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STATEMENT OF

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AND

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ON BEHALF OF

THE NATURAL RESOURCES DEFENSE COUNCIL

BEFORE

THE DEPARTMENT OF ENERGY DEFENSE NUCLEAR FACILITIES PANEL

OF THE COMMITTEE ON ARMED SERVICES
U.S. HOUSE OF REPRESENTATIVES

REGARDING

THE DEPARTMENT OF ENERGY'S FISCAL YEAR 1993 BUDGET

March 30, 1992

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Good afternoon. I am Jim Werner, representing the Natural Resources Defense Council (NRDC) where I serve as a Senior Environmental Engineer. Prior to joining NRDC in 1989 I was an engineer at ICF Technology, Inc, where I served as a consultant to the Department of Energy performing hazardous waste field investigations at DOE facilities throughout the United States and also assisted DOE in developing a system for establishing environmental priorities. I also provided environmental consulting services to the EPA, the Congressional Office of Technology Assessment (assisting in "Superfund Strategies," April 1985), the Department of Defense, and a variety of private corporations.

Soon after joining NRDC in 1989 I was appointed by DOE to its "External Review Group" to review its priority-setting system. More recently, I have served as a member of the Environmental Protection Agency (EPA) Federal Facilities Environmental Management Dialogue group. I have a Masters degree in Environmental Engineering from The Johns Hopkins University and have authored numerous technical and policy articles on the costs and technologies of hazardous waste cleanup.

Also testifying today is Dan W. Reicher. Dan is a senior attorney with NRDC, and director of NRDC's Defense and Environment Project. While at NRDC, he has served as a consultant to the Sandia National Laboratory and the Congressional Office of Technology Assessment, and was recently appointed to the National Academy of Sciences Board on Radioactive Waste Management. Dan is also an adjunct professor at the University of Maryland Law School where he teaches a course in nuclear regulation. Prior to joining NRDC, he was an Assistant Attorney General for environmental protection in the Commonwealth of Massachusetts, a law clerk to a federal district court judge, a staff member of the President's Commission on the Accident at Three Mile Island, and a legal assistant in the hazardous waste section of the U.S. Department of Justice. Dan is a graduate of Stanford Law School and Dartmouth College.

We would also like to acknowledge the valuable assistance of Karen Current, Blan Holman and Karen Cramer in helping to prepare this testimony. Ms. Current is a graduate of the University of Delaware and has served as a staff assistant in the Defense and Environment Project since 1990 as well as the intern coordinator for NRDC's Washington office. Mr. Holman is a graduate of The University of North Carolina at Chapel Hill, a co-founder of the Student Environmental Action Council, and has performed extensive research on nuclear fuel reprocessing and a number of other issues at NRDC. Ms. Cramer is a graduate of Dartmouth College and is a Scoville Fellow at NRDC.

NRDC is a national environmental organization with over 160,000 members and contributors and a staff of more than 160 lawyers, scientists, environmental specialists and support personnel at offices in New York, Washington, San Francisco, Los Angeles, and Honolulu. NRDC pursues a broad range of environmental, energy, and defense issues. The organization has long been concerned about safety and environmental problems at Department of Energy nuclear facilities. Over the past twelve years, the NRDC Nuclear Project has won a number of lawsuits to enforce federal environmental laws at DOE facilities including Hanford, Washington; Oak Ridge, Tennessee; the Savannah River Site, South Carolina; and the Waste Isolation Pilot Plant, New Mexico.

We are pleased to have this opportunity to present our views on the Department of Energy's Fiscal Year (FY) 1993 budget request.

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INTRODUCTION

Since FY 1990, the Energy Department's environmental restoration and waste management (ERWM) budget has nearly doubled,[1] resulting in a cumulative budget of more than $15 billion, including its FY 1993 request.[2] Before more funds are authorized for this second largest DOE budget category, we should ask, "what has this money bought?" And perhaps more importantly, "what will the program buy in FY 1993?"

When the Administration released its FY 1993 Budget Request, President Bush held an Oval Office press conference at which he highlighted spending $5.5 billion

> ...to clean up and bring into compliance with environmental laws the various facilities of the Department of Energy.[3]

Unfortunately, our review of the budgetary fine print reveals that substantial amounts of the Administration's budget request are being diverted to non-environmental activities or non-essential environmental activities that support unneeded production. These misdirected funds reduce resources available for critical environmental cleanup and research projects.

We have appeared before this Panel each year since 1989 and requested that DOE's environmental funding be increased above the Administration's request. This year, however, we are concerned that the Department's ERWM program is diverting significant amounts of its

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[1] The FY 1990 ERWM budget was approximately $2.2 billion. DOE's FY 1993 budget claims that its ERWM budget has tripled since 1989 (See, Duffy, L.P., Testimony before House Energy and Water Appropriations Subcommittee, March 3, 1992). However, comparison with pre-FY 1990 budgets is not technically legitimate because of the significant recategorization of environmental budget categories that occurred after the FY 1989 budget was enacted. Approximately 64 percent of the FY 1989 ERWM budget was transferred from other program offices to the newly formed ERWM office, but a complete transfer did not occur until FY 1990 (See, Werner, J.D. and D.W. Reicher, Testimony before the Senate Government Affairs Committee, November 14, 1989.)

[2] FY 1990=$2.218 billion, FY 1991=$3.88 billion, FY 1992=$4.2 billion; FY 1993=5.3 billion requested.

[3] White House, Office of the Press Secretary, "Highlights of the President's Environmental Budget for Fiscal Year 1993," January 23, 1992.

environmental budget to non-environmental activities or to handling waste that would not be generated if DOE practiced some prudent source reduction. As a result of our analysis of DOE's FY 1993 Budget Request, we are not recommending an overall increase in DOE's Environmental Restoration and Waste Management (ERWM) budget. Instead, we recommend that Congress authorize the amount requested. However, the $5.5 billion must be substantially redistributed to increase environmental restoration funding by eliminating wasteful waste management spending.

We also urge Congress to take a number of specific steps to increase the accountability in the ERWM program:

- Require DOE to distinguish its ERWM spending for managing newly generated waste for spending for existing waste;
- Eliminate all funding for non-environmental projects in the ERWM budget;
- Better incorporate environmental considerations (including a waste and life-cycle analysis) in program decisions;
- Conduct annual reviews of major programs to audit costs required to handle the waste generated by each major project;
- Increase environmental restoration funding above the DOE request to stabilize waste sites, accelerate site characterization activities, and meet environmental compliance agreements;
- Request a study by the National Academy of Sciences of DOE's environmental technology development program and requirements;
- Provide adequate funding to reimburse EPA and state agencies for environmental oversight; and
- Direct EPA to develop standards for residual radioactivity.

In addition, we urge Congress to enact two key measures necessary to hasten DOE's transition from Cold War operations:

- eliminate unnecessary reprocessing of nuclear fuel and other materials; and
- establish programs to assist workers displaced by the shutdown of nuclear weapons facilities.

A. ACCOUNTABILITY

It has been nearly five years since the environmental, health and safety problems of the Energy Department's nuclear weapons complex, estimated to cost more than $100 billion to resolve, were thrust into national prominence. Since then DOE has reorganized and increased its budget to respond to the problems. Several external groups have issued numerous reports, studies and recommendations on these issues (See Table 1). We believe that Congress should now review whether the program DOE has developed is working effectively and efficiently. We also urge Congress to adopt a number of measures to improve DOE's environmental programs and its accountability to Congress and the public.

We will review each major ERWM program area to identify problems in each and propose possible solutions.

1. Waste Management - Reduce Wasteful Waste Spending.

The potential for the greatest savings in the Department's environmental budget can be realized, not surprisingly, where most of the environmental spending occurs - the handling, storage, treatment and disposal of waste generated as a result of production operations ("waste management"). For FY 1993, DOE has requested more than three billion dollars for waste management operations - nearly 60 percent of the ERWM budget request and a 27 percent increase over FY 1992 (See Figure 1).

Before authorizing these funds for FY 1993, Congress should ask, "How would this three billion dollars be spent?"

Table 1. Findings and Recommendations Regarding DOE Environmental, Safety and Health Issues

Research Organization	Date	Findings and Recommendations
Advisory Committee on Nuclear Facility Safety[1]	1991	Improve radiation protection and safety programs
		Develop a cleanup policy with specific objectives
		Implement a formal site-specific risk management program
		Develop risk analysis policy and guidance, especially for nonreactor nuclear facilities
Washington University[2]	1991	Create site-specific advisory boards for public participation.
Office of Technology Assessment (U.S. Congress)[3]	1991	Improve environmental and health data
		Improve public participation (national and site advisory boards)
		Need outside regulation of DOE radioactive materials (by EPA or NRC)
		Improve environmental technology development program
National Academy of Sciences[4]	1989	Improve collection, storage and analysis of health-related data on workers
		Improve the involvement of public and state officials in environmental issues
		Develop site-specific cleanup standards and risk assessment methodologies for decisions regarding extent of cleanup and priorities for environmental restoration
		Upgrade conventional safety programs and develop a coherent criticality safety program
National Academy of Sciences[5]	1987	Liquid effluents at N-reactor not adequately controlled
		Fund and participate in annual offsite emergency preparedness exercises with state and local governments
		Perform regular audits of contractor performance to assure compliance with DOE Orders
		Clarify safety objectives for operation of production reactors and provide adequate funds for implementation
General Accounting Office	1988 to 1992	GAO has published nearly 100 reports in three years on environment, safety and health issues at DOE facilities.
Environmental Evaluation Group	1979 to 1992	EEG has published 49 studies on the Waste Isolation Pilot Plant (defense nuclear waste facility in New Mexico)

[1] Advisory Committee on Nuclear Facility Safety, "Final Report on DOE Nuclear Facilities," November 1991, pp. 15-19.

[2] Taylor, Laura L. Center for Technology Assessment and Policy, Washington University, "Opening Up: Public Involvement in ES&H Issues at the DOE Nuclear Weapons Complex," Report Number 91-1, May 1991, p. 87.

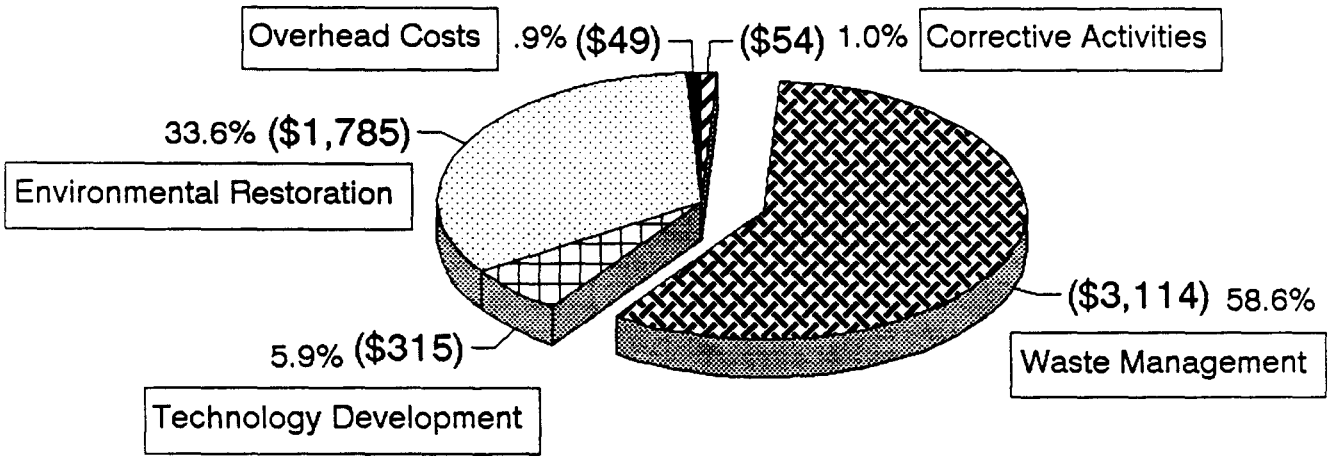
[3] OTA, "Complex Cleanup: The Environmental Legacy of Nuclear Weapons Production," OTA-O-484, February 1991, p. 10.

[4] National Academy of Sciences, The Nuclear Weapons Complex, December 1989, pp. 41-42, 52, 60, 66, 78.

[5] National Academy of Sciences, Safety Issues at the Defense Production Reactors, 1987, pp. 14, 18-19, 66, 69.

Figure 1.

FY 1993 ADMINISTRATION BUDGET REQUEST
($ Millions)



Source:
DOE, "Posture Statement and Fiscal Year 1993 Budget Overview," January 1992.

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a. New Waste or Old Waste?

The Energy Department has indicated in its FY 1993 Budget Request that the Waste Management budget is intended primarily for storage and treatment of existing waste and only a small amount of newly-generated waste.[6] However, in its presentation of the latest Five-Year Plan, DOE indicated, without citation or supporting analysis, that more than half of its waste management funding is directed to handling newly generated wastes from ongoing production facilities.[7] Despite numerous requests (See Attachment A) DOE has failed to provide any data or analysis supporting either assertion.

The question of how much waste management funding is devoted to handling existing stored wastes versus newly generated waste is fundamental to understanding the Energy Department's waste management budget. For example, to the extent that resources are devoted to handling new waste, the potential exists to save money by reevaluating whether the projects generating the waste are justified in light of the additional waste management costs. In the long run, an understanding of the relative importance of newly generated versus existing waste will be required to plan for new waste treatment facilities in a reconfigured DOE complex.

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[6] "...Waste Management is [for] management of a large volume of stored radioactive waste resulting from past operations [and] a relatively small volume of new radioactive, hazardous and sanitary waste resulting from current operations of DOE." DOE, FY 1993 Budget Request, Volume 5, p. 241.

[7] "Current Production, DP Waste" and "Current Production, Non-DP Waste" were estimated at 26 and 27 percent, respectively, of the total Waste Management "Validated Target Level" planning estimate. DOE, "Five-Year Plan (FY 1993-1997) Briefing Charts," September 1991.

b. Eliminate Environmental Activities That Support Unnecessary Projects.

Using ERWM funds to manage wastes for unnecessary production is the most troubling aspect of the ERWM budget request. It is a well-accepted waste management principle that the most effective waste management technique is "source reduction,"[8] i.e., elimination or reduction of a waste source in order to avoid handling the waste in the first place.[9] The Energy Department should make a full and honest appraisal of whether it is necessary to generate a waste before it proposes to spend money to manage the waste using "end of the pipeline" fixes. DOE should, at a minimum, explain what waste management funding will be used for - handling newly generated wastes versus existing stored wastes. With this information it will be possible to determine the potential for reducing waste management costs through source reduction.

Perhaps the clearest example of the misuse of waste management resources in support of unnecessary projects is the Idaho Chemical Processing Plant (ICPP) - a nuclear fuel rod reprocessing facility. The mission of the ICPP (known as the "Chem Plant") has been the recovery of highly enriched uranium (HEU) for use as fuel in the Savannah River production reactors[10] - a mission made obsolete by the burgeoning surplus of HEU from retired warheads combined with the declining need for the operation of the production reactors.

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[8] DOE continues to use the less inclusive term, "waste minimization," suggesting a failure to include waste generation considerations in program decision-making.

[9] Office of Technology Assessment, "Serious Reduction of Hazardous Waste," OTA-ITE-318, September 1986; Sarokin, D. et al., "Cutting Chemical Waste" INFORM, New York, NY 1985; Office of Technology Assessment, "Technologies and Management Strategies for Hazardous Waste Control," OTA-M-196, March 1983.

[10] The Chem Plant has provided uranium enriched to 78 percent U-235 to the Y-12 Plant in Oak Ridge, Tennessee where it is fabricated into driver (fuel) rods for the Savannah River reactors. The ICPP, however, has generally produced less than a tenth of the HEU used in driver rods at Savannah River, the vast majority (more than 80 percent) coming from on-site recycle at SRS. See Cochran, T.B. et al., "Nuclear Weapons Databook, Volume II: U.S. Nuclear Warhead Production," Ballinger Publishing Company, Cambridge, Massachusetts, 1987. p.71, and "Volume III: U.S. Nuclear Warhead Facility Profiles," p. 37.

Since it began operations in the early 1950s, the ICPP has produced hundreds of millions of gallons of hazardous and radioactive wastes annually. From 1953 to 1974, DOE discharged nearly 7 billion gallons of radioactive wastes to an underground injection well at an average rate of more than 300 million gallons annually -- nearly a million gallons a day.[11] In addition, 10,000 to 35,000 gallons of radioactive chemical wastes such as nitric acid raffinates, and 19,000 cubic feet of radioactive solid wastes were generated each year at the ICPP.[12] Because of significant modifications to increase the capacity of the ICPP, the volume of wastes currently generated by the ICPP have approximately doubled and have more recently been estimated to be as much as two million gallons of radioactive liquid waste daily.[13] Based on the uranium throughput during this period, for every cubic meter of U-235 processed, the ICPP produces 5,000 cubic meters of high level radioactive waste (HLW) and 17 million cubic meters of low level liquid radioactive waste (See Attachment B).

In addition, ICPP operation results in routine and accidental exposures of workers to radioactive and hazardous substances.[14] Therefore, unjustified operation of the ICPP violates the standard nuclear industry principle of keeping exposure levels "As Low As Reasonably Achievable."

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[11] Energy Research and Development Administration, "Waste Management Operations, Idaho National Engineering Laboratory," September 1977, ERDA-1536, September 1977, p. II-89.

[12] Energy Research and Development Administration, "Alternatives for Long-term Management of Defense High-Level Radioactive Waste, Idaho Chemical Processing Plant," ERDA 77-43, September 1977, p. A-16.

[13] DOE, "Environmental Assessment: Fuel Processing Restoration at the Idaho National Engineering Laboratory," DOE/EA-0306, August 1987, p. 2-14.

[14] See, e.g., Stubblefield, M.A., G.E. McDunnel and J.E. Hevlow, "Unusual Occurrence Report - ICPP, February 9, 1991," UOR # WINCO-91026, February 21, 1991.

Nonetheless, DOE has proposed to spend $364.1 million to continue operation and rebuilding of the ICPP in its FY 1993 Budget Request[15], and an additional $100 million for waste management operations.[16] Costs that cannot be determined for FY 1993 are those resulting from further environmental contamination or the increased need for disposal capacity.

c. Eliminate Non-Environmental Projects from the Environmental Budget.

In certain cases, operational costs of obsolete production facilities are being funded with ERWM funds through the waste management account. We have discussed these problems in previous appearances before this Panel. Hundreds of millions of dollars from the waste management account have been wasted on unnecessary projects. Congress needs to take stronger action to halt this misuse of environmental funds.[17]

The clearest case of environmental funds being spent on non-environmental projects is the "Plutonium Uranium Extraction Facility" (PUREX) at the Hanford Reservation in Washington State. PUREX is designed to chemically process nuclear fuel rods to produce plutonium for nuclear warheads.[18] Since it was built in the early 1950s, PUREX operations have been funded from the Nuclear Materials Production account within Atomic Energy Defense Activities. However, without adequate justification, DOE transferred operations and funding for PUREX to

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[15] Bugger, Brad, DOE/ID, Personal Communication with Beatrice Brailsford, Snake River Alliance, March 26, 1992.

[16] DOE, "FY 1993 Congressional Budget Request", DOE/CR-0006, Vol. 5, January 1992.

[17] In its FY 1993 budget, DOE created a new waste management category known as "Former Defense Program Facilities" ($236 million for FY 1993).

[18] In its Environmental Impact Statement on PUREX, DOE defined the "Purpose and Need" for PUREX as follows: "Pursuant to its programmatic responsibilities, one of which is to develop and maintain a capability to produce nuclear materials for the U.S. defense programs, DOE has determined that additional near-term chemical processing of irradiated fuels is necessary to meet plutonium requirements including research and development programs." "Draft Environmental Impact Statement, Operation of PUREX and Uranium Oxide Plant Facilities," May 1982, DOE/EIS-0089D, p.1.1.

the Office of Environmental Restoration and Waste Management as of the fourth quarter of FY 1991.[19] If this transfer was part of a program to shut down and decontaminate the facility then it could be justified, but PUREX is not funded as a decontamination project.[20] The Department's FY 1993 waste management budget request indicates that analyses are being conducted to support restart of PUREX "to process the N-reactor fuels currently stored in the 100K basins," which is the same mission the facility performed when it was funded under Nuclear Materials Production.[21] DOE's FY 1993 Budget Request includes more than $200 million for PUREX.

Another example of using ERWM funding for a non-environmental project is the Fast Flux Test Facility (FFTF), which was transferred to the ERWM account at the direction of the FY 1991 Energy and Water Appropriations Act. The FFTF is an experimental nuclear reactor and has little or no environmental mission that could justify the use of ERWM resources. DOE has requested $45 million for FY 1993 in its non-defense waste management budget for operation of the FFTF.[22] If FFTF were transferred to ERWM for decontamination and decommissioning it would be funded through the environmental restoration program, not the waste management program.

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[19] DOE "Congressional Budget Request, Volume 1, Atomic Energy Defense Activities," DOE/MA-0398, January 1990, p. 165. In part to avoid this problem in the future, ERWM recently established the Office of Transition Planning (EM-60) to establish environmental guidelines regarding the transfer of facilities to ERWM control.

[20] Decontamination and Decommissioning projects are not funded through the Waste Management program but are part of the Environmental Restoration program.

[21] DOE, "FY 1993 Congressional Budget Request," DOE/CR-0006, Vol. 5, January 1992, p. 366.

[22] DOE, "FY 1993 Congressional Budget Request," DOE/CR-0006, Vol. 5, January 1992, p. 134.

d. Congress' Response.

In light of this misuse of ERWM funds, we urge Congress to take two steps to increase DOE's accountability. First, DOE should be required to indicate the basic purpose of each waste management project. Specifically, each Activity Data Sheet (DOE's computerized form summarizing the annual budget and scope of each project) should contain information on whether, or to what extent, each project is intended to address: (1) newly generated waste from defense or non-defense operations; (2) existing waste being temporarily stored awaiting treatment or disposal; or (3) waste generated from environmental restoration activities.

Second, Congress should direct the Department to calculate the complete life-cycle environmental costs of any major program decision and to assess annually the environmental costs for continuing programs. The Department of Defense (DOD) has incorporated environmental considerations into its directives[23] and instructions[24] that require that "life cycle cost estimates must include the cost of acquiring, handling, using, and disposing of any hazardous or potentially hazardous materials."[25] Moreover, DOD requires that environmental considerations be "one of the mandatory elements that must be addressed at each of the weapons system Milestone Decision Reviews."[26] Although we are not suggesting these specific approaches as necessarily ideal models for DOE, they illustrate a method for integrating environmental considerations in decision making.

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[23] DoDD 5000.1, "Defense Acquisition"

[24] DoDI 5000.2, "Defense Acquisition Management Policies and Procedures"

[25] DoD, Deputy Assistant Secretary of Defense (Environment), "Environmental Considerations During Weapons Systems Acquisition, Report to Congress," September 1991, p. 1.

[26] Ibid., p. 2.

2. Environmental Restoration - More Funding Required For FY 1993.

While DOE spends substantial portions of the ERWM budget on non-environmental or nonessential environmental activities, we are concerned that important cleanup efforts ("environmental restoration"[27]) remain underfunded. Congress must ensure that a larger portion of DOE's $5.5 billion budget request for ERWM is devoted to environmental restoration activities.

The Department's FY 1993 budget request for environmental restoration is $1.38 billion.[28] Although substantial, the public relations attention given to this aspect of the Department's ERWM budget seems disproportionate to the actual funding level. The lead sentence of the Department's press release on its FY 1993 budget exaggerated the use of the ERWM budget for actual cleanup efforts: "[DOE's proposed budget] contains $5.5 billion for environmental cleanup at DOE facilities..."[29] The morning after an Oval Office press briefing on the Administration's FY 1993 environmental budget, the New York Times wrote that $5.5 billion was requested for "cleaning up pollution from the Energy Department's nuclear weapons

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[27] "Environmental restoration" involves cleanup of the approximately 3,600 sites where hazardous and/or radioactive waste have been dumped or leaked, and the decontamination and decommissioning of radioactively-contaminated facilities. These activities may include closures, and continuous release responses (section 3004(u)) conducted under RCRA as well as Superfund responses.

[28] DOE, "FY 1993 Congressional Budget Request," DOE/CR-0006, January 1992, p. 196. An additional $403.841 million was requested for environmental restoration activities in the Energy Supply Research and Development account which covers primarily non-defense sites. The total environmental restoration request was 32 percent of the ERWM total.

[29] DOE, "DOE Budget up for Environmental Cleanup...", R-92-022, January 29, 1992 [emphasis added]. The press release also failed to mention that approximately $200 million of this funding depends on a special "mill fee" imposed on customers of uranium enrichment services.

programs."[30] In fact, only 25 percent of the total ERWM budget request for FY 1993 is intended for environmental cleanup at defense facilities.

Certainly, many waste management and other environmental tasks are urgently needed, and must be funded. But referring to them as "cleanup" is misleading. It is no more accurate to characterize the ERWM budget as being used for "cleanup," than it would to be state that the ERWM budget is used for managing waste from, or operating, nuclear weapons production facilities. Yet, nearly $1 billion[31] of the Department's FY 1993 budget request is intended for these non-cleanup tasks. Congress should pay close attention to these distinctions between the different missions of ERWM and redirect funds accordingly.

a. Failure to Fund Environmental Restoration Adequately May Cause Serious Problems.

Our analysis of the FY 1993 ERWM budget indicates that the Department's budget request for FY 1993 is inadequate to meet the needs identified by Field Offices and reviewed by headquarters ("Preliminary Unvalidated Case"), or the needs identified after additional review by headquarters ("Program Planning Level"). The FY 1993 request is also inadequate to fulfill commitments made by DOE to regulatory agencies. It is unclear exactly how much additional funding is required to address these unmet needs. However, there seems to be little doubt that some additional funding is needed to meet minimal environmental requirements as well as to stabilize sites to prevent worsening conditions. Failure to fund legitimate cleanup work fully could result in a number of problems.

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[30] Cushman, John H., Jr., "Bush to Ask More for Base Cleanups", New York Times, January 24, 1992, p. A15.

[31] $2.829 billion (defense waste management) X 26 percent (proportion of WM account for handling newly generated waste based on DOE 5-Year Plan briefing) + $236 million (PUREX support).

First and foremost, environmental restoration is required to prevent short- and long-term human health and environmental risks. In most cases the nature and extent of contamination is not fully characterized. Analyses of contamination problems are necessary to prevent human or environmental exposures to contaminants[32] and to plan effective remedies.

Second, delays in environmental restoration projects caused by underfunding could result in violations of environmental laws, regulations, and agreements. For example, under the 1986 Superfund amendments, federal facilities must undertake remedial investigations and actions within a prescribed period.[33] In addition, more specific timetables are dictated by interagency cleanup and compliance agreements.

Third, delays in environmental restoration projects could allow continued spreading of contamination resulting in growth in the size and cost of eventual cleanup.[34]

b. Near-term Funding is Needed to Stabilize Sites.

Interim remedies[35] and expedited site investigations are urgently needed in the near-term to stabilize sites to prevent contamination from spreading. The usefulness of interim remedies was one of the most important lessons learned from the Superfund cleanup program in

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[32] As an example, DOE's failure to conduct adequate characterization resulted in the continued use of drinking water wells by residents living near the Paducah and Fernald sites after DOE had obtained preliminary findings of contamination with solvents and uranium, respectively. DOE, "Environmental Survey Preliminary Report[s]: Feed Material Production Center," March 1987, and "Paducah Uranium Enrichment Plant," January 1989, DOE/EH/OEV-20-P.

[33] Superfund Amendments and Reauthorization Act of 1986, Section 120(e).

[34] An important exception is the necessary delay for many decontamination and decommissioning projects. At many facilities, especially reactors, radioactive decay must be allowed to occur for several years before the facilities can be safely decontaminated and decommissioned.

[35] Techniques used to stabilize the spread of contamination and to reduce any short-term risks such as fire and explosion.

the 1980s. Interim remedies are cleanup measures that can be taken now to halt or slow the spread of contaminants in groundwater and soil. Because of the overwhelming scope of cleanup needs at DOE facilities, it makes a great deal of sense to employ interim remedies at some sites.[36]

For example, the spread of contaminated groundwater can be halted or slowed by "counterpumping," using strategically located wells. Also, "hotspots" of highly contaminated soil or sludge can be removed to eliminate the original source of the contamination thereby stemming its spread into the ground, air or waterways. The use of interim remedies has been recommended by the Office of Technology Assessment[37] and by private contractors with significant experience in the Superfund program.[38] DOE has begun to use interim remedies at some sites. For example, in cooperation with the Washington State Department of Ecology and the EPA, DOE has been performing expedited response actions at the Hanford site. However, as discussed below, these kinds of actions appear to lack full funding in the ERWM FY 1993 budget request.

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[36] Three important considerations must be weighed in using interim remedies: (1) interim remedies should not be used as a substitute for permanent remedies; (2) distinct decision-making processes should be used for the interim and the permanent remedies so that interested citizens will have an opportunity to comment on both phases; (3) the implementation of an interim remedy should not interfere with any planned long-term remedy. For example, soil covers should be avoided in cases where subsequent exhumation of wastes might be necessary because excavation through this type of cover is more difficult and expensive. Such an interim remedy should also be avoided because it might serve as a disincentive for implementing the final cleanup. (See generally, NRDC, EDF, et al. Right Train, Wrong Track: Failed Leadership in the Superfund Cleanup Program. June 20, 1988.)

[37] Office of Technology Assessment (U.S. Congress), Superfund Strategies. April 1985, p. 39.

[38] See e.g., testimony of William A. Wallace (CH2M Hill, Inc.) and Gary A. Dunbar (CDM, Inc.) before the House Energy and Commerce Committee Subcommittee on Commerce, Tourism, and Transportation, 1983, Ser. No. 98-128.

c. DOE's FY 1993 Budget Request Fails to Include Adequate Environmental Restoration Funding.

As DOE officials have described in testimony, the FY 1993 ERWM budget request has undergone an extraordinary amount of review by the Office of Management and Budget, the U.S. Army Corps of Engineers, numerous levels of the Energy Department, and other federal agencies. Congress should acknowledge and take advantage of this valuable analytical effort. Although we have substantial concerns, expressed below, about this review, many areas of the Federal Budget could benefit from this kind of "scrubbing."

As a result of the detailed budget review, DOE asserts,

> [E]ach agency represented [DOE, EPA, OMB, and the Departments of the Army, Defense and Justice] expressed confidence that the environmental restoration and waste management program, including activities funded under the uranium enrichment account, can be funded at the $5.534 billion level for 1993.[39]

We do not dispute that, if spent effectively, this total ERWM funding level could be adequate for FY 1993. However, the problem is that certain parts of the ERWM budget, such as waste management, are being misspent, while other areas, particularly environmental restoration, are being underfunded. To understand how we arrive at this conclusion, it is useful to review briefly how DOE's budget was developed for FY 1993.

At least four different funding levels were developed for DOE's FY 1993 ERWM budget (See Table 2) - the fourth and final level was used as the Administration's FY 1993 Budget request. The first estimate of DOE's funding needs was developed on the basis of field office submittals to headquarters in January 1991. These estimates of ERWM funding needs were subject to program and cost reviews by DOE Headquarters. After these initial reviews, DOE

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[39] Duffy, Leo P., DOE, "Statement before the House Energy and Water Appropriations Subcommittee", March 3, 1992.

Table 2.

COMPARISON OF ENERGY DEPARTMENT'S ERWM(a) BUDGET REQUEST WITH OTHER FUNDING LEVELS FOR FY 1993
($ Billions)

	Request or Estimate	FY 1993 Surplus (Shortfall)	Percentage Surplus (Shortfall)
Administration Budget Request (b)	5.316	-	-
DOE Five-Year Plan (c)	6.817	(1.501)	(22%)
DOE Program Planning Level (d)	5.8	(0.5)	(8.6%)
OMB Target Funding Level (d)	4.669	0.647	13.9%

Notes:

a. Environmental Restoration and Waste Management

b. DOE, "FY 1993 Congressional Budget Request," Volume 5, DOE/CR-0006, pp.3, 17.

c. DOE, "Environmental Restoration and Waste Management Five-Year Plan, FY 1993-1997," DOE/S-0090P, August 1991, p. 31. The estimates were referred to as "Preliminary Unvalidated Case" (PUC).

d. Duffy, Leo P. Memorandum to the Secretary, through the Under Secretary, "Re: ACTION: Appeal of FY 1993 Internal Review Budget (IRB) Allocation for the [ERWM] Program," September 4, 1991.

released, on September 5, 1991, an estimate of $6.693 billion, called the "Preliminary Unvalidated Case" (PUC), required to meet environmental requirements in the Department's Five-Year Plan.[40] A second funding level, which was also included in DOE's Five-Year Plan, was set at $4.88 billion for planning purposes.[41] This "Validated Target Level" (VTL) was based on a simple ten percent increase over the FY 1992 ERWM budget. This planning estimate was essentially the same as the $4.669 billion target funding level determined by the Office of Management and Budget (OMB) for the Internal Review Budget.

In September 1991, the Department's ERWM office appealed the OMB target level as insufficient

> ... to allow the Department to meet its legal requirements, environment, safety, and health[]-related actions required by DOE orders, and related essential (but, for the purposes of this evaluation, discretionary) activities.[42]

DOE developed a third ERWM funding level to try to address increasing concerns about the validity of the cost estimates and to reconcile the substantial budget shortfalls between field estimates and the OMB target. Based on additional internal reviews of projects submitted by field offices, DOE developed an intermediate $5.8 billion (between the PUC and the OMB target levels) "Program Planning Level" (PPL). Even this PPL, the Department predicted, would not be adequate to meet legally required activities (See Attachment C). For example, DOE estimated that this funding level would result in delays in projects covered by nine Activity Data Sheets at

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[40] DOE, "Environmental Restoration and Waste Management Five-Year Plan, FY 1993-1997", DOE/S-0090P, September 1991, p. 31.

[41] DOE, "Environmental Restoration and Waste Management Five-Year Plan, FY 1993-1997", DOD/S-0090P, September 1991, p. 31.

[42] Duffy, Leo P., Memorandum to the Secretary, through the Under Secretary, "Re: ACTION: Appeal of FY 1993 Internal Review Budget (IRB) Allocation for the [ERWM] Program", September 4, 1991. The next day Mr. Duffy released the ERWM Five-Year Plan. It is unclear what the OMB estimate was based on since the "Validated Target Level" indicated in DOE's Five-Year Plan was $4.88 billion, which resulted from adding ten percent to the FY 1992 budget level.

the Savannah River Site, including field remediation of the M-Area waste disposal and a transuranic and mixed waste disposal facility. At the Idaho National Engineering Laboratory, the removal of 34 potentially leaking underground storage tanks would be delayed.

DOE's concerns regarding the difference between its budget estimate and the OMB target level were heightened on September 5, 1991 when a Department of Justice opinion was signed reiterating to DOE that, "the head of each executive agency shall ensure that sufficient funds are requested in the agency budget" to meet applicable environmental requirements.[43]

To resolve the dispute between DOE and OMB, two groups of budget teams were dispatched to review the Activity Data Sheets on which the budgets were based to determine whether the budget estimates were adequate to meet legal commitments and were reasonable technical estimates. One group was assembled by DOE, the "Independent Cost Estimating" (ICE) group, primarily composed of DOE contractors. Another group was formed by OMB with assistance from the Army Corps of Engineers.[44] In only eight weeks, these groups reviewed thousands of Activity Data Sheets to try to determine an adequate ERWM budget for meeting legal requirements.

The results of these reviews were used as a basis for the Administration's FY 1993 Congressional Budget Request of $5.3 billion[45] - about a half billion dollars <u>less</u> than the Program Planning Level - itself determined by DOE to be inadequate after two reviews. In addition, the FY 1993 total ERWM budget request is approximately 22 percent ($1.5 billion) less than the "Funding Needs" indicated by the field offices (See Table 3). The shortfall is particularly disturbing for environmental restoration ($745 million; 29 percent) (See Table 4). For the

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[43] Hartman, B., DOJ, Letter to W. H. Moore, DOE, September 5, 1991. This letter reiterated Executive Order 12088.

[44] Grady, Robert E., OMB, Letter to N.P. Dorn, Assistant Secretary for Civil Works, Army, September 26, 1991.

[45] Excluding funding to be obtained through a proposed mil fee on uranium enrichment customers.

Table 3.

TOTAL ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT BUDGET (a)

COMPARISON OF ENVIRONMENTAL FUNDING NEEDS
WITH DOE'S FY 1993 BUDGET REQUEST
($ thousands)

SITE NAME	FY 1993 FUNDING NEEDS TOTAL (b)	FY 1993 BUDGET REQUEST (c)	FY 1993 SURPLUS (SHORTFALL)	PERCENTAGE SURPLUS (SHORTFALL)
Kansas City Plant	17,731	17,621	(110)	-1%
Los Alamos	180,652	159,904	(20,748)	-11%
Mound Plant	45,522	41,114	(4,408)	-10%
Pantex Plant	45,850	45,850	0	0%
Pinellas	13,433	12,525	(908)	-7%
Sandia Labs.(d)	59,993	49,215	(10,778)	-18%
INEL	452,273	428,313	(23,960)	-5%
Nevada Ops.	80,690	56,526	(24,164)	-30%
Fernald	471,977	307,933	(164,044)	-35%
Oak Ridge Nat. Lab	222,505	198,827	(23,678)	-11%
Y-12 Plant	130,623	125,514	(5,109)	-4%
Hanford (e)	1,518,326	1,355,204	(163,122)	-11%
Rocky Flats	279,058	278,644	(414)	-0%
Savannah River (f)	799,009	644,916	(154,093)	-19%
TOTAL (g)	6,817,860 (h)	5,316,703 (i)	(1,501,157)	-22%

Notes:

a. Includes Environmental Restoration, Corrective Activities, and Waste Management.
b. DOE, "Environmental Restoration and Waste Management Five-Year Plan, FY 1993-97," DOE/S-0090P, August 1991, pp. 31, 357, 361, 365, 369, 373, 377, 381, 417, 427, 440, 456, 462, 484, 490, 517.
c. DOE, "FY 1993 Laboratory Table," February 1992, pp. 26, 32, 38, 47-48, 51, 54, 60-61, 72, 76-77, 82, 85, 90, 94, 118.
d. Includes Sandia Albuquerque (NM) and Livermore (CA).
e. Includes Richland Ops., Hanford Engineering & Development Lab, and PNL.
f. Includes Savannah River (SR) Ops., SR Laboratory, and SR Plant.
g. Site funding levels do not add to Total because of the inclusion of sites with primarily non-defense missions and Technology Development, Transportation Management, and Program Direction Funding in the Total.
h. Excludes Environmental Restoration funding needs that DOE proposed to be funded through the Office of Nuclear Energy/Uranium Enrichment funded by a fee on electric utilities obtaining enrichment services.
i. DOE, "FY 1993 Congressional Budget Request," Volume 5, DOE/CR-0006, January 1992, pp. 17, 175.

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Table 4.
ENVIRONMENTAL RESTORATION (a)

COMPARISON OF ENVIRONMENTAL FUNDING NEEDS
WITH DOE'S FY 1993 BUDGET REQUEST
($ thousands)

SITE NAME	FY 1993 FUNDING NEEDS TOTAL (b)	FY 1993 BUDGET REQUEST (c)	FY 1993 SURPLUS (SHORTFALL)	PERCENTAGE SURPLUS (SHORTFALL)
Kansas City Plant	7,935	7,770	(165)	-2%
Los Alamos	96,016	73,818	(22,198)	-23%
Mound Plant	35,893	31,485	(4,408)	-12%
Pantex Plant	29,050	29,050	0	0%
Pinellas	10,861	9,953	(908)	-8%
Sandia Labs.(d)	39,837	29,059	(10,778)	-27%
INEL	78,554	77,718	(836)	-1%
Nevada Ops.(e)	58,646	35,177	(23,469)	-40%
Fernald	471,977	307,933	(164,044)	-35%
Oak Ridge Nat. Lab	101,809	89,997	(11,812)	-12%
Y-12 Plant	58,818	55,734	(3,084)	-5%
Hanford (f)	236,604	184,988	(51,616)	-22%
Rocky Flats Plant	155,112	161,120	6,008	4%
Savannah River (g)	76,647	65,792	(10,855)	-14%
TOTAL (h)	2,530,000	1,784,511 (i)	(745,489)	-29%

Notes:

a. Environmental Restoration is defined as the "assessment and cleanup of facilities and sites that are no longer a part of active operations [and includes] remedial actions and decomtamination and decommissioning (D&D)." DOE, "Environmental Restoration and Waste Management Five-Year Plan, FY 1993-97," DOE/S-0090P, August 1991, p. 210.

b. Ibid, pp. 32, 357, 361, 365, 369, 373, 377, 381, 417, 427, 440, 456, 462, 484, 490, 517.

c. DOE, "FY 1993 Laboratory Table," February 1992, pp. 26, 32, 38, 47-48, 51, 54, 60-61, 72, 76-77, 82, 85, 90, 94, 118.

d. Includes Sandia Albuquerque (NM) and Livermore (CA).

e. Includes Nevada Test Site and Ops. Office.

f. Includes Richland Ops., Hanford Engineering & Development Lab, and PNL.

g. Includes Savannah River (SR) Ops., SR Laboratory, and SR Plant.

h. Site funding levels do not add to Total because of the inclusion of sites with primarily non-defense missions in the Total.

i. DOE, "FY 1993 Congressional Budget Request," Volume 5, DOE/CR-0006, January 1992, pp. 33, 193.

Savannah River Site, the total shortfall relative to the "Funding Needs" assessment would be $154 million (19 percent). For the Fernald site, the shortfall would be $164 million (35 percent)[46]. The apparent shortfall for waste management is less significant, especially in light of the unnecessary and non-environmental projects included in the budget (See Table 5).

The report describing the budget review and reconciliation process, which was used to develop the budget, is not yet available, but some site-specific reviews have been prepared by Regional EPA offices based on briefings by OMB/Army Corps teams. These reviews provide some insight into the adequacy of the interagency review and the resulting FY 1993 budget request.[47] These reviews indicate that the budget request is inadequate for two reasons: (1) it fails to include funding for all necessary projects, and (2) fails to provide adequate funding for the projects that were included.

At the Hanford site, EPA engineers identified four "legal requirements that will not be met by the OMB/Army Corps funding classification:"[48]

1. Deadlines for specific accomplishments for the cleanup of Six "Operable Units" (waste sites);
2. "Expedited Response Action" at the "N-Spring" ($9.63 million for FY 1993);[49]
3. Low-level mixed waste laboratory and lab upgrade requirements; and

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[46] The shortfall between the FY 1993 Budget Request and the estimates of waste management needs in the Five-Year Plan was only $606 million (16 percent) (See Table 5).

[47] Contrary to DOE's assertion, few states were given an opportunity to review the DOE or OMB budget estimates. In particular, Washington State was not given an opportunity to review the budget request for Hanford; hence, the waste management sections of the budget were not reviewed for Hanford. Also, some EPA Regional offices, such as the Atlanta office, which oversees the Savannah River Site, have not yet fully analyzed the Administration funding request to determine whether milestones in the agreement would be funded.

[48] Sherwood, Douglas, EPA Reg X, Memorandum to William Duncan, EPA HQ, "Review of OMB/CE Funding Classification for Hanford", December 16, 1991.

[49] Ironically, DOE uses this underfunded activity presents the Expedited Response Action in its FY 1993 budget testimony as an example of progress. (Duffy, L.P., Testimony Before the House Energy and Water Appropriations Subcommittee, March 3, 1992.)

Table 5.

WASTE MANAGEMENT (a)

COMPARISON OF ENVIRONMENTAL FUNDING NEEDS
WITH DOE'S FY 1993 BUDGET REQUEST
($ thousands)

SITE NAME	FY 1993 FUNDING NEEDS TOTAL (b)	FY 1993 BUDGET REQUEST (c)	FY 1993 SURPLUS (SHORTFALL)	PERCENTAGE SURPLUS (SHORTFALL)
Kansas City Plant	7,060	7,060	0	0%
Los Alamos	74,256	76,706	2,450	3%
Mound Plant	9,629	9,629	0	0%
Pantex Plant	16,800	16,800	0	0%
Pinellas	2,572	2,572	0	0%
Sandia Labs. (d)	17,916	17,916	0	0%
INEL (e)	373,719	350,595	(23,124)	-6%
Nevada Ops.	22,044	21,349	(695)	-3%
Fernald	0	0	0	-
Oak Ridge Nat. Lab	104,296	92,430	(11,866)	-11%
Y-12 Plant	70,775	68,750	(2,025)	-3%
Hanford (f)	1,279,267	1,167,761	(111,506)	-9%
Rocky Flats	123,946	117,524	(6,422)	-5%
Savannah River (g)	722,362	579,124	(143,238)	-20%
TOTAL (h)	3,720,000	3,113,892 (i)	(606,108)	-16%

Notes:

a. Waste Management is defined as "the management of the waste generated by DOE's processing, manufacturing, research activities, and site cleanup activities using appropriate treatment, storage, and disposal (TSD) technologies." DOE, "Environmental Restoration and Waste Management Five-Year Plan, FY 1993-97," DOE/S-0090P, August 1991, p. 160.

b. Ibid, pp. 32, 357, 361, 365, 369, 373, 377, 381, 417, 427, 440, 456, 462, 484, 490, 517.

c. DOE, "FY 1993 Laboratory Table," February 1992, pp. 26, 31-32, 38, 47-48, 51, 54, 60-61, 72, 76-77, 82, 85, 90, 94, 118.

d. Includes Sandia Albuquerque (NM) and Livermore (CA).

e. Includes INEL-WINCO and EG&G.

f. Includes Hanford Reservation only.

g. Includes Savannah River (SR) Ops., SR Laboratory, SR Plant.

h. Site funding levels do not add to Total because of the inclusion of sites with primarily non-defense missions in the Total.

i. DOE, "FY 1993 Congressional Budget Request," Volume 5, DOE/CR-0006, January 1992, pp. 106, 244.

4. Single-shell tank characterization requirements.

At the Rocky Flats Plant, EPA and state engineers who reviewed a draft OMB/Army Corps analysis described as "misleading" the finding that "the DOE budget request of $168 million is adequate to meet all activities identified as mandatory by DOE in the September 4, 1991 study."[50] Apparently, the budget request failed to consider multi-year activities that need to be funded in FY 1993 to meet FY 1994 deadlines. Combined with the unmet FY 1993 needs, failure to fund these interim milestone requirements could result in a "bow wave," which will grow with accumulating budget shortfalls. In addition, the regulators found technical errors in the OMB/Army Corps review[51].

In addition to failing to account fully for required cleanup projects, the OMB/Army Corps review cut funding for cleanup projects based on economization attempts that were not necessarily technically warranted. For example, the OMB cost review relied on industry cost estimation manuals, which have been found to be inapplicable to work on hazardous waste cleanup and treatment facility construction projects.[52]

The most serious problem with this budget analysis is that, although useful, it misses the forest for the trees. While OMB and the Army Corps of Engineers scrutinized DOE's budget to save $9.24/hour for an apprentice versus a journeyman pipefitter, the reviewers remained silent on hundreds of millions of dollars wasted on entire facilities such as PUREX, FFTF or the ICPP.

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[50] Hestmark, Martin, EPA, Reg. VIII, Memorandum to Bob Carr, EPA HQ, "OMB/DOE Briefing Material - Rocky Flats", December 16, 1991. This EPA review confirmed that the PPL was inadequate to meet legally required commitments.

[51] For example, according to EPA, the review team mistakenly categorized an interim treatment project with an April 1992 deadline as a nonessential project for "FY 1998." Ibid.

[52] The OMB/Corps review relied on the "Means Construction Cost Manual", which fails to consider the additional health and safety requirements for workers at a hazardous waste site, or stringent QA/QC standards for building high hazard facilities. See generally, EPA, "Remedial Responses at Hazardous Waste Sites", EPA/540/2-84-002a, March 1984; and EPA, Compendium of Costs of Remedial Technologies at Hazardous Waste Sites, February 1984.

Although we strongly support all attempts to improve the efficiency of the ERWM program, it is penny-wise and pound foolish to focus only on details of cost estimation, and ignore larger issues.

3. Technology Development - More Funding/Better Focus Needed.

The Office of Technology Development budget has doubled in three years from $183 million in FY 1990 to $303 in FY 1992. The FY 1993 request ($315 million) remains essentially flat in constant dollars.[53]

Dollar-for-dollar, the ERWM Office of Technology Development (OTD) is probably the Energy Department's most important environmental office. Through research and development (R&D), this office has the potential to expedite, improve, and, possibly, reduce the costs of the environmental cleanup of the nuclear weapons complex. Ultimately, the overall pace of permanent cleanup will likely be limited by the rate of progress in developing new technologies. Hence, OTD is vital beyond the dollars spent directly on the program. Because of the multiplier effect of dollars invested in this office, it is particularly crucial that R&D dollars be spent wisely. Yet, there is substantial doubt that the full potential of this office will be fulfilled. The role of OTD should be examined carefully and a number of changes should be considered to help ensure that DOE's environmental research dollars are used wisely. Unfortunately, we have found a number of examples of DOE spending its environmental research program funds for non-environmental projects.

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[53] By contrast, the EPA research and development budget for FY 1993 is $525.9 million (6 percent over FY 1992 budget).

One example of misspent R&D funds is the development of fuel processing technology for the New Production Reactor.[54] More than $12 million was budgeted in both FY 1991 and 1992 for a pilot scale demonstration of a technology to process graphite fuel from the Fort St. Vrain reactor - a commercial plant in Colorado. As the "Technical Task Plan" indicates, "[t]his technology is applicable to the New Production reactor - Modular High Temperature Gas Cooled Reactor."[55] If there is a need to develop a fuel processing technology for graphite fuel, then it should be funded from the nuclear materials production account of Atomic Energy Defense Activities, not the OTD account in ERWM.

Another example of the misuse of DOE's environmental research program is a project to develop a new technology for reprocessing spent nuclear fuel. As the Technical Task Plan for this project explains, reprocessing is used to obtain uranium for "fresh fuel" and for "plutonium production." To justify funding this project from an environmental account, this $21.5 million project is promoted for its "waste reduction"[56] benefits.[57] In light of the massive surplus of plutonium and uranium, and Secretary Watkin's decision to eliminate fuel reprocessing from any future nuclear weapons complex reconfiguration,[58] funding of such research does not appear to be justified compared to other research needs.[59]

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[54] Reprocessing of production reactor fuel has historically been used to reuse the highly enriched uranium in the fuel.

[55] DOE/OTD - Westinghouse Idaho Nuclear Company, "Fort St. Vrain Project", ID-1501-C1, January 29, 1991, p. 10.

[56] The term, "waste minimization", is used to indicate a more narrow scope than "source reduction," which includes process elimination.

[57] Office of Technology Development, "Technical Task Plan: A Dry Fluoride Volatility Process for Nuclear Fuel Reprocessing", TTP No.; AL-NEWPB, February 19, 1990

[58] Watkins, James D., DOE, Memorandum to Assistant Secretary for Defense Programs, et al., Highly Enriched Uranium Task Report, February 24, 1992.

[59] In theory, such a technology could be used to separate long-lived isotopes from high level waste, and produce a PuF_6 vapor form more physically amenable to transmutation. However, no such mission or orientation appears in the description of the program goals.

A recent review of OTD by the General Accounting Office identified a number of management problems:[60]

- OTD lacks measurable performance goals;
- OTD has not established overall cost estimates and schedules; and
- OTD has not identified key decision points to assess whether it makes sense to continue a research program.

The GAO report did not include certain broader considerations regarding the selection of projects for environmental research funding. For example, a recent OTD project conducted at the Oak Ridge Y-12 plant regarding uranyl nitrate (UNH) waste minimization during uranium processing included, as GAO recommends, measurable performance goals, schedules, costs estimates and identified key decision points.[61] However, there does not appear to be any consideration of the relative importance and need for a new processes to convert enriched UNH to a metal. In light of the Department's plans to eliminate reprocessing, which generates the UNH solutions, this research is not a legitimate priority compared with developing new cleanup or analytical technologies.

A number of fundamental management problems have led to this diversion of OTD resources to low-priority and non-environmental research. First, the Department's OTD program does not adequately reflect high-priority environmental problems at specific sites. Second, the "Roadmap" process discussed by DOE,[62] which could be useful in focussing OTD research more

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[60] Rezendes, Victor S., GAO, "DOE Management of Environmental Cleanup Technology", Testimony Before the Subcommittee on Environment, Committee on Science, Space and Technology, U.S. House of Representatives, GAO/T-RCED-92-9, February 26, 1992.

[61] Koger, J.W. and S.R. Churnetski (Oak Ridge Y-12/Martin Marietta, "Uranium Waste Stream Waste Minimization Strategic Plan," Y/WP-0003, May 30, 1991.

[62] DOE's "Roadmap Process" is a management process to identify and prioritize environmental needs, and to match them with potential research solutions at the appropriate time. Perhaps because OTD is the newest element of the

(continued...)

effectively, appears to be operating only on a site-specific level. Finally, OTD has failed to coordinate adequately with other federal agencies performing environmental research to eliminate duplication, improve cooperation, and enhance peer review.

These problems need to be addressed by resolving some fundamental technical and policy questions about the role and operations of OTD. These include:

- What portion of OTD funding should be devoted to technologies for,
  - storing and treating newly generated wastes;
  - storing and treating existing stored wastes; and
  - environmental restoration?
- Should OTD funds be used to develop new defense nuclear materials production technologies with a "waste minimization" environmental benefit?
- How should OTD balance its role as a service organization for other program offices versus serving as an independent organization to identify technology development needs?
- How should OTD balance short-term versus long-term research needs?
- To what extent should OTD use National Laboratories versus private university or commercial laboratories?
- Should OTD focus on environmental problems unique to DOE, general U.S. environmental research, or global environmental concerns?

Other government Agencies, such as the National Science Foundation, and the Environmental Protection Agency (EPA) as well as a variety of private companies face similar questions. It would be instructive to review the management of research and development at other organizations for lessons that may be applied to DOE. The General Accounting Office and the Energy Engineering Board of the National Research Council/National Academy of Sciences

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[62](...continued)
ERWM program, proposals such as this discussed in the DOE Five-Year Plan have not yet been broadly implemented (DOE/S-0090P[89], August 1991, p. 283.)

have published positive reviews of the R&D program of the Gas Research Institute (GRI).[63] These reviews identified several management practices that might be usefully applied to DOE research. Without necessarily endorsing any specifics of GRI's program, it seems clear that part of GRI's success results from the extraordinary effort devoted to tracking, at various levels, R&D dollars and project performance.

Congress could take two steps to help focus OTD on its valuable mission. First, Congress could request a study by the National Academy of Sciences (NAS) that would: (1) examine DOE's ERWM research program, and similar efforts in the public and private sector; (2) recommend a process for setting priorities for future DOE ERWM research; and (3) recommend a framework for managing the program. Second, Congress might direct DOE to establish its own OTD advisory committee which could begin addressing these issues and coordinate the work of smaller sub-groups created to review individual projects. The ERWM advisory committee, which is currently being established, might also be a useful mechanism for addressing some of these issues.

4. Fully-Funded EPA and State Oversight is Required To Ensure That Environmental Requirements Are Met And That Funds Are Spent Wisely.

The proposed FY 1993 budgets for the Environmental Protection Agency (EPA) and state oversight of Energy Department facilities are inadequate. Without sufficient funding for regulatory agencies, many cleanups and waste management projects will be delayed due to backlogs in review and approval. Moreover, stringent external independent oversight is necessary to ensure that the billions of dollars being committed to DOE environmental restoration program

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[63] Edelstein, Ronald B., Gas Research Institute, Testimony Before the Subcommittee on Environment, Committee on Science, Space and Technology, U.S. House of Representatives, February 26, 1992.

are spent wisely and that five or tens years from now we are not facing the need to spend more money to correct the original cleanups because of technical or management flaws.

Because most of the environmental restoration work currently being performed primarily involves investigation and planning, rather than actual remedial construction, now is the time for stringent oversight and review of decisions that will determine the use of larger sums for expensive remedial construction projects. A scandal in 1999 may be avoided by timely investment in effective oversight in 1991.

EPA's FY 1993 budget request identified "Federal Facilities Enforcement" as a "Material Weakness" requiring "Corrective Actions." According to EPA, "the Agency does not have sufficient resources to perform an adequate level of oversight of other agencies' environmental compliance and restoration plans and activities."[64] Moreover, the Agency noted that "[t]he sheer magnitude, impact, and political realities of the base closure program could easily consume the entire Federal Facilities resource base during this period."[65]

Oversight costs are typically estimated at approximately 2 to 4 percent of the costs of the cleanup. Hence, based on an FY 1993 DOD and DOE environmental restoration and waste management budget of more than $7.3 billion, the budget for oversight of the Energy Department's environmental restoration activities should be $150 to 300 million (See Table 6). Unfortunately, the EPA federal facilities oversight budget for FY 1993 is only $46.4 million - just 0.63 percent of the DOE/DOD waste cleanup budgets (See Figure 2). Moreover, while the DOE and DOD waste cleanup budgets increased from FY 1992 to FY 1993 by 26 and 44 percent, respectively, the EPA oversight budget <u>declined</u> by one percent (See Figure 3). In addition, tens

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[64] EPA, "FMFYIAI, Attachment D, Material Weakness/Corrective Actions", p.1, January 1992.

[65] Ibid., p.2.

Table 6. Comparison of EPA to Defense & Energy Department Environmental Funding FY 1989-1993
($ Millions)

	FY 1989(a)	FY 1990(a)	Percent Increase (FY89-90)	Approp. Funding FY 1991(a)	Percent Increase (FY90-91)	Approp. Funding FY 1992(b)	Percent Increase (FY91-92)	Budget Request FY 1993(c)	Percent Increase (FY92-93)
Energy Dept.(d)	1,687.5	2,444.5	44.9%	3,232.2	32.2%	4,208.0	30.2%	5,316.7	26.3%
Defense Dept.(e)	501.0	601.0	20.0%	1,162.0	93.3%	1,404.0	20.8%	2,027.0	44.4%
EPA (Oversight)	-(f)	28.0	-	28.0	0.0%	46.9	67.7%	46.4	-1.0%
EPA Percent of of DOE+DOD	-	0.92%		0.64%		0.84%		0.63%	

a. Appropriation for relevant fiscal years includes Atomic Energy Defense Activities; Energy Supply Research and Development; and Uranium Enrichment.
b. DOE FY 1992 Budget Congressional Budget Request", DOE/CR-001, Vols.I&II February 1991. [Final appropriated amount was approximately $108.5 less than requested, but allocation of cuts had not been determined.]
c. DOE, "Posture Statement and FY 1993 Budget Overview", DOE/CR-007, January 1992.
d. Includes Environmental Restoration and Waste Management Activites.
e. Includes Defense Environmental Restoration Program and Base Closures Cleanup Account.
f. EPA's Federal Facilities Compliance Office was established in 1990. This office is responsible for oversight of all federal facilities; not just DOE and DOE. Hence, this comparison may understate EPA's oversight responsibilities.

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February 28, 1992

Figure 2.

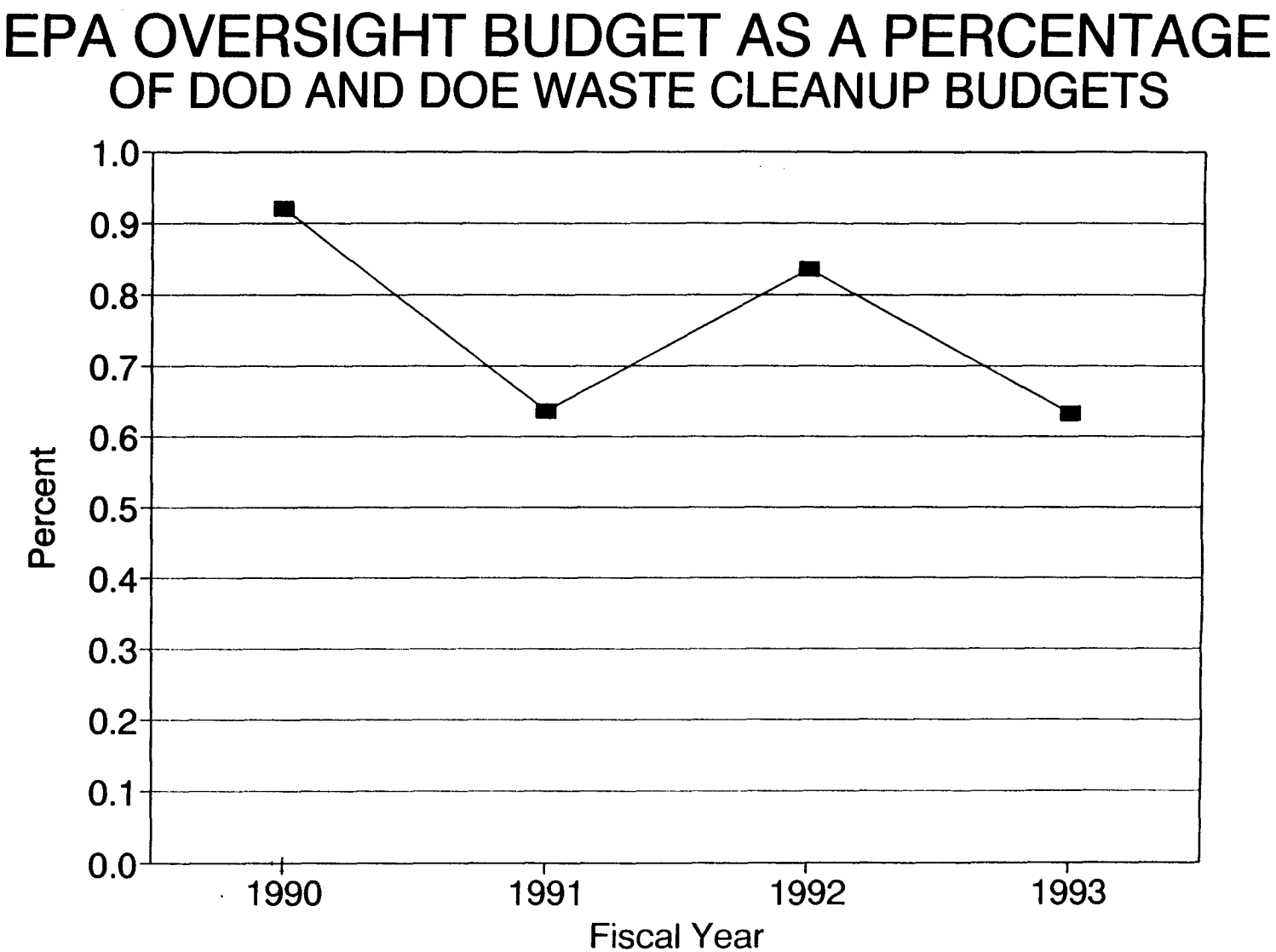

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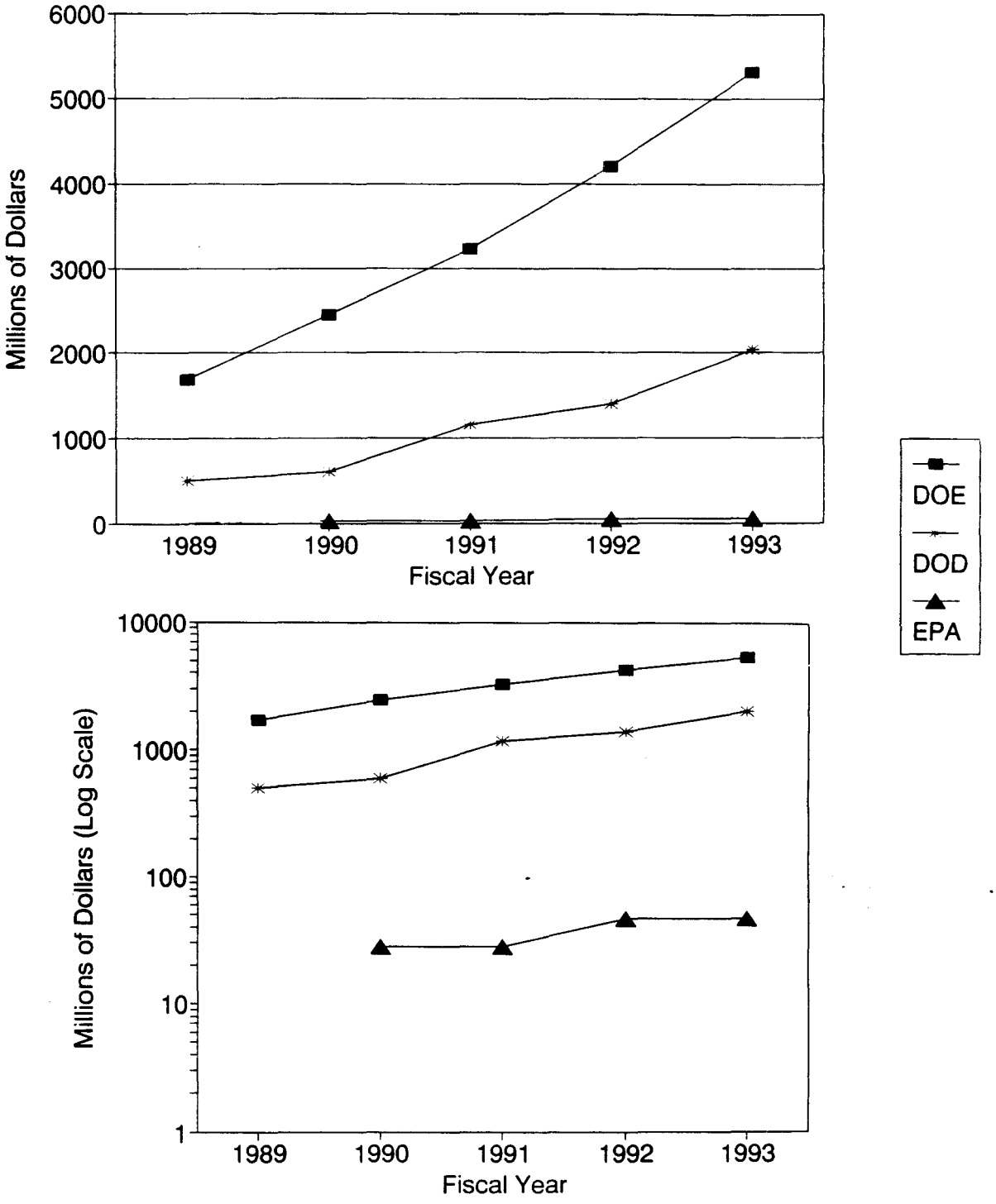
Figure 3.

COMPARISON OF EPA OVERSIGHT FUNDING TO DOE/DOD WASTE CLEANUP BUDGETS FY'89-'93



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of millions of dollars more are needed to oversee other non-DOE/DOD federal facility cleanups such as Bureau of Land Management and Department of Justice prison landfills.

EPA is routinely reimbursed by private parties for the cost of overseeing the cleanup of commercial waste sites. During negotiations over some Interagency Agreements, the Energy Department has agreed to provide oversight funding to EPA and States. Unfortunately, the Office of Management and the Budget (OMB) has opposed the transfer of Energy Department funds to EPA to cover oversight expenses.[66] We believe that OMB's opposition is inconsistent with CERCLA (the "Superfund" law) that allows EPA to recover its costs,[67] especially in light of 1986 amendments which specifically established that these liability provisions apply to government agencies, such as the Department of Energy.[68] Ultimately, it is unimportant whether oversight funds are provided through responsible federal agencies or directly to EPA, as long as necessary oversight funds <u>are provided</u>. While the debate continues about <u>how</u> oversight funding should be provided, EPA and states continue to lack sufficient resources for this vital task.

Opponents of reimbursing EPA oversight costs from DOE and DOD have contended that it is inappropriate to pay one part of the federal government using resources from another. This argument fails to acknowledge numerous examples of the Energy and Defense Department as well as other federal agencies paying EPA for oversight expenses. For example, the U.S. Army has reimbursed EPA for oversight costs at the Twin Cities Ammunition Depot in Minnesota and the Rocky Mountain Arsenal in Colorado. Also, nearly forty Federal Agencies have been

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[66] Grady, Robert E., OMB, "Memorandum Re: Question about reimbursing EPA", to Leo Duffy, DOE, October 17, 1989.

[67] Comprehensive Environmental Response Compensation and Liability Act of 1980, 42 USC 9607(a): "...[T]he owner and operator of a...facility...shall be liable for...all costs of removal or remedial action incurred by the United States Government or a State not inconsistent with the national contingency plan [and] any other necessary costs of response...."

[68] 42 USC 9620: "Each department...of the United States...shall be subject to, and comply with, this Act in the same manner, and to the same extent, both procedurally and substantively, as any nongovernmental entity, <u>including liability under section 107</u>" (emphasis added).

identified as "potentially responsible parties" at scores of non-federal Superfund sites. These agencies may be found liable for cleanup and EPA oversight costs at these sites.

The Administration's opposition to DOE funding of EPA oversight costs is also inconsistent with DOE's transfer to EPA of $700,000 and two full-time equivalents for oversight of DOE hazardous waste requirements at the Waste Isolation Pilot Plant (WIPP)[69]. DOE cannot pay for oversight cost to "grease the skids" of what it considers desirable projects, while refusing to do so for other projects.

Ironically, there are currently even larger transfers from EPA's budget to reimburse DOE for laboratory services at DOE's Grand Junction ($2.6 million) and Oak Ridge ($1.2 million) offices.[70] In addition, the Department of Energy reimbursed the Army Corps of Engineers for "services provided" to review the Energy Department's FY 1993 ERWM budget request.[71]

In light of these precedents for inter-agency reimbursements, the Administration's opposition to DOE payment of EPA oversight expenses appears to reflect more of a value judgment about the importance of oversight in particular cases than a policy judgment about the propriety of such interagency transfers.

It should also be noted that DOE has already provided limited oversight funds to some state agencies as part of interagency or other environmental agreements.[72] At a minimum, DOE

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[69] EPA/DOE, "Interagency Agreement," No. RW89934318-0, signed by Sylvia Lowrance (EPA) and E. Robinson (DOE), November 6, 1989.

[70] DOE, Summary Report on "Superfund Costs Claimed by the Department of Energy Under Interagency Agreements with the Environmental Protection Agency -- Fiscal Year 1988," Letter Report No. CR-L-89-6, September 22, 1989. This report does not necessarily represent the only funds transferred from EPA to DOE.

[71] Grady, Robert E., OMB, Letter to N.P. Dorn, Assistant Secretary for Civil Works, Army, September 26, 1991, p.7.

[72] DOE's FY 1991 Supplemental Budget Request (p. 21) includes approximately $20 million in oversight funding for the states of New Mexico, Missouri, California, Texas, Florida, Idaho, Nevada, Washington and Colorado (average per state = $2.14 million.)

should ensure that sufficient state oversight funding is provided for all sites prior to final approval of comprehensive interagency agreements.

Unfortunately, DOE is inadequately reimbursing states for oversight costs. For FY 1993, DOE has requested only $17.851 million. Many state agencies have been authorized to oversee hazardous waste, air and water pollution regulatory programs. In many states, the DOE facility is the largest single facility requiring environmental oversight (e.g., South Carolina and Washington). Without federal assistance through reimbursement by DOE, state agencies are generally unable to provide adequate oversight of DOE environmental activities. DOE's current mechanism for providing funding through negotiated lump-sum agreements may not be adequately responsive to state reimbursement needs.

5. Full Public Participation Requires Site Advisory Boards

In its landmark report on the nuclear weapons complex, the Congressional Office of Technology Assessment (OTA) recommended that DOE "[d]evelop a structure and process to provide public participation in key cleanup policy and technical decisions".[73] OTA identified two institutional mechanisms that Congress could establish to accomplish this goal:

- advisory boards with technical staff at each site; and
- a national coordinating advisory board.

The Senate Armed Services referred to the OTA report in its FY 1992/93 Defense Authorization Report when it directed DOE to review existing external review groups, "and consider adopting a more uniform, more comprehensive, and more organized system of citizen advisory groups for

[73] OTA, "Complex Cleanup: The Environmental Legacy of Nuclear Weapons Production", OTA-O-484, February 1991, p.10.

environmental restoration and waste management at each of the weapons facilities."[74] Further, the Committee indicated that DOE "should consider a mechanism that would provide any boards with funds sufficient to hire independent technical experts as well as an administrative support person."[75] The Department has not yet released a report on its review.

Since then, the Attorney General of Texas has written to Energy Secretary Watkins urging DOE to fund operations of a "Technical Review Group or Environmental Monitoring Council" and requesting information about the handling of materials from retired warheads at the Pantex Site in Texas.[76] A review group could provide a very useful mechanism for providing timely information to the public and communicating concerns and questions to DOE. For example, the Rocky Flats Environmental Monitoring Council, established in Colorado, has been very helpful in exchanging information among DOE (and its contractors), state agencies, and the public.

DOE has indicated that it intends to establish a national ERWM advisory board. This board could provide the first step toward implementing OTA's recommendations. In addition, Congress should direct DOE to establish site-specific advisory boards, subject to the Federal Advisory Committee Act, and provide adequate funding to enable these boards to perform independent technical analysis.[77]

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[74] U.S. Senate, Committee on Armed Services, "National Defense Authorization Act for FY 1992 and 1993, Report to Accompany S.1507", S.Rep.102-113, July 19, 1991,p.357.

[75] Ibid.

[76] Morales, Dan, A.G., Texas, Letter to Energy Secretary Watkins, March 3, 1992.

[77] Under the 1986 Superfund Amendments, a mechanism for establishing "Technical Advisory Groups" (TAG) was established. The TAG mechanism has been found to be inadequate for large complex DOE facilities because of funding limitations and a complex proposal process.

6. Cleanup Standards for Radioactivity are needed for Effective Cleanups

One of the essential elements of effective and efficient environmental restoration is strong and enforceable cleanup standards. Such standards are critical in determining the degree to which a contaminated site or structure will be remediated (the "how clean is clean" decision) and the ultimate use of the property, i.e. whether it can be returned to unrestricted use or must be fenced off indefinitely.

It comes as a surprise to many that, with the exception of regulations specifically applicable to uranium mill tailings sites[78], there are no federal standards setting an acceptable level of "residual radioactivity" for the cleanup of radioactively contaminated federal or commercial sites, buildings, or equipment. This lack of standards threatens to undermine the efficacy of DOE cleanup programs and EPA or state regulatory decisions. The National Academy of Sciences in its 1989 report on the nuclear weapons complex said that among "the most important" questions in cleaning up DOE sites is how to establish "acceptable levels of cleanup (or, conversely, what level of contamination may remain at a site after cleanup)..."[79] DOE and EPA/state regulators will thus make decisions over the next several years about cleanup remedies and technologies for tens of thousands of sites, structures, and pieces of equipment without the benefit and direction of acceptable standards.

Under Reorganization Plan Number Three creating EPA, President Nixon granted the agency authority pursuant to the Atomic Energy Act (AEA) to establish "generally applicable standards for the protection of the general environment from radioactive materials."[80] Based on

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[78] 40 CFR 192.

[79] The Nuclear Weapons Complex, National Academy Press, 1989, p. 38.

[80] 5 U.S.C., App. I.

this grant of authority, EPA's Office of Radiation Programs has developed or is in the process of developing, for example, standards for off-site exposures from nuclear fuel cycle facilities,[81] for management and disposal of high-level and transuranic waste,[82] and for uranium mill tailings.[83] However, EPA has never placed priority on promulgating residual radioactivity standards and thus they have never been adopted.

Even if they had been adopted, EPA interprets its AEA authority narrowly as allowing it only to promulgate radiation standards but not to implement or enforce them.[84] Thus, in the case of commercial facilities, the authority to apply residual radioactivity standards would, in EPA's view, fall to the NRC and in the case of defense facilities, DOE would have responsibility for implementation. An exception may exist for DOE sites subject to EPA-directed Superfund cleanups where the agency's standards under the AEA, including residual radioactivity limits, would likely be deemed legally "applicable or relevant and appropriate requirements" (ARARs).[85]

OTA, in its report on the cleanup of the nuclear weapons complex, suggested that Congress authorize EPA, NRC, or a new independent national commission to regulate those aspects of radioactive waste management now subject exclusively to DOE authority. According to OTA, this policy initiative could enhance the effectiveness and credibility of those programs by limiting DOE self-regulation and providing independent oversight of the treatment, storage, and disposal of radioactive waste.

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[81] 40 CFR 190.

[82] 40 CFR 191.

[83] 40 CFR 192.

[84] See e.g., EPA 520/4-76-016 at 18-19.

[85] SARA §121(d)(2)(A).

In light of the regulatory vacuum discussed above, Congress should adopt legislation that: (1) codifies EPA authority to set generally applicable radiation standards at both civilian and defense facilities; (2) directs EPA to set standards for residual radioactivity at governmental and commercial sites; (3) sets a schedule for promulgating such standards; (4) provides EPA with clear authority to implement and enforce fully these standards at DOE facilities; and (5) provides EPA with sufficient resources to accomplish these duties.

B. DOE's BUDGET FAILS TO ANTICIPATE TRANSITION ACTIVITIES

1. Congress Should Adopt a Defense Nuclear Workers Bill of Rights for Displaced Workers.

The number of workers employed in the nuclear complex will decline dramatically in the near future, after a decade of relative stability during the 1980s, which followed a decline from a 1964 high of more than 136,000. With the recent announcements of the consolidation of non-nuclear activities and canceled warhead programs, tens of thousands of workers will be laid off. There is a serious need for programs to assist such workers. Just as we are preparing to assist nuclear weapons scientists of the former Soviet Union, we should provide assistance to our own veterans of the Cold War.

Last year we proposed, and Congress adopted, a scholarship and fellowship program to train environmental professional for ERWM tasks. We greatly appreciate the assistance of this Panel, particularly Rep. Lloyd, in supporting that legislation. That program will provide vital assistance in training the next generation of environmental scientists and engineers who will address the contamination problems at DOE facilities.

Congress should expand on that effort to handle the much larger problem of displaced workers. The "Defense Nuclear Workers Bill of Rights Act" (H.R. 3908) introduced by Rep. David Skaggs (D-CO), and cosponsored by, among others, Reps. Bilbray, Bustamante, Evans, Lloyd, and Schroeder, would address some of the problems faced by displaced DOE workers.

Displacement is obviously not exclusive to workers at Energy Department facilities, but unique characteristics distinguish these workers from those laid off from private companies and conventional defense plants. First, workers at nuclear weapons facilities have been subjected to some unusual occupational risks, including radioactive materials, without the same occupational safety and health protection provided to many other workers. Energy Department facilities have long been exempt from oversight by the Occupational Safety and Health Administration and state counterparts and records of workers exposures have not been uniformly maintained or subject to independent oversight. H.R. 3908 would provide reinsurance for workers laid off from nuclear weapons facilities who may face the prospect of health insurance discrimination because of uncertainty about their previous exposures.

Second, H.R. 3908 would address concerns that the standard of proof required by state workers compensation programs may be too strict for most former nuclear workers, whose exposures may not be well documented and whose afflictions may be difficult to link to exposures in a reasonable time period.

In addition, Congress should significantly expand retraining programs for laid off DOE workers. In many cases these workers have been employed at government-owned, contractor-operated, single-use facilities that have little prospect for conversion to commercial activities. DOD contractor employees laid off from a company producing computers or airplanes for defense applications could be rehired after the plant is retooled to produce commercial products. Similarly, laid off auto workers have been rehired after factories are retooled to produce more

marketable cars. In contrast, there is less potential for DOE facilities such as the Rocky Flats Plant, Mound, Pinellas, RMI/Ashtabula or Fernald to make a similar conversion. Many of the workers will require retraining because of the uniqueness of the skills developed in building weapons.

There are a number of reasons for providing retraining and other programs for displaced DOE workers. As a practical matter many of these workers could provide a valuable resource for the growing ERWM programs. They are already familiar with the facilities and have been trained in radiological control procedures. As a political matter, worker retraining programs could reduce motivation to prolong unnecessary DOE programs and government jobs. Perpetuating unneeded projects not only wastes money that could be used for retraining and cleanup, but continued waste generation from unnecessary facilities such as PUREX and the ICPP (discussed above) will require additional management expenditures. Programs such as worker retraining and early retirement could help soften the impact of weapons complex downsizing for both individuals and Congressional districts.

2. Nuclear Materials Reprocessing Activities Should be Halted

Since 1944, the United States has operated a number of nuclear reprocessing facilities to produce an estimated 100 metric tons (MT) of plutonium and 500 MT of highly enriched uranium[86] for defense missions.[87] The F-Canyon at the Savannah River Site (SRS) and the PUREX facility at Hanford primarily produced weapon-grade plutonium. The H-Canyon at SRS

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[86] See Cochran, T.B., and R.S. Norris, "U.S. Nuclear Warhead Production", Ballinger Inc., Cambridge, MA, 1987.

[87] In addition, operation of a reprocessing facility primarily for civilian spent fuel at a site near West Valley, New York, producing 123,000 cubic meters (32 million gallons, 0.3 percent of the HLW by volume, and 2.6 percent of the HLW by curie content).

and the Idaho Chemical Processing Plant at the Idaho National Engineering Laboratory (INEL) primarily produced uranium. The historic justifications for reprocessing, to produce these materials, no longer exist. For a variety of economic and environmental reasons Congress should eliminate all funding for continued reprocessing activities.

a. DOE Has Indicated that Reprocessing is No Longer Necessary.

In its Reconfiguration Study released last year, the Energy Department acknowledged that

> ...plutonium requirements are reduced sufficiently to be satisfied by plutonium from retired warheads alone...it may be possible to produce new pits using only plutonium recovered from pits of retired warheads. Plutonium contained in existing oxides, wastes or residues would not be required and the scale of plutonium operations could be reduced.[88]

Hence, the need for the F-Canyon and PUREX essentially disappeared. More recently, Energy Secretary Watkins indicated in an internal memorandum that

> ... [highly enriched uranium (HEU)] required for the nuclear weapons program can now be made available by means other than reprocessing [and that] the weapons complex of the future will not require the use of reprocessing facilities for HEU recovery.[89]

Consequently, Secretary Watkins directed that "site specific actions and timetables" for the "most practical and prompt phaseout of reprocessing activities" be drawn up.

Congress should not wait for "timetables... for phaseout" to take action. FY 1993 funding for reprocessing activities, including new construction and any operations not necessary to prepare facilities for decontamination and decommissioning, should be eliminated.[90] The proposed

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[88] DOE, Nuclear Weapons Complex Reconfiguration Study, DOE/DP-0083, January 1991, pp. 65 and 160.

[89] Watkins, James D., DOE, "Memorandum to Assistant Secretary for Defense Programs, et al., Subject: Highly Enriched Uranium Task Force Report," February 24, 1992.

[90] DOE has recently formed a new ERWM Office of Transition Activities (EM-60), which is developing guidance and requirements for transferring facilities to ERWM. Deactivated facilities should continue to be funded from the original account until the facility has met these requirements and is ready for decontamination and decommissioning.

budget for the ICPP alone is more than $360 million in FY 1993 for operations and construction, as well as an additional $100 million for waste management costs.[91]

Relatively small quantities of certain isotopes recovered by reprocessing, such as Pu-238,[92] may be required in the future. Pu-238 was last produced in the U.S. in 1984.[93] DOE currently has a stockpile of more than 63 kilograms (139 lbs.) of Pu-238.[94] DOE's FY1993 budget includes more than $80 million for operations of the H-Canyon,[95] primarily for recovery of plutonium-238.[96] The Department has also stated that it is "reviewing the possibility of obtaining additional quantities of plutonium-238 from the Commonwealth of Independent States (former Soviet Union)."[97] Discussion between U.S. and Russian representatives regarding the purchase of Pu-238 for NASA space missions began in 1989. Following technical approval of the quality of the Russian Pu-238, negotiations have proceeded regarding the purchase of 5 kg of Pu-238 for $6 million - far less than the funding required to start up and operate the H-Canyon to produce a similar quantity.[98] We are not necessarily endorsing any particular source of Pu-238. Instead, the need for Pu-238 should first be examined, and if a need exists all reasonable

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[91] Bugger, Brad, DOE/ID, Personal Communication with Beatrice Brailsford, Snake River Alliance, March 26, 1992.

[92] For example, Radioisotope Thermoelectric Generators (RTGs) for space mission energy sources. In addition, small quantities may be need for classified remote terrestrial reconnaissance posts.

[93] Lange, Robert G.,DOE, "Radioisotope Power Systems for the Exploration of Space," presented at the 9th Symposium on Space Nuclear Power Systems, Albuquerque, New Mexico, January 13, 1992, p. 1. The U.S. has launched 37 Pu-238 fueled RTGs into space.

[94] Lange, p. 5; the Pu-238 is stored at Savannah River Site, Los Alamos Laboratory, and Mound.

[95] $70 million is budgeted from Atomic Energy Defense Account/Materials Processing and $14 million from Energy Supply Research and Development.

[96] DOE, FY 1993 Congressional Budget Request, Vol.1, DOE/CR-0006, January 1992, pp. 228-229; Vol.2, 165.

[97] DOE, FY 1993 Budget Request, Vol.1, p. 165.

[98] Rasor, Ned S., Letter to Senator Sam Nunn, March 12, 1992; Broad, William J., New York Times, "Sale of Plutonium by Russia to U.S. Faces Unseen Snag," March 23, 1992, A1.

alternatives for obtaining the material and the resulting environmental impacts, should be considered. Use of the H-canyon at Savannah River for non-defense isotope production should not occur without a complete analysis of environmental impacts and alternatives.

b. Reprocessing Exacerbates Existing Waste Problems.

In a reprocessing plant, fuel rods are dissolved in hot acid, which is then subjected to a series of chemical extractions to isolate selected radioactive materials such as plutonium or uranium. Highly radioactive materials such as cesium-137 and strontium-90 remain in the waste acid, which is then generally stored in underground tanks as a liquid (Hanford, Savannah River) or a calcined solid (INEL). In this process, the volume of the waste increases several thousand-fold from the original fuel to the final liquid and hundreds of times to the final solid calcined waste.

More than 40 years of military reprocessing in the U.S. has produced 399,000 cubic meters (105 million gallons) of high-level waste,[99] and a far larger quantity of low-level liquid radioactive waste.[100] (In contrast to the DOE program, spent commercial nuclear fuel is not reprocessed prior to disposal, but instead is stored in pools or above ground in "dry casks" prior to permanent disposal.) Massive environmental problems have been created by each DOE reprocessing facility. It is not clear whether it is possible, with existing technology, to resolve fully these waste problems. It is clear, however, that we should not be adding unnecessarily to these waste problems while we spend enormous sums of money to try to solve the existing problems. It is

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[99] DOE/OCRWM, "Integrated Data Base for 1991: U.S. Spent Fuel and Radioactive Waste Inventories, Projections, and Characteristics", DOE/RW-0006, Rev. 7, October 1991.

[100] In addition, operation of a reprocessing facility for civilian spent fuel at a site near West Valley, New York from 1966-1972, produced 1,230 cubic meters (325,000 gallons, which comprises 0.3 percent of the HLW by volume, and 2.6 percent of the HLW by curie content.

useful to review briefly each of the major reprocessing facilities in the U.S. to understand the magnitude of the current environmental and financial costs that would be exacerbated by continuing reprocessing.

The twin "Canyon" chemical separations plants at Savannah River -- F and H -- have generated approximately 132,000 cubic meters (35 million gallons) of high-level waste.[101] Operation of the F-and H-Canyon produces approximately 1.16 million and 1.5 million gallons, respectively, of high-level waste per year.[102] In addition, annual operations of F- and H-Canyons generate approximately 460,000 cubic meters (121 billion gallons) per year of liquid low-level radioactive wastes, including contaminated cooling water and storm water runoff.[103] To handle the high level waste stored in tanks, DOE has constructed a waste vitrification facility costing approximately $1 billion.[104] Discharges from the canyons into "Seepage Basins" have resulted in widespread groundwater contamination.[105]

The Idaho Chemical Processing Plant (ICPP) at DOE's Idaho National Engineering Laboratory has produced 12,000 cubic meters (3 million gallons) of high-level waste.[106] In addition, the ICPP pumped almost 7 billion gallons of radioactive waste into an onsite underground well averaging nearly a million gallons a day between 1953 and 1974.[107] The

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[101] U.S. Department of Energy, Integrated Data Base for 1991: U.S. Spent Fuel and Radioactive Waste Inventories, Projections, and Characteristics, DOE/RW-0006, Rev. 7, October 1991, p. 44.

[102] DOE, "Environmental Survey Preliminary Report, DOE/EH/OEV-10-P, August 1987, pp. 4-24.

[103] U.S. DOE, "FEIS: Continued Operation of K-, L-, and P-Reactors, Savannah River Site," (December, 1990), DOE/EIS-0147, p. 4-39.

[104] Known as the "Defense Waste Processing Facility."

[105] DOE, "Environmental Survey Preliminary Report, Savannah River Plant", DOE/EH/OEV-10-P, August 1987, p.4-23.

[106] Integrated Data Base, p. 43. High level waste at the ICPP is reduced in volume by approximately 6 times by "calcining" before interim storage in bins.

[107] Energy Research and Development Administration, "Waste Management Operations, Idaho National Engineering Laboratory", September 1977, ERDA-1536, September 1977, p. II-89.

expansion of ICPP, currently under way, would nearly double the plant's waste output to as much as two million gallons per day.[108]

The costs for handling ICPP waste are significant and increasing. Construction costs for "temporary" long-term storage bins for calcined waste at ICPP have increased substantially. In the early 1980s DOE constructed the sixth set of storage bins for calcined wastes for approximately $14 million. By 1989, DOE estimated the cost for the eighth set of storage bins at $30 million.[109] DOE's FY 1993 Budget Request includes approximately $100 million for waste management operations at the ICPP.

Reprocessing at the Hanford Reservation, primarily at the PUREX plant, has produced approximately 253,600 cubic meters (67 million gallons) of high-level wastes.[110] PUREX generates 3 cubic meters (800 gallons) of high-level waste per MT of fuel processed.[111] Dozens of the high-level waste tanks have been found to be leaking. In addition, safety concerns have arisen about the potential for an explosion in at least one of the tanks. The construction cost for building a vitrification plant, similar to the SRS plant, to solidify the high level waste stored in underground tanks cleanup is expected to cost more than one billion dollars. Discharges from PUREX to percolation "cribs" have caused widespread groundwater contamination in the 200-East Area extending to the Columbia River. The ground water cleanup cost has not been accurately estimated.

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[108] DOE, "Environmental Assessment: Fuel Processing Restoration at the Idaho National Engineering Laboratory", DOE/EA-0306, August 1987, p. 2-14.

[109] DOE/Idaho Operations Office, "Institutional Plan: FY 1986-FY 1991", November 1985, p. 15.

[110] Integrated Data Base, p. 53.

[111] U.S. Department of Energy, DEIS: Process Facility Modifications Project, DOE/EIS-011D, April 1986, 3.23.

Finally, cleaning up the relative small amount of reprocessing waste generated at West Valley Site is expected to cost nearly $900 million dollars.[112]

Perhaps more than any other activity in the nuclear weapons complex, reprocessing has been responsible for much of the massive environmental contamination that distinguishes the defense nuclear enterprise from U.S. civilian nuclear operations. To avoid exacerbating these environmental problems, as well as to exercise normal fiscal prudence, Congress should eliminate funding for continued reprocessing activities except those necessary to maintain the facilities and prepare them for decontamination and decommissioning.

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[112] U.S. Department of Energy, Environment, Safety and Health Needs of The U.S. Department of Energy, DOE/EH-0079, December 1988, v. 2, p. 229.

Attachment A: The Elusive Promised Waste Management Data

Effective waste management operations require, at a minimum, understanding what portion of the budget is directed to managing newly generated waste versus existing stored waste. This data is essential for source reduction planning, but has been unobtainable despite regular requests over the past two years.

NRDC first raised the concern about the use of waste management funds in November 1989.[113] In early 1990, NRDC again raised this concern during a private meeting with ERWM Director Leo Duffy, who indicated that very little waste management resources were spent on newly generated waste and promised to provide a quantitative breakdown.

Throughout 1990, NRDC was repeatedly assured during meetings, hearings, press events, and telephone conversations that the data would be sent in the mail within days or weeks. At the May 1991 Five-year Plan Stakeholders Forum in Virginia, Mr. Duffy reiterated this pledge to an audience of Federal, State and Indian Tribe officials, and environmental organizations. While leaving the meeting an NRDC staffer reminded Mr. Duffy that the data had been previously promised and was assured that there was no problem sending the data "right over." Mr. Duffy then directed that the request be fulfilled by a member of his staff, who was standing nearby, who indicated privately that no such data existed. At the Washington, DC hearing regarding the scope of the ERWM Programmatic Environmental Impact Statement, Mr. Duffy again promised, on the record, to have that information delivered within a week. We have still not received that information.

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[113] Werner, J.D. and D.W. Reicher, Testimony Before the Senate Governmental Affairs Committee, November 14, 1989.

When a DOE contractor contacted NRDC in late 1991 to request comments on the scope of the Department's new Waste Management "Allocation System," we again indicated the need to better understand where DOE is spending its waste management funds before a technically-sound system could be developed.[114] After being assured in meetings with DOE that the data would be forthcoming, we waited for months in vain. Hence, we were surprised when DOE included in its Five-year Plan Briefing charts, without any supporting analysis, a Table asserting that spending for "Current Production, DP Waste" comprised 26 percent of the total Waste Management "Validated Target Level" planning estimate in the Five-year Plan. After several attempts to obtain the supporting analysis for this estimate, we submitted a Freedom of Information Act request on October 25, 1991 to obtain the long-sought data. We have not yet received a reply.

[114] Werner, J.D., NRDC, Letters to John Shideler, JK Associates, and Kevin Donovan, DOE, August 29, 1991 and January 6, 1992, respectively.

Attachment B

WASTES PRODUCED BY THE ICPP

Given:				
UO2 sp. gr. =			10.96	
kg UO2 =	91.24	cc =		0.09 L/kg UO2

HIGH LEVEL WASTE: Ratio of waste volume from each kg U-235 processed

Case I. Existing CPP-601
(based on Phillips Petr. Co. operating records for 1963)

132.20	gallons HLW/kg U-235 processed
500.38	L HLW/kg U-235 processed
5,484.13	L HLW/L U-235 processed

Case II. Proposed Fuel Processing Facility (under construction)
(based on Environmental Assessment, DOE/EA-0306, p. 4-39)

380	gallons HLW/kg U-235 processed
1,438	L HLW/kg U-235 processed
15,764	L HLW/L U-235 processed

LOW LEVEL WASTE: Ratio of waste volume from each kg U-235 processed

22,762	kg U-235 processed (1953-1984)
2	kg U-235 processed/day
6.89	billion gallons of LLW discharged (1953-1974)
857,445	gallons/day LLW discharged
426,528	gallons LLW/kg U-235 processed
1,614,409	L LLW/kg U-235 processed
17,693,928	L LLW/L U-235 processed

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Attachment C[115]

LEGALLY REQUIRED ADS ACTIVITIES THAT WILL NOT BE MET AT THE PPL FUNDING LEVEL

DOE FIELD OFFICE, ALBUQUERQUE

Los Alamos National Laboratory:

o ADS: ALLA-1071, ALLA-1078, ALLA-1079, ALLA-1082, ALLA-1085, ALLA-1100, ALLA-1106, ALLA-1122, ALLA-1129, ALLA-1147, ALLA-1148, ALLA-2107.

Delays waste cleanup assessments required under RCRA permit. Renegotiation of permit cleanup milestones will be required.

Mound Plant:

o ADS: ALMD-1182, ALMD-1183.

Delays waste cleanup assessments required under RCRA permit. Renegotiation of permit cleanup milestones will be required.

Pinellas Plant:

o ADS: ALPP-1066.

Potential delay in waste cleanup assessment required under RCRA permit. Possibly requiring renegotiation of cleanup milestone.

FERNALD OFFICE (FERNALD ENVIRONMENTAL MANAGEMENT PROJECT)

o ADS: FS-46-82. Response Action - Operable Unit 1
ADS: FS-47-82. Response Action - Operable Unit 2

Delays waste cleanup actions required under CERCLA Section 120 Federal Facility Agreement. Renegotiation of milestones needed.

DOE FIELD OFFICE, IDAHO

o ADS: ID-102-E4. Active Underground Storage Tanks

Delays replacement of 34 UST's. Regulatory vulnerability.

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[115] Duffy, Leo P., Memorandum to the Secretary, through the Under Secretary, "Re: ACTION: Appeal of FY 1993 Internal Review Budget (IRB) Allocation for the [ERWM] Program," September 4, 1991.

DOE FIELD OFFICE, OAK RIDGE

- ADS: OR-445-EW. Analytical Support Services

  Delay in construction of laboratory to support restoration effort will require renegotiation of CERCLA Federal Facility Agreement cleanup milestones if additional analytical capability is not obtained.

DOE FIELD OFFICE, RICHLAND

- ADS: RL-4000-OV. Waste Vitrification Plant Treatment

  Delays TPA milestone two years (from 12/99 to 12/2001). Renegotiation of milestone will be required.

- ADS: RL-424-KE. Outdoor Storage of Waste Equipment

  Non-legal requirement; however, this involves delay of correction of a Tiger Team finding for the disposal of waste equipment.

DOE FIELD OFFICE, SAVANNAH RIVER

- ADS: SR-2-LA, SR-5-AA, SR-5-AB, SR-3-AA, SR-35-AA, SR-44-AA

  Delays in several DWPF-related activities will result in delay of DWPF operations, violating RCRA Federal Facilities Compliance Agreement. Renegotiation of milestones will be required.

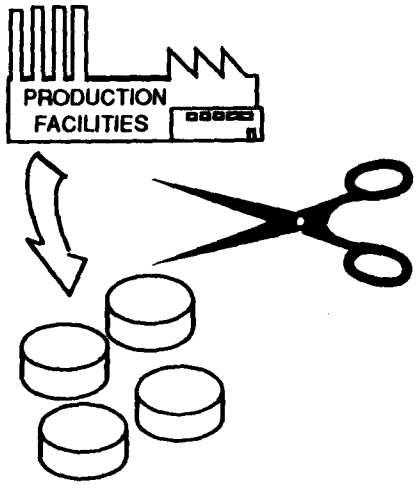
- ADS: SR-69-LA, SR-70-AA TRU and Mixed Waste Facilities

  Delays design activities of TRU facility in violation of RCRA Federal Facility Compliance Agreement. Delays various activities at Mixed Waste Facility in violation of FFCA. Renegotiation of milestones will be required.

- ADS: SR-641-AC. M-Area Waste Disposal

  Delays start of construction within 90 days of RCRA permit issuance, in violation of RCRA Federal Facilities Compliance Agreement requirements.

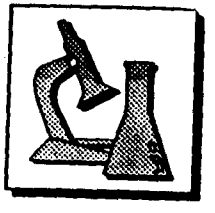
CUT UNNECESSARY AND NON-ENVIRONMENTAL PROJECTS FROM DOE'S WASTE MANAGEMENT BUDGET...



- PUREX ($200 million)
- ICPP ($100 million+)
- FFTF ($45 million)
- Reprocessing Research ($3.2 million+)

...TO INCREASE FUNDING FOR:

- *ENVIRONMENTAL RESTORATION,*
- *TECHNOLOGY DEVELOPMENT &*
- *STATE/EPA OVERSIGHT.*



EPA

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