup rate for the M&O contractor on labor is about 277%, which is considered to be high;

- The M&O contractor's cost estimating procedures use too many discretionary factors to mark up direct costs, which could potentially overstate construction costs;
- Sub-contracting costs are likely to be higher than necessary due to DOE procurement practices that restrict competition for certain types of work, e.g., delivery orders that require the use of contractors under a Base Order Agreement system;
- On-site DOE personnel are not trained in cost estimating procedures and rely heavily on contractors to estimate costs;
- Known schedule slippages were not adequately factored into the budget process. For example, there is a funding request of \$4.0 million in FY 1993 for a new sanitary landfill project when DOE indicated only \$100 thousand is needed, because the current schedule anticipates slipping awarding the construction contract to FY 1994.
- DOE advised the team that the M&O contractor had been audited in the year before the OMB/Corps visit and was found not to be in compliance with the Government's Cost Accounting Standards. (Changes have been made, but compliance was not confirmed at the time of the site visit.)

SUMMARY: SAN FRANCISCO FIELD OFFICE

Description of the Site:

The San Francisco Field Office oversees activities at seven installations. The environmental restoration program of the San Francisco Field Office includes 62 ADSs addressing activities at all seven sites. The majority of the remedial action efforts being conducted at these locations are in support of CERCLA and/or RCRA requirements as provided for in Federal Facility Agreements, State Orders or Memoranda of Agreement. The waste management program includes 33 ADSs involving four San Francisco Field Office sites. Waste management activities are required principally by RCRA and State statutes and regulations, further defined for each site in permits, final and proposed compliance agreements, court orders, and DOE Orders.

Lawrence Livermore National Laboratory (LLNL)

The laboratory's primary missions are weapons development, fusion and biomedical research. The Laboratory operations are at two locations: the main site located approximately 3 miles from the city of Livermore, California; and Site 300 located 15 miles east of the main site near the town of Tracy. Both sites are listed separately on the EPA National Priorities List.

The environmental restoration activities at Lawrence Livermore National Laboratory represent about 50% of total environmental restoration funding in FY 1993 for the San Francisco Field Office. Principal activities include remedial investigation/feasibility studies for Site 300, final design and remedial cleanup activities at the Main Site, and landfill closure operations. Activities at the Main Site are conducted under a Federal Facility Agreement between DOE, EPA, and the State of California. A Federal Facility Agreement for Site 300 is in the final stages of completion.

Waste management activities at the LLNL represent over 80% of total waste management funding for the San Francisco Field Office. LLNL conducts treatment, storage, and disposal activities to manage the radioactive, mixed radioactive and hazardous, and hazardous waste generated at the laboratory. Funding is also provided to the State of California to cover the State's costs of oversight of environmental compliance programs at San Francisco Field Office facilities under the terms of an Agreement-in-Principle between DOE and the State of California.

Lawrence Berkeley Laboratory

The laboratory's mission includes operation of particle accelerators, chemistry and biomedical research laboratories, and supporting facilities. Principal environmental concerns involve the potential release of heavy metals and other pollutants to the sanitary sewer system from current operations and soil and groundwater.

contamination that may have occurred from prior operations. The site consists of 130 acres in an urban environment on land leased to DOE from the University of California.

The environmental restoration program includes continuation in FY 1993 of site characterization and preparation of site assessment documents, and RCRA closure activities at the existing waste handling facility. The waste management program handles radioactive, mixed radioactive and hazardous, and hazardous wastes. Activities include collection, storage, treatment, and shipment of wastes for off-site disposal. The new waste handling facility is expected to become operational the first quarter of FY 1993.

Stanford Linear Accelerator Center

The Center is an energy research facility dedicated to theoretical and experimental research in high-energy particle physics and the development of new techniques in high-energy accelerators and experimental apparatus. The site consists of 426 acres owned by Stanford University.

The waste management program includes activities for packaging, transport and shipment for off-site disposal of hazardous radioactive waste generated on site.

Environmental restoration assessment activities for soil and groundwater contamination are to be initiated at two sources at the site.

Santa Susana Field Laboratory

The Santa Susana Field Laboratory (SSFL) is composed of 2,600 acres located in the Simi Hills approximately 30 miles northwest of downtown Los Angeles, California. The laboratory includes former fuel fabrication facilities, a hot-cell facility, a reactor test building, and other radiologically contaminated facilities. Contaminated soils and groundwater also exist at the site. Waste management activities include waste characterization, storage and packaging for off-site disposal of radioactive, mixed and hazardous waste generated on-site, including surplus sodium wastes. The principal activities in the environmental restoration program are groundwater characterization, remediation of the Sodium Disposal Facility and immediate surrounding area, and decontamination and decommissioning of the Rockwell International Hot Lab. Soil and groundwater characterization activities are ongoing at the Radioactive Materials Disposal Facility.

The Energy Technology Engineering Center (ETEC) consists of DOE-owned buildings on a 90-acre leased portion of SSFL. ETEC facilities are used to test systems and components for energy, power conversion, and liquid metal development programs. Waste management activities include treatment and disposal of surplus sodium. Environmental restoration activities include decontamination and decommissioning of

a former System for Nuclear Auxiliary Power Reactor Test Facility, a former used uranium carbide casting facility, a former facility for corrosion study of radioactively contaminated test metal loops, and a former radioactive materials vault and storage area. D&D of these facilities will be completed in FY 1993. In addition, surveillance and maintenance of ancillary buildings and work areas associated with former ETEC operations are ongoing.

Laboratory for Energy-Related Health Research

The laboratory was used by the University of California at Davis to conduct a DOE-sponsored research program on the health effects of exposure to low levels of radiation to beagle dogs. The laboratory occupies a 15-acre site located approximately one mile south of the main campus of the University of California at Davis. The environmental restoration program at the site includes characterization of contaminated soil on-site and potential off-site groundwater contamination, and decontamination and decommissioning of two animal hospitals, holding tanks, a tank trailer, and a Cobalt 60 irradiator building. Removal, packaging and shipment of waste materials for off-site disposal is also included. There are no waste management activities at this site.

General Atomics

The General Atomics site is privately owned and is located in La Jolla, California. Since the late 1950's, General Atomics has supported DOE contracts that required use of the Hot Cell and Fuel Development Laboratory facilities. Environmental restoration activities include decontamination and decommissioning of both of these NRC-licensed facilities for unrestricted release. There are no waste management activities in FY 1993.

General Electric

The General Electric Valicitos Nuclear facility is privately owned and is located near Pleasanton, California. Environmental restoration activities at this site includes decontamination and decommissioning and surveillance and maintenance of Cell 4 of the Hot Cell facility and D&D of an Emission Spectrograph Enclosure (Glovebox), both NRC-licensed facilities. D&D of the Hot Cell will be for continued use, D&D of the glovebox will be for unrestricted release. There are no waste management activities in FY 1993.

Funding History

The following table shows funding levels for environmental restoration and waste management activities of San Francisco Field Office sites.

SAN FRANCISCO FIELD OFFICE FUNDING HISTORY
(BA, \$ in Millions)

Funding Level	1991	1992	1993	1994	1995	1996	1997
Actual*	58.7	120.0					
Unvalidated Field Est.			137.2	106.4	128.8	80.0	87.4
Program Planning Level			126.1				
DOE Budget Request			98.4				

*DOE estimate of allocation to San Francisco as of 12/16/91.

DOE ADS Review

The September 4, 1991, DOE study "FY 1993 ADS Review" identified a total of \$126.1 million as necessary to fund legal commitments and discretionary activities of the San Francisco Field Office (the Program Planning Level). Of this total, the report identified \$101.2 million as needed to meet all mandatory activities, \$.9 million for DOE Orders, and \$24.0 million for discretionary activities.

"DOE FY 1993 ADS Review, September 4, 1991"
(\$ in Millions)

-----FY 1993-----

Category	# of ADSs	Unvalidated Field Estimate	Program Planning Level	DOE Budget Request
Legally Required	83	\$105.7	\$101.2	\$88.7
DOE ES&H Orders	8	0.9	0.9	0.3
Discretionary	13	30.6	24.0	9.5
TOTAL	104	\$137.1	\$126.1	\$98.4

OMB/Corps Review of Funding Requirements

A joint OMB/Corps team visited the San Francisco Field Office the week of December 2, 1991, to review funding requirements for each ADS and to review DOE responses to the questionnaire. In addition, the team conducted briefings with DOE staff before and after the site visit and with EPA Region 9 and Headquarters staff.

OMB staff met with officials of the State of California to discuss regulatory and funding requirements for San Francisco Field Office installations on December 6, 1991.

DOE responses to the questionnaire significantly revised the categorization of activities in the earlier DOE study. Based on DOE responses to the questionnaire and other information gathered from the site visit and briefings, the OMB/Corps team recommended to the Interagency Review Group that the San Francisco Field Office receive \$115.1 million in FY 1993 funding. This level of funding would provide the \$82.2 million identified in the questionnaire as required to fund all legally required activities and the \$7.1 million required for DOE environment, safety, and health Orders.

Funding was also included for activities required in the draft interagency agreement for LLNL Site 300 where milestones for completion of activities had not yet been set. However, the OMB/Corps review team also reported that \$3.1 million of the \$9.3 million requested by DOE for LLNL Site 300 was premature. The revised schedule for completion of RI/FS activities had slipped by two years thereby changing the date when actual cleanup activities can begin. However, the team noted that additional funding may be required to address new RI/FS requirements.

The OMB/Corps team recommended an additional \$16.7 million to fund priority discretionary activities.

Final FY 1993 Budget Allocation

DOE requested that the Interagency Review Group provide an additional \$4.3 million in FY 1993 above the \$115.1 million recommended by the OMB/Corps review team, primarily to cover the costs of new RI/FS activities. The Interagency Review Group granted the entire additional request.

The President's FY 1993 Budget provides \$119.4 million for the San Francisco Field Office.

OMB/CORPS ANALYSIS OF DOE ADS REVIEW REPORT
(Based on Program Planning Level)
(\$ in Millions)

DOE ADS Review	DOE Questionnaire Responses ADS and Subactivity	Proposed Funding Level
Legally Required	Legally Required \$73.4 Proposed IAG 9.3 DOE ES&H Orders 5.9 DOE Manage/Plan Orders 7.7 Discretionary <u>4.9</u>	\$75.0 8.8 7.2 6.5 <u>3.3</u>
\$101.2	Subtotal \$101.2	\$100.8
DOE ES&H Orders	Legally Required \$0.3 DOE ES&H Orders <u>0.6</u>	\$0.3 <u>0.6</u>
\$0.9	Subtotal \$0.9	\$0.9
Discretionary	Legally Required \$11.7 DOE ES&H Orders 0.6 DOE Manage/Plan Orders 9.1 Discretionary <u>2.7</u>	\$11.7 0.6 2.8 <u>2.6</u>
\$24.0	Subtotal \$24.0	\$17.7
\$126.1	TOTAL \$126.1	\$119.4

Cost Review Summary

The Corps conducted an in-depth review of 9 ADS for the Lawrence Livermore National Laboratory to determine the cost estimating procedures used at the San Francisco Field Office to arrive at its budget estimates. The review concluded that:

- Indirect markup of direct labor rates are high resulting in a burdened cost for M&O labor varying from 3.2 to 3.7 times the base labor rate per hour depending on the contractor organization. This compares to an average multiplier of 2.3 for comparable Corps projects.
- The M&O contractor for Lawrence Livermore National Laboratory is not required to follow the Federal Acquisition Regulations (FAR). Although some

recent procurements have been made under open competition, the lack of the FAR requirement limits competition, which may potentially increase project costs.

- There is a potential for overstating the budget request for items such as health and safety, since these items may be included both in project ADSs as direct and indirect costs and in the program support ADSs.
- Escalation factors used for FY 1993 ranged from 4.1% to 6.6%, based on the contractor's judgement. These factors are generally higher than those specified by OMB for Corps use.
- The DOE on-site office does not have a staff of in-house personnel trained in cost estimating and DOE's management personnel have limited time to review the cost and scope of projects.

SUMMARY: SAVANNAH RIVER FIELD OFFICE

Description of the Site:

The Savannah River Plant is DOE's primary installation for the production of nuclear materials for Defense Programs.

The site comprises 300 square miles and employs over 22,000 people. The main activity is the restart of the K-Reactor and the resumption of production of tritium after several years of upgrades and safety improvements.

Environmental restoration activities at the site involve cleanup of 79 individual sites. The program is based on aggressive schedules specified in a Federal Facilities Agreement (FFA) which is to be signed soon. Currently the activities are driven by separate agreements and requirements under CWA, CAA, SDWA and RCRA.

Waste management activities are divided programmatically at the site into management of liquids and management of solids.

Liquid waste is currently separated into sludge and salt and stored separately. Of 51 tanks in operation, 24 tanks are out of compliance with RCRA and must be retired. The single most important project for waste management is the Defense Waste Processing Facility (DWPF). In this facility DOE will mix high level waste in the form of sludge with glass melt and store the solidified waste as glass logs until a national high level waste repository is available. By solidifying the waste, DOE will empty the tanks, which will then be retired from service.

One fixed milestone drives all the activities. The start-up date for DWPF is Dec 31, 1993. This date is specified in a Federal Facility Compliance Agreement. The rate of operation, the actual throughput of the facility, is to be specified 90 days after start-up.

Waste management of solids primarily supports current operations of the weapons program. The relevant quantities are as follows:

-Sanitary waste	40 tons/day
-Low level waste	896,000 cu ft/yr
-Intermediate level	63,000 cu ft/yr
-Mixed waste	25,000 cu ft/yr
-Hazardous waste	4,000 cu ft/yr
-TRU waste	39,000 cu ft/yr

Funding History

Shown below is a funding history for the ERWM activities at the Savannah River site through FY 1992. The table also includes projections for growth based on the DOE's Unvalidated Field Estimate. This continued growth dictated by the need to build several facilities to process and store the large amount of solid and liquid radioactive waste at the site. The budget is expected to level off around 1997 when these projects are completed.

SAVANNAH RIVER FIELD OFFICE FUNDING HISTORY (BA, \$ in Millions)

Funding Level	1991	1992	1993	1994	1995	1996	1997
Actual	603*	546					
Unvalidated Field Estimate			799	972	1,153	1,160	1,122
Program Planning Level			650				
DOE Budget Request			545				

* Includes \$50 million of FY 1991 supplemental funding for activities completed in FY 1991.

DOE ADS Review

The following chart shows the ADSs at Savannah River as grouped by the DOE's recent study:

"DOE FY 1993 ADS REVIEW, September 4, 1991" (\$ in Thousands)

-----FY 1993-----

<u>Category</u>	<u># of ADSs</u>	<u>Unvalidated Field Estimate</u>	<u>Program Planning Level</u>	<u>DOE Budget Request</u>
Legally Req.	107	663,936	531,262	450,077
DOE Orders	21	115,982	101,725	84,063
Discretionary	90	19,091	17,066	11,266
TOTAL	218	799,009	650,053	545,406

OMB/Corps Review of Funding Requirements

The completed questionnaires were received at OMB on November 25. The responses to the questionnaire at Savannah River were difficult to interpret, because DOE staff provided multiple requirements categories instead of single categories. Ascertaining the appropriate single category for an ADS was left to discussions with the DOE staff. In addition, the DOE staff provided inadequate data at the sub-activity level. This was a problem primarily for general area-wide activities, e.g. monitoring, training, capital equipment, small construction projects.

OMB and Corps staff met with DOE and contractors at Savannah River from December 2 to December 5. During those discussions, the problem of multiple categories remained unresolved. In addition, for waste management (WM) activities, backup for cost data was poor at the PPL level.

OMB and the Corps made two recommendations to the Interagency Review Group.

1. Based on analysis of the subactivities instead of merely the overall activities considered to be mandatory by the DOE ADS Review, an accurate total for legally required subactivities was not the PPL level of \$531.3 million, but rather \$474.2 million.
2. Based on a review of the actual pace of both the ER and WM activities, which is limited by non-budgetary factors, there will likely be continued schedule slippage. DOE will be unable to maintain the pace which is represented in its

- cost estimates. This implies that DOE may be unable to effectively spend funds carried forward into FY 1992. These funds amounted to \$68.9 million.

Final FY 1993 Budget Allocation

At the final meeting of the IAG, DOE made a strong case that funds carried forward into FY 1992 would be spent in FY 1992. In addition, Assistant Secretary Duffy raised a new issue, that funds were needed to replace certain leaking tanks at the Savannah River site. As a result of discussions of these issues, the IAG decided that:

1. DOE should continue to plan to spend the funds carried forward in FY 1992. The FY 1993 budget should not be reduced by \$68.9 million assuming that these funds will be carried forward into FY 1993.
2. DOE should receive an additional \$16 million needed to replace high level waste tanks.

As a result of these decisions, the final total for Savannah River was brought to \$640.7 million. The final results for Savannah River are shown below.

OMB/CORPS ANALYSIS OF DOE ADS REVIEW REPORT
(Based on Program Planning Level)
(\$ in Millions)

DOE ADS Review	ADS Questionnaire Responses and Subactivity Review	Proposed Funding Level
Legally Required	Legally Required \$436.4	\$448.3*
	DOE ES&H Orders \$ 0.1	\$ 0.1
	DOE Mgmt Orders \$ 72.4	\$ 69.1
	Discretionary \$ 22.4	\$ 20.6
\$531.3	Subtotal \$531.3	\$522.1
DOE Orders	Legally Required \$ 32.1	\$ 32.1
	DOE ES&H Orders \$ 3.4	\$ 3.4
	DOE Mgmt Orders \$ 59.9	\$ 48.4
	Discretionary \$ 6.3	\$ 6.3
\$101.7	Subtotal \$101.7	\$ 90.2
Discretionary	Legally Required \$ 6.7	\$ 6.6
	DOE ES&H Orders \$ 0	\$ 0
	DOE Mgmt Orders \$ 5.2	\$ 0.9
	Discretionary \$ 5.2	\$ 4.9
\$ 17.1	Subtotal \$ 17.1	\$ 12.4
	Subtotal \$650.1	\$624.7
\$650.1	TOTAL \$650.1	\$640.7

*Includes \$16M for high-level waste tanks.

Cost Review Summary

The Corps cost review identified 29 project-specific ADSs and 12 program-wide ADSs at the Savannah River Site. Project costs were separated into direct, overhead, contingency, and escalation for each project. Overhead from program-wide ADSs was distributed back to those projects and overhead was then compared to standard overhead rates used by the Corps of Engineers.

The major conclusion of the cost analysis was that project and program management and contractor overhead are higher in comparison to DOE direct cost than for comparable projects done by the Corps. Thus both the percentage of overhead and the resulting total costs are greater for DOE projects. Results are shown below for the ADSs that were reviewed by the Corps.

Overhead comparison DOE versus Corps for 29 project ADSs. (Comparison includes prorated shares of overhead costs from 12 program-wide ADSs.):

ADS Group	# ADSs	DOE overhead	Corps overhead
ER Assessments	2	38%	25%
ER Cleanup	8	53%	35%
WM Operations	13	55%	35%
WM Construction	2	47%	26%
DWPF	4	50%	28%

Total cost comparison, DOE versus Corps, for several projects:
(\$ in millions)

ADS Group	# ADSs	DOE total cost	Corps total Cost
ER Assess.	2	5.2	5.1
ER Cleanup	8	37.9	34.9
WM Operating	13	258.5	174.2
WM Const.	2	58.7	33.7
DWPF	4	135.6	91.0
Total of 29 Project ADSs	29	495.8	338.7

For the ADSs included in the analysis, the difference between the DOE estimate and the estimate of comparable Corps projects represents 24 percent of the DOE cost estimate. No reduction in the DOE budget was applied based on the cost analysis. Instead, these findings form the basis of long term recommendations to address overhead and contractor management issues.

Other Findings:

- The review found no historical record for project costs and no standardized cost estimating system. Westinghouse is in the process of implementing a new budget and accounting system.
- Cost backup for the ADSs lacked detail sufficient to support the cost estimates shown in the ADSs.
- There was no standard method of estimating overhead applied to labor. The ER and WM ADSs handled that item differently.
- Escalation was not applied consistently, although escalation rates were generally in the range of 0-5% per year.
- For most ER activities reviewed the budget estimates are based on excessively conservative assumptions regarding the technical scope of proposed projects.

SUMMARY: DOE HEADQUARTERS

Description of the Site:

DOE Headquarters funding falls into two main categories -- Program Management and Technology Development (TD). Program Management consists primarily of funding for salaries and expenses of ERWM staff, and technical or general support services for the Environmental Restoration (14 ADSs) and Waste Management (13 ADSs) operations. Technology Development consists of research and development activities which will develop and apply more effective technologies for meeting DOE's 30-year ERWM goals, including a number of integrated demonstrations as well as educational programs and international exchange. Technology development also includes the transportation management program, which is responsible for ensuring the safe, secure, and economical transportation of DOE materials, including radioactive and other hazardous materials and waste.

Funding History

Headquarters funding grew by 35% from FY 1991 to FY 1992. Each of the three DOE funding levels for FY 1993 continued to project significant growth over FY 1992, ranging from 21% to 87%. The following table shows the various funding projections, including the outyears where available.

HEADQUARTERS FUNDING HISTORY
(BA, \$ in Millions)

Funding Level	1991	1992	1993	1994	1995	1996	1997
Actual	402	543					
Unvalidated Field Estimate	417	567	1,017 +87%	1,238	1,259	1,278	1,260
Program Planning Level			869 +60%				
DOE Budget Request			656 +21%	736	933	1,030	1,348

It is important to note that the figures in this table reflect only the funding levels for the Headquarters ADSs. In addition, Headquarters is setting aside for contingencies 10% of the FY 1992 funding for all Environmental Restoration ADSs and 5% of the funding for all Waste Management ADSs, so a significant amount of field office ADS funding has become a reserve fund under Headquarters control.

DOE ADS Review

The DOE study "FY 1993 ADS Review, September 4, 1991" identified a total of \$868.7 million as necessary to fund legal commitments and discretionary activities of DOE Headquarters (the Program Planning Level). Of this total, the report identified \$356.9 million as legally required, \$31.7 million as necessary to comply with DOE Orders, and \$480.1 million for discretionary activities.

"DOE FY 1993 ADS Review, September 4, 1991" (\$ in Millions)

-----FY 1993-----

Category	# of ADSs	Unvalidated Field Estimate	Program Planning Level	DOE Budget Request
Legally Required	17	\$433.6	\$356.9	\$246.5
DOE Orders	4	27.1	31.7	18.1
Discretionary	11	556.3	480.1	391.5
TOTAL	32	\$1,017.0	\$868.7	\$656.0

OMB/Corps Review of Funding Requirements

A joint OMB/Corps team met with Headquarters staff the week of November 18, 1991, to review funding requirements for each ADS and DOE responses to the questionnaire. The DOE questionnaire responses significantly revised the categorization of activities in the earlier DOE study. The table entitled, "OMB/Corps Analysis of DOE ADS Review Report," compares the DOE study to DOE responses to the questionnaire.

The questionnaire responses classified 92% of Headquarters funding as discretionary. Thus, the recommended funding for Program Management and Technology Development reflects a judgment of the funding required for efficient and prudent management. For example, while Program Management at Headquarters usually is not required by statute, regulation or Federal Facility Agreements, some level of funding is needed to coordinate those field activities that are legally required.

The Interagency Review Group agreed upon a funding level of \$235.4 million for ERWM Headquarters Program Management, an increase of 6.7% over the FY 1992 level, and \$335.2 million in FY 1993 funding for Technology Development, an increase of 4% over the FY 1992 level. Much of the difference between the OMB recommendation and the level of funding in the DOE Budget Request is due to agreement between OMB and DOE setting a personnel level of 1,598 FTEs for the ERWM program in FY 1993, an increase of 661 FTE'S over FY 1991, but lower than the assumption in the budget estimates.

Final FY 1993 Budget Allocation

The President's FY 1993 Budget provides \$570.6 million for DOE Headquarters, an increase of 5% over the FY 1992 level. This level of funding is comparable to the recommendation of DOE's Independent Cost Estimate (ICE) review, but the IAG allocation is different. The ICE team recommended less funding for Technology Development and more for Program Management. The IAG concluded that DOE's inability to meet long-term compliance goals with current technology and need for improved cost-effectiveness supported increased funding for the TD program.

The ICE team reported that at Headquarters: "Thirty-seven percent of ADSs do not represent real work scope and are budgeting wedges." In light of this finding, as well as the significant management reserves contained in the Headquarters ADSs or withheld from other ADSs, the IAG concluded that a 6.7% increase in Program Management funding is sufficient.

OMB/CORPS ANALYSIS OF DOE ADS REVIEW REPORT
(Based on Program Planning Level)
(\$ in Millions)

DOE ADS Review	DOE Questionnaire Responses ADS and Subactivity	Proposed Funding Level
Legally Required	Legally Required \$43.3	\$36.6*
	DOE ES&H Orders 7.5	4.8*
	DOE Manage/Plan Orders 5.1	1.1
	Discretionary 301.0	143.9
\$356.9	Subtotal \$356.9	\$186.4
DOE ES&H Orders	Legally Required \$10.0	\$7.0*
	DOE ES&H Orders 10.0	10.0
	DOE Manage/Plan Orders 2.0	3.0
	Discretionary 9.7	2.1
\$31.7	Subtotal \$31.7	\$22.1
Discretionary	Discretionary \$480.1	\$362.1
\$480.1	Subtotal \$480.1	\$362.1
\$868.7	TOTAL \$868.7	\$570.6

*Reduction from PPL level due to DOE re-estimates, in the cost backup to the questionnaires, of funds necessary to meet legal requirements and DOE ES&H Orders in FY 1993.

Corps Cost Review Summary

The Corps conducted an in-depth review of 4 ADSs at DOE Headquarters. The Corps review concluded that:

- Contractor overhead is approximately 20% higher than the Corps overhead estimates (DOE 29% vs. Corps 23.8%).
- DOE's total overhead and total costs are higher than the Corps estimates.
- Headquarters ADSs include a significant amount of management reserve.

V. RECOMMENDATIONS FOR FURTHER ACTION

The FY 1993 President's Budget proposals are designed to ensure that all legal requirements, DOE ES&H Orders, and a prudent level of discretionary activities will be met in FY 1993. The FY 1993 President's Budget includes a total of \$5,534 million for ERWM activities (including uranium enrichment), a 26 percent increase over FY 1992. In addition, the budget provides an FTE level of 1,598, an increase of 71 percent over the FY 1991 level, to strengthen program management, improve cost control and increase contractor oversight.

Increased funding and personnel resources, although necessary, will not ensure prompt and effective clean-up. The agency representatives to the IAG expressed strong concern about the OMB/Corps and DOE ICE Team findings and observations regarding potentially excessive management and overhead costs which inevitably plague a program experiencing this type of growth. The IAG developed six recommendations to increase cost control and improve program management.

1. The DOE Progress Tracking System (PTS) Should Be Implemented Expeditiously, Including the Changes Identified in a Recent DOE Evaluation Study. The PTS was put into effect on October 1, 1991, but is not yet fully operational. At the request of OMB, the DOE Office of Policy, Planning and Analysis recently completed an independent evaluation of the PTS. The draft final report, "Independent Evaluation of the EM Progress Tracking System", dated January 14, 1992, recommended several improvements to the PTS. Three high priority improvements include:

- A re-structuring of the ADSs to reflect a more logical work breakdown structure;
- Identifying the legal requirements and DOE Orders applicable to each ADS and subactivity; and
- Measuring actual expenditures against planned expenditures on a monthly basis as well as measuring clean-up progress against expenditures.

The ERWM Program has initiated steps to implement the recommendations in the Policy Office evaluation study. These additional changes should be implemented by September 1, 1992, so that the PTS will be fully operational by the beginning of FY 1993.

2. The ERWM Budget Execution Process Should be Revised to Increase Accountability and Ensure that Legal Requirements are Met. Two specific changes are recommended:

- **Budget Execution Plan:** DOE should develop and publish a formal budget execution plan describing the proposed allocation of funds appropriated by Congress, including the use of prior-year carry-over balances. The purpose of the plan would be to ensure that appropriated funds are spent on the activities originally justified in the budget requests, particularly in the case of legally-required activities. The plan should identify any changes made in funding allocations from those contained in the original budget request.
- **Change Control Process:** The DOE Chief Financial Officer, working with ERWM, should establish a formal change control process for ERWM budget execution. Any ADS level changes in funding made as the fiscal year progresses should be reported to DOE senior management, OMB, Congress, and cognizant regulatory agencies, even if such changes are below the threshold level for formal reprogrammings. OMB concurrence would be required for any changes affecting legally required milestones. The change control process would complement and not substitute for formal reprogrammings.

The IAG discussed the possibility that OMB apportion funds by site to improve accountability for budget execution (e.g. ensure that funds budgeted for a site are not withheld or re-allocated). However, DOE believed strongly that it needed flexibility to manage the program to respond to rapidly changing circumstances. The two specific recommended actions--the formal budget execution plan and the change control process--strike an appropriate balance between the need for program management flexibility and the need to increase accountability to ensure that legal requirements are met. If these steps cannot be taken, then apportionment by site will have to be reconsidered.

3. **DOE Should Undertake a More Detailed Analysis of Field Office Overhead Costs and Put in Place Revised Overhead Rates in Time to Achieve Savings in FY 1993 and Future Years:** This review should develop common definitions of direct and overhead costs, and should not charge the ERWM program with overhead costs that are unrelated to ERWM site activities. DOE should implement measures to achieve real savings in overhead costs, rather than simply shifting costs to other DOE programs. The review should be completed by July 1, 1992, and new overhead rates implemented for each ERWM site.
4. **DOE Should Develop and Implement Revised Cost Estimating Guidelines:** Although the ERWM program claims that DOE initiated cost estimating guidelines in March 1991 to be used in the preparation of the FY 1993-1997 Five-Year Plan and the FY 1993 budget, this report documented numerous instances of significant problems in the ERWM cost estimates. The March 1991 guidelines, if in fact they were applied at all, apparently were inadequate or not applied properly. To remedy this problem, the IAG recommends that DOE issue new, stronger guidelines, including explicit policies on escalation rates

and contingency factors for ERWM projects that would permit easy verification and validation. The new guidelines should be developed, in coordination with the Corps and OMB, by June 15, 1992, so that they can be utilized by the ERWM Field Offices in the preparation of the FY 1994 budget. To ensure full compliance with the new guidelines, the Department should establish a formal independent cost review audit function to provide continuing oversight of ERWM Field Office cost estimates for the FY 1994 budget.

5. The ERWM Program Should Completely Restructure the Planning Process for the Technology Development Program¹ including:

- directly linking technology development priorities to ERWM site needs;
- working with EPA and the States to incorporate technology development alternatives into the RI/FS process; and
- increasing the prospects for technology transfer through greater competition in research and development funding, and by encouraging collaborative research and development ventures with industry (including non-Federal cost sharing where appropriate).

6. The Quality of the ERWM Five-Year Plan Should be Improved Substantially; the Plan Should Incorporate a Risk-Based Priority System; and the Plan Should be Supplemented as Necessary to Meet the Requirements of OMB Circular No. A-106: Three separate reviews--the DOE ADS Review, the OMB/Corps Review and the DOE ICE Team--were required in order to arrive at a final credible budget for FY 1993. The fact that three separate reviews were needed illustrates a more fundamental problem with the quality of the ERWM Five-Year Plan. The Five-Year Plan process needs to be improved in several respects if it is to be an effective tool for program planning, budgeting and management. These improvements include:

- a more direct linkage between legal requirements and ADSs;
- a more specific description, including milestones, of the proposed clean-up actions at each site;
- more accurate cost estimates; and
- a more detailed assessment of actual progress.

¹The ERWM program noted that the "planning process for R&D was completely revised for FY 1992 after completion of Initial Cost Quality Management Studies conducted by ERWM from July 1991 through October 1991." However, as documented in the observations of the OMB/Corps review team, the revised process failed to achieve the objectives described above. A further restructuring appears needed.

In addition, the Five-Year Plan should present the ADSs in terms of DOE's overall priorities for the ERWM program. DOE has been developing a formal priority-setting system in consultation with other Federal and State agencies, Indian Tribes, and other interested parties, to ensure that activities needed to meet legal requirements and protect health, safety, and the environment are given priority in program planning and execution. This risk-based priority-setting system should be integrated into the Five-Year Plan process to rank individual ADSs, thereby ensuring priority cleanups across facilities in different States and regions. At the request of OMB, the Department undertook a pilot study of risk-based budgeting in 1991. The pilot study covered 24 ADSs, and evaluated risks to the public and the workers. The experience gained from this effort could form the basis for implementing a full-scale risk-based budget throughout the entire ERWM program.

The DOE Progress Tracking System should be linked to the risk-based priority system. This would make it possible to track progress in achieving legal requirements and DOE ES&H Orders over time. Together, the risk-based priority system, in conjunction with the Progress Tracking System, should form the basis for future Five-Year Plans.

OMB Circular A-106 requires that Federal agencies prepare Pollution Control Plans, detailing proposed projects and estimated costs to achieve compliance with applicable Federal, State or local pollution control standards. Each agency's plan is submitted to EPA for review, and then, forwarded to OMB with EPA's evaluation of each agency's plan. The A-106 process is a tool through which EPA can provide technical assistance to Federal agencies in planning their environmental project needs and through which OMB can ensure that sufficient funding is included in the President's Budget for priority environmental projects. For FY 1993, the DOE ERWM program used the Five-Year Plan as its A-106 submission. Because of the problems discussed earlier with the Five-Year Plan, the ERWM A-106 submission for FY 1993 did not meet the goals of Circular A-106. The IAG recommends that DOE, EPA and OMB reevaluate the appropriate ERWM submission under A-106 for the FY 1994 budget.