

United States General Accounting Office

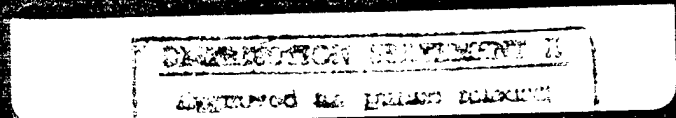
GAO

Report to the Subcommittee on National
Security, International Affairs, and
Criminal Justice, Committee on
Government Reform and Oversight,
House of Representatives

March 1997

ENVIRONMENTAL CLEANUP AT DOD

Better Cost-Sharing Guidance Needed at Government-Owned, Contractor-Operated Sites



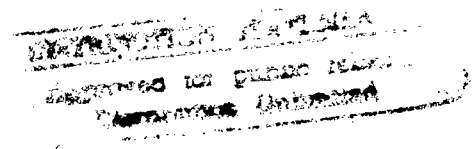
19970502 229

National Security and
International Affairs Division

B-272542

March 27, 1997

The Honorable J. Dennis Hastert
Chairman
The Honorable Thomas M. Barrett
Ranking Minority Member
Subcommittee on National Security,
International Affairs, and Criminal Justice
Committee on Government Reform and Oversight
House of Representatives



This report responds to your subcommittee's request that we examine Department of Defense (DOD) policies and practices regarding cleanup of environmental contamination at government-owned, contractor-operated (GOCO) plants, as a follow up to our previous reports that showed inconsistent policies and practices on cost sharing. We reviewed nine higher-cost case studies at the Defense Logistics Agency (DLA) and the military services (1) to assess the consistency of cost-sharing practices across DOD and (2) to compare the service cleanup estimates against DOD's. Specifically, we identified the actions taken and the types of arrangements for sharing cleanup costs between the government and other responsible parties, and examined site-specific cleanup cost data.

Background

Since 1992, we have reported that the government could pay hundreds of millions of dollars to and on behalf of DOD contractors for cleanup resulting from their operations. In October 1992, we reported that DOD reimburses contractors for cleanup expenses at their private property in different ways, with wide variances in reimbursement decisions and in investigations into possible wrongdoing by contractors.¹ In July 1994, we reported that DOD had also incurred cleanup expenses in cases where contractors and other private parties were involved in contamination of government property.² DOD had inconsistent policies and practices for recovering costs from other responsible parties. In both reports, we recommended that the Secretary of Defense provide guidance to resolve the disparities.

DTIC QUALITY INSPECTED 4

¹Environmental Cleanup: Observations on Consistency of Reimbursements to DOD Contractors (GAO/NSIAD-93-77, Oct. 22, 1992).

²Environmental Cleanup: Inconsistent Sharing Arrangements May Increase Defense Costs (GAO/NSIAD-94-231, July 7, 1994).

One of the principal laws governing responsibility for hazardous waste cleanup at federal facilities is the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended (42 U.S.C. 9601). This act, commonly known as Superfund, holds owners, operators, and other responsible parties, including federal agencies, liable for cleanup of past contamination. Cleanup at federal facilities is also subject to the legal requirements of the Resource Conservation and Recovery Act of 1976, as amended (42 U.S.C. 6901), and applicable state laws.

DOD's Defense Environmental Restoration Program addresses identification, investigation, and cleanup of past contamination on DOD installations. Funding for the cleanup has come primarily through the Defense Environmental Restoration Account (DERA).³ The individual services and DLA are responsible for cleaning up their respective installations, while the Army Corps of Engineers is responsible for cleaning up formerly used DOD sites.

Results in Brief

The services' policies and practices for having contractors share cleanup costs still vary widely. Notwithstanding our recommendations to do so, DOD has not given the services adequate guidance for making decisions on whether and when to seek recovery of environmental cleanup costs incurred by DOD from contractors and other parties at GOCO facilities. The Army authorized indemnifying⁴ its operating contractors from cleanup costs at ammunition plants; the Navy policy requires cost-recovery efforts, but has not initiated timely requests for cost sharing or followed up; and the Air Force is beginning to seek participation in cleanup costs from its operating contractors.

Regarding cleanup at GOCO facilities we visited, DOD's fiscal year 1994 report to Congress included cleanup costs that were closer to the military services' supporting data than DOD's reported fiscal year 1993 estimates. DOD's estimates for cleaning up the 78 GOCO facilities increased from \$1.4 billion in fiscal year 1993 to \$3.6 billion in 1994, but decreased

³Most cleanup actions are funded through DERA and the Base Realignment and Closure Account. Congress established DERA in 1984 to fund the cleanup of inactive contamination sites on DOD installations. Through fiscal year 1995, DOD reports that about \$10 billion has been invested from DERA and \$2.6 billion from the Base Realignment and Closure Account for closing installations.

⁴Under Public Law 85-804, the National Defense Contracts Act of 1958, as implemented by Executive Order 10789 and the Federal Acquisition Regulation, three major types of actions may be taken: advance payments; contract adjustments; and any other actions under authority of the act, referred to as residual powers. A frequently reported action under residual powers is indemnification of contractors against losses from unusually hazardous or nuclear risks that are not otherwise insured.

somewhat to \$3.3 billion in 1995.⁵ Although DOD and the services have addressed our recommendations to improve cost information, their estimates of past and projected costs still differ, and not all costs were included. For example, the 1995 estimate decreased in part because DOD excluded \$19.1 million in unfunded Navy cleanup requirements that should have been reported, and DLA cleanup costs totaling \$101 million in fiscal year 1994 that would be funded by customer surcharges. Also, we found many additional expenses that were not included in either DOD or service cost estimates.

Because Superfund holds parties liable for the billions of dollars needed to remediate past contamination regardless of wrongdoing, it is important that DLA and the services deal with potentially responsible parties on the basis of consistent policy and accurate data. However, the lack of DOD guidance on cost sharing has permitted inconsistencies in approaches to cost sharing, and the potential for some parties to be held responsible for cleanup costs, while others in similar situations are not. If cost-sharing agreements are reached, omissions in historical information and cost data may inhibit the recovery of all appropriate costs.

Inconsistent Treatment Remains Despite Some Service Progress in Developing Cost-Sharing Guidance

In the absence of sufficient DOD guidance, the services have taken different approaches in asking parties associated with GOCOS to share the cost of cleaning up contaminated sites and wide disparities still remain. Since our 1992 report, the Air Force has issued guidance for dealing with other responsible parties at its facilities. The Air Force, the Navy, and the Army Corps of Engineers have policies or guidance in place to encourage cost sharing with contractor operators and other responsible parties, while the Army itself and DLA generally do not. Except for the Navy, each service has obtained some cost sharing at GOCO facilities with other responsible parties. However, only the Air Force and the Army Corps of Engineers have achieved cost sharing with contractors that operated government-owned facilities.

Army Policies and Practices

The Army has no servicewide policy regarding cleanup cost sharing. However, in a series of actions, the Secretary of the Army approved indemnification of ammunition plant operators from financial liability for environmental cleanup. Army officials state that there has been no actual payment to operators under indemnification because the Army pays for

⁵Cost taken from the Defense Environmental Cleanup Program, Annual Report to Congress, dated March 31, 1994, for fiscal year 1993 and the Defense Environmental Restoration Program, Annual Report to Congress, dated March 31, 1995, for fiscal year 1994 and May 15, 1996, for fiscal year 1995.

the cleanups directly out of its own funds. In fiscal year 1994, Army ammunition plants accounted for \$3.1 billion (86 percent) of the \$3.6 billion in past and future cleanup costs reported by DOD.

Pursuant to the Secretary's approval, the Army authorized the inclusion of Public Law 85-804 indemnification clauses in its contracts with ammunition plant operators. These clauses indemnified the contractors against unusually hazardous risks, including environmental releases. According to Army officials, contingency clauses in the contracts also protect ammunition plant operators against environmental liability.

The Army has not negotiated any cost-sharing agreements with contractor operators at the ammunition plants. However, the Army negotiated a cost-sharing settlement with a contractor who produced ammunition for the Army as a tenant at one plant we visited. Also, as discussed in our July 1994 report, the Army Corps of Engineers negotiated a cost-sharing settlement with contractors and other private parties at formerly used defense sites.

Navy Policies and Practices

Since 1989, Navy policy has required major command officials to immediately negotiate cost-sharing arrangements with contractors as soon as the need for cleanup is identified. The policy requires that past and current GOCO contractors pay "any and all" cleanup costs associated with their operation of Navy facilities. However, the Navy has not initiated timely requests for cost sharing or followed up.

For example, although Navy's 1989 policy required officials to begin negotiation on cost-sharing arrangements at the two facilities we visited, the Navy has not initiated timely requests for contractor participation in the cleanup. The Navy did not send a letter requesting contractor participation in cleanup at the Allegany Ballistics Laboratory in West Virginia until 1994, and has not begun as of March 6, 1997, the required negotiations with the contractor at the Naval Industrial Reserve Ordnance Plant in Fridley, Minnesota. Neither operator plans to pay any cleanup costs involving Navy property.

Under the facilities-use contracts at these locations, GOCO contractors provide goods and services to the Navy, and the service does not directly manage their operations. Navy documents show that operational decisions, including those involving waste disposal, are made by the contractor.

To date, the Navy has taken responsibility for cleanup costs. Navy officials said the Navy intends to clean up the facilities first and then decide whether to pursue contractors to recover a share of the costs. Cost-recovery decisions are to be based on evidence, litigation risk, the contractor's level of responsibility, and other factors. However, Navy officials stated that the Navy is reluctant to pursue GOCO contractors because of concerns they will pass costs back to the government as an allowable expense or through overhead charges. They also said that a divisive liability issue could slow cleanup operations and hurt relations between the Navy and its contractors.

Air Force Policies and Practices

In December 1995, the Air Force General Counsel's office developed guidance that recognizes that past and present contractors, as generators of contaminants and operators at federal facilities, share the liability for environmental contamination. The guidance calls for sharing remediation costs, based on the facts of each situation. In commenting on this guidance, Air Force officials stated that the Air Force approved a practice similar to the Navy policy for cost sharing. Air Force officials stated that the practice is intended to share cleanup costs equally with operators unless conditions warrant otherwise.

At the two locations we visited, the Air Force was paying all cleanup costs, but may later pursue other parties. However, at two other locations, the Air Force had agreed with the facility operators to share costs. According to Air Force officials, the settlement agreement prohibits the contractors from charging their environmental cleanup costs back to a government contract. Air Force officials also stated that the absence of federal guidance governing how to treat environmental cleanup costs, together with inconsistent treatments and allowances throughout DOD, have slowed cost-sharing negotiations with contractors.

DLA Policies and Practices

DLA's policy requires current operating contractors to pay cleanup costs in cases of wrongdoing, but allows fuel customers to pay for past contamination through a surcharge.⁶ However, DLA does not have a specific policy for its fuel supply centers to address those cases in which parties other than contractors, such as lessees or tenants, are responsible for contamination. DLA has considered developing such cost-sharing guidance, but had not done so as of March 1997.

⁶To recover most cleanup costs for past contamination, DLA assesses a 1-cent per barrel surcharge to its customers.

The Norwalk center we visited has been negotiating for the recovery of costs. Officials are negotiating with a lessee to pay for most of the facility's cleanup costs. However, the facility did not gather sufficient evidence to determine whether to seek recovery from another party for \$10 million in environmental damage at an off-post location.

DOD-Wide Policy Issues

Even though we recommended in 1992 and again in 1994 that DOD issue guidance to resolve disparities between DLA's and the military services' cleanup policies and procedures, DOD has not done so. In a letter dated January 9, 1995, responding to our 1994 report, the Deputy Under Secretary of Defense (Environmental Security) stated that DOD's policy for cost sharing is to comply with the Federal Acquisition Regulation, which provides for the allowability of costs incurred by government contractors. However, the regulation only applies to costs incurred by contractors. It does not prescribe an approach for seeking contractor contributions to DOD cleanup efforts.

The policies and practices for seeking contractor participation in cleanup efforts continue to vary widely among the services and DLA. Some variances, such as DLA's policy to pay for old contamination (not from current operations) through a surcharge to customers, may be justified where no specific evidence identifies the responsible party or when other case-specific factors, such as frequent changes in contractors, may preclude assigning responsibility. However, we continue to believe that uniform guidance from DOD would help resolve disparities among DLA and service cleanup policies and practices.

Cleanup Estimates Improving, but Problems Remain

Following our July 1994 report that cleanup at GOCO plants would take longer and cost far more than DOD's estimate, DOD increased its fiscal year 1993 estimate of \$1.4 billion to \$3.6 billion in fiscal year 1994. For example, in fiscal year 1993, DOD estimated the Twin Cities Army Ammunition Plant would be cleaned up by the year 2000 at a total cost of \$154 million, which was not consistent with supporting data showing costs of about \$600 million through 2052. DOD's fiscal year 1994 report was more consistent with supporting data, showing estimated completion by 2080 at a total cost of about \$773.2 million.

Although DOD's report to Congress and service estimates for our case studies were relatively close in total, table 1 shows significant differences for individual locations for fiscal year 1994. Some of the reasons for these

cost differences include different estimating methodologies, an input error, and the inclusion of more accurate future cost estimates.

Table 1: DOD's and the Services' Estimated Total Cleanup Costs for Nine GOCOs

Dollars in millions

Facility	DOD report	Component estimate	Estimate difference	Percentage of estimate difference
Army				
Twin Cities plant	\$773.2	\$810.9	(\$37.7)	(4.9)
Lake City plant ^a	339.2	168.1	171.1	50.4
Newport plant	55.5	41.5	14.0	25.2
Navy				
Allegany	30.7	27.8	2.9	9.4
Fridley	37.9	30.7	7.2	19.0
Air Force				
Plant 4	63.0	79.6	(16.6)	(26.3)
Plant 44	61.3	90.9	(29.6)	(48.3)
DLA				
Norwalk	16.5	16.5	0	0
Ozol	6.4	6.4	0	0
Total	\$1,383.7	\$1,272.4	\$111.3	8

^aDOD cleanup estimates decreased at Lake City Ammunition Plant from \$339.2 million in fiscal year 1994 to \$139.4 million in fiscal year 1995.

Source: Service officials and the Defense Environmental Restoration Program Annual Report to Congress (Mar. 31, 1995) for fiscal year 1994.

In addition, cleanup expenses not identified in either DOD or service component estimates included:

- \$120 million to decontaminate and dispose of the chemical plant at the Newport Army Ammunition Plant;
- \$6 million in cleanup costs for uranium-tipped bullets at the Lake City Army Ammunition Plant;
- \$4 million in 1983 and 1984, which was paid for cleanup costs at Air Force Plant 4 before DERA funds were available;
- \$836,000 already spent on a cleanup study at the Navy's Allegany Ballistics Laboratory; and
- money paid to the Environmental Protection Agency (EPA) and state regulatory agencies for overseeing the cleanup at several sites (as an

example, at the Fridley Naval Industrial Reserve Ordnance Plant, \$481,000 was paid to EPA and \$106,000 was paid to the state of Minnesota).

DOD's report for fiscal year 1995, dated May 15, 1996, showed that total cleanup cost estimates for GOCO facilities decreased from \$3.6 billion to \$3.3 billion, but it did not include cleanup costs for our 2 DLA case studies, or with 1 exception, any of the 21 DLA facilities reflected in prior DOD reports. According to DOD officials, these facilities were excluded from the latest report because customer surcharges rather than DERA funds paid for cleanup costs. DLA cleanup costs totaled \$101 million in DOD's fiscal year 1994 report.

We recognize that cleanup estimates for facilities will be preliminary until DOD fully characterizes contaminants, selects a remedy, and finances the remedy. However, most of the cost differences noted in our case studies can be accounted for given the stage of cleanup in each case.

Furthermore, excluding environmental cleanup costs from DOD's restoration program report because the funding source is other than DERA can be misleading. For example, the DLA cleanups excluded from DOD's report for fiscal year 1995 are, except for funding source, similar to cleanups still reported for the military services. Also, DOD's report still includes cost for cleanups totaling \$624 million in 1995 that were funded by its base realignment and closure account rather than DERA. Finally, the services' stated plans to later obtain cost sharing from other responsible parties require that complete cost data be readily available.

Recommendations

To address the inconsistencies in cost-sharing approaches and the potential for disparate treatment of other responsible parties described in this and past reports, we recommend that the Secretary of Defense issue guidance to DOD components to resolve current disparities and to promote future consistent treatment of all parties in cost recovery decisions.

So that sufficient data will be available for cost-sharing negotiations and program oversight, we also recommend that the Secretary direct the military services and DLA to:

- Identify, to the extent it has not already been done, whether parties other than the government were involved with any contamination, as part of environmental cleanup preliminary assessments at GOCO facilities.

- Obtain all relevant data regarding other responsible parties identified, whether or not wrongdoing is an issue.
- Gather and maintain the most timely and accurate DOD cost data available in DLA, military service, and other agencies' records.
- Provide consistent estimates, including all cleanup costs for DOD's environmental reports to Congress, regardless of the source of funds.

Agency Comments and Our Evaluation

In commenting on a draft of this report, DOD stated that it was generally complying with all five of our recommendations under existing practices. However, as we detailed below, DOD has not fully addressed the issues and specific cases discussed in this report and we continue to believe that DOD needs to take additional actions on each of our recommendations.

Regarding the need for DOD guidance on the recovery of cleanup costs, DOD stated that its policy is to comply with the Federal Acquisition Regulation and that the Defense Contract Audit Agency issued audit guidance for field auditors in 1992 on how to interpret the regulation. However, as we stated in this and prior reports, federal acquisition laws, regulations, and policies do not provide specific guidance to decision-makers on how to treat environmental cleanup costs. In the absence of guidance that explicitly addresses the sharing of DOD cleanup costs, the services and DLA have taken different approaches to deciding whether and when to seek contributions from contractors and other responsible parties. We continue to believe that a DOD-wide policy is needed to address these disparities and promote consistent treatment of all parties in the recovery of DOD-incurred cleanup costs.

DOD stated that it is already identifying parties involved with contamination and obtaining all relevant data for other responsible parties, in line with our second and third recommendations. However, our case studies indicate that searches for potentially responsible parties were not done and services had not obtained all relevant information. DOD's comments did not identify what actions it had taken to resolve such cases or the Air Force concerns about the lack of DOD guidance. Thus, we continue to believe that more should be done in this area.

DOD indicated that it did not believe it should gather costs incurred by all non-DOD organizations. We agree and modified our recommendation to focus primarily on DOD costs. Nevertheless, if another federal agency has pertinent information on added DOD cleanup costs, as we found in each

case study, efforts should be made to gather and maintain that information.

DOD stated that its report to Congress is not intended to represent all expenses associated with other funding sources, with the exception of the Base Closure and Realignment Account. DOD also stated that there is no value added to reconstructing past non-DEIRA expenses. We agree that it may not be worthwhile to reconstruct minor costs incurred prior to availability of DEIRA funds. However, excluding all cleanup expenses of an entire agency such as DLA simply because the money to pay those expenses came from a different federal account results in reports that materially understate federal expenses for cleanup costs. It may also lead to omissions by the military service where they funded cleanups from business operating funds. The use of business operating funds for cleanup is already prevalent in the Navy. Finally, complete cost data is necessary for the military services' stated plans to obtain cost sharing from other responsible parties. DOD's comments are reprinted in their entirety in appendix V.

Matter for Congressional Consideration

The high cleanup costs, coupled with inconsistent policies and practices for recovering costs from other parties, can lead to adverse budget consequences. Because DOD's comments indicate that it does not plan to take any actions to address the problems set forth in this report, Congress may wish to call upon the Secretary of Defense to issue guidance to address inconsistencies in cost-sharing approaches and to promote future consistent treatment of all parties in cost recovery decisions.

Scope and Methodology

We conducted our work at the Washington, D.C., area headquarters offices of DOD, DLA, and the military services and at selected commands and field installations. The Washington, D.C., area commands included the Naval Air Systems Command, Naval Sea Systems Command, and the Defense Fuel Supply Center. We also visited the Army Environmental Center in Aberdeen, Maryland; the Air Force Acquisition Environmental Management Directorate in Dayton, Ohio; and the Naval Facilities Engineering Command Southern Division in Charleston, South Carolina.

At headquarters, command, and field locations, we interviewed DOD, contractor, state agency, and EPA officials. To assess consistency of cost-sharing practices, we compared headquarters policies and field practices at case study locations identified below. To examine cleanup

cost estimates, we obtained data on DOD environmental cleanup program status and costs, noted differences among organizations, and examined supporting documents, but did not independently determine actual costs.

We used a case study methodology at selected field facilities. We visited nine GOCO facilities to determine the status and cost of cleanup, and the extent of cost sharing for environmental cleanup at the facilities. We selected facilities with larger total cleanup costs, managed by each of the military departments and DLA. We determined whether site specific data identified all known costs and compared the data to military service records and DOD reports. We reviewed cost-sharing practices across the locations visited, but did not independently evaluate liability issues or the merits of cost-sharing decisions in individual cases.

Army

- Lake City Army Ammunition Plant, Missouri
- Newport Army Ammunition Plant, Indiana
- Twin Cities Army Ammunition Plant, Minnesota

Air Force

- Air Force Plant 4, Fort Worth, Texas
- Air Force Plant 44, Tucson, Arizona

Navy

- Allegany Ballistics Laboratory, West Virginia
- Naval Industrial Reserve Ordnance Plant, Fridley, Minnesota

DLA

- Defense Fuel Support Point Norwalk, California
- Defense Fuel Support Point Ozol, California

We performed our work from June 1995 through March 1997 in accordance with generally accepted government auditing standards.

Unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days after its issue date. At that time, we will send copies to the appropriate congressional committees; the

Secretaries of Defense, the Army, the Navy, and the Air Force; and the Directors of DLA and the Office of Management and Budget. We will also make copies available to others upon request.

Please contact me on (202) 512-8412 if you or your staff have any questions concerning this report. Major contributors to this report are listed in appendix VI.

Sincerely yours,

A handwritten signature in cursive script that reads "Henry L. Hinton, Jr." with a stylized flourish at the end.

Henry L. Hinton, Jr.
Assistant Comptroller General

Contents

Letter		1
Appendix I		16
Army Case Studies	Agency Cost-Sharing Policy	16
	Twin Cities Army Ammunition Plant	17
	Lake City Army Ammunition Plant	20
	Newport Army Ammunition Plant	22
Appendix II		25
Navy Case Studies	Agency Cost-Sharing Policy	25
	Allegany Ballistics Laboratory	26
	Naval Industrial Reserve Ordnance Plant, Fridley	28
Appendix III		32
Air Force Case Studies	Agency Cost-Sharing Guidance	32
	Air Force Plant 4	33
	Air Force Plant 44	35
Appendix IV		38
Defense Logistics Agency Case Studies	Agency Cost-Sharing Policy	38
	Defense Fuel Support Point, Norwalk	38
	Defense Fuel Support Point, Ozol	40
Appendix V		42
Comments From the Department of Defense		
Appendix VI		45
Major Contributors to This Report		
Table	Table 1: DOD's and the Services' Estimated Total Cleanup Costs for Nine GOCOs	7

Contents

Abbreviations

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DERA	Defense Environmental Restoration Account
DLA	Defense Logistics Agency
DOD	Department of Defense
EPA	Environmental Protection Agency
GOCO	government-owned, contractor-operated

Army Case Studies

We visited three Army ammunition plants—one active plant, two inactive—still owned by the Army. The Lake City Army Ammunition Plant, Independence, Missouri, was active. The Newport Army Ammunition Plant, Newport, Indiana, and the Twin Cities Army Ammunition Plant, Arden Hills, Minnesota, no longer produce ammunition. The Army owns a total of 27 government-owned, contractor-operated (GOCO) plants, of which 24 are ammunition plants. Seven of the 24 are currently active.

Agency Cost-Sharing Policy

The Army has no overall policy for sharing costs with other parties and does not plan to pursue current or past GOCO operators to share environmental cleanup costs at the case study facilities. However, at one plant we visited, the Army negotiated cost-sharing arrangements with contractors who are not considered operators and is seeking reimbursement from the operator's insurance company.¹

According to Army officials, the ammunition plant operators are protected against environmental liability by protective clauses in their contracts, such as the "Responsibility of Contractor - Contingencies" clause, and by an indemnification clause, which was recently added. The Secretary of the Army authorized the indemnification clauses under Public Law 85-804 in a series of memoranda. For the three locations we visited, we found relevant memoranda dated May 1985, November 1990, and November 1992. Army officials stated that the indemnification provision would allow ammunition plant operators to claim recovery of cleanup costs, but that such a claim has not been made because the Army has assumed all cleanup costs at its ammunition plants.

Army officials said that the Army, as the landowner, should be responsible for cleaning up the property. They stated that it would be inappropriate to hold former contractors liable for the cleanup costs because contamination resulted not from bad faith or willful misconduct, but from industrial practices that used to be considered acceptable. Army officials stated that indemnification of ammunition plant contractors was justified by the unusually high risk they encountered in handling explosives and reactive and hazardous materials.

Despite the Army's view, a finding of wrongdoing is not a required condition for cost sharing under the Comprehensive Environmental

¹As noted in our prior reports, the Army Corps of Engineers also negotiated cost-sharing settlements with former operators of formerly used defense sites. In addition, the Army has obtained more than \$300 million from Shell Oil Company as of December 1995 toward shared cleanup costs at the Rocky Mountain Arsenal.

Response, Compensation, and Liability Act (CERCLA). Owners and operators at private facilities have not been relieved of liability on that basis.

Although the Army has not achieved cost sharing by its ammunition plant operators, it has pursued other responsible parties. For example, at the Twin Cities facility, the Army is attempting to recover more than \$10 million from one GOCO operator's insurance company. The Army did negotiate a settlement with a contractor who was a tenant at this facility. This contractor—like the GOCO operator—produced ammunition for the Army for decades, but did so under a “facility contract,” that did not indemnify the tenant. Under an agreement, the tenant contractor must pay all cleanup costs associated with its production and a percentage of the cleanup for areas in which the source of contamination is unclear.

Twin Cities Army Ammunition Plant

The Twin Cities Army Ammunition Plant is an inactive facility that occupies about 2,370 acres in Arden Hills, Minnesota. Established in 1941, the plant produced ammunition intermittently until 1976. Throughout all but the last 1 of the plant's 55 years, the Federal Cartridge Company was its only operating contractor. Alliant Techsystems, a long-standing tenant at the plant, took over as the GOCO operator in November 1995. Alliant, formerly Honeywell, had been a tenant at the Twin Cities plant since the late 1950s, manufacturing small ammunition for the Department of Defense (DOD). Also, the 3M Company, as a lessee, conducted commercial production activities on the facility between 1950 and 1993.

The production activities at the Twin Cities facility generated hazardous waste that contaminated the soil, structures, and groundwater, including the drinking water for the facility and the city of New Brighton, Minnesota. Soil was contaminated with explosives, metals, polychlorinated biphenyls, and volatile organic compounds. Plant property occupied by the lessee was contaminated by low-level radioactivity. Groundwater was contaminated with trichloroethylene and had migrated off the site.

The Twin Cities plant was placed on the Environmental Protection Agency's (EPA) National Priorities List in 1983 as part of the New Brighton/Arden Hills Superfund site, an approximately 36-square-mile site encompassing the plant and the contaminated groundwater. The Superfund site was divided into three main units. Two of the units contain distinct plumes of contaminated groundwater, known respectively as the

north plume and the south plume. The third unit consists of contaminated soils and groundwater within the plant's boundary.

Production waste from the plant also contaminated three privately owned disposal sites to which the operator sent the waste. According to a contractor official, the company had complied with the standards of the time.

Also, between 1959 and 1962, over 1,400 drums of waste from classified munitions and, in 1945, 500 tons of 50-caliber bullets were disposed of in Lake Superior. Records about the classified waste are not available, but Army officials said that the waste had been packed into 55-gallon drums, transported over land under Army escort to Duluth, Minnesota, and dumped into the lake from barges. The state pollution agency and Corps of Engineers had not yet decided whether an investigation by the Army of the 50-caliber bullet disposal was necessary at the time of our review.

Cleanup Efforts

Investigations at the Twin Cities plant began after the 1981 discovery of contamination in the drinking water supply. Six interim remedial actions and three removal actions have been completed at the facility. As of December 1996, the final remedy to pump and treat groundwater from the south plume is in place, and the final remedy for the north plume has been implemented. The remedy for cleaning up contamination within the boundary of the facility has been proposed and is under evaluation.

Cleanup Cost Estimates

DOD and Army cleanup cost estimates for fiscal year 1994 (\$773.2 million and \$810.9 million, respectively) were much closer than in 1993 (\$154 million according to DOD, versus about \$600 million according to installation data). DOD's May 15, 1996, report for fiscal year 1995 increased the total past and future cleanup cost estimate to \$828.2 million.

Neither DOD's report nor the Army's estimate included all known cleanup costs for the Twin Cities plant, with at least an additional \$8.2 million of expenditures.

Examples where either Defense Environmental Restoration Account (DERA) funds were not designated as being used for cleanup at the Twin Cities plant or where non-DERA funds were used for cleanup at the Twin Cities plant, but not reported, include:

- more than \$560,000 paid to regulators, including \$125,000 for EPA investigations at the Lake Superior disposal site, and about \$435,650 paid for state regulatory oversight at the plant and
- \$398,000 expended by the Army Corp of Engineers for work at the Lake Superior site.

Expenditures from Army operations funds and judgment funds that were not in DOD's and the Army's estimates include:

- As a result of a toxic tort case settlement related to contaminated drinking water at the site, the Army reimbursed the Federal Cartridge Company \$3.7 million for the company's share of a settlement in litigation.
- Relative to the above case, the Army settled for a \$1.3-million Army share, which was paid out of the Department of Justice Judgment Fund.
- The Army reimbursed Federal Cartridge \$1.9 million for disposal-related cleanup costs.
- The U.S. government paid \$70,000 on behalf of all other federal potentially responsible parties for cleanup-related expenses at a disposal site in Oak Grove, Minnesota.
- The Army paid an additional \$234,292 for attorney time relating to cleanup.

Cost-Sharing Arrangement

The Army does not plan to pursue Federal Cartridge, the former operator, to share environmental cleanup costs at this facility. However, both Alliant and 3M, who also produced at the plant, are being held liable for contamination associated with their activities and have agreed to share the cleanup costs.

Federal Cartridge was responsible for manufacturing and testing ammunition, disposing of production waste, and maintaining the facility. Beginning in the early 1980s, the company was also responsible for performing the preliminary environmental damage assessments and engineering evaluations and analyses. At peak production in 1943, according to Army officials, almost all of the 26,000 employees who worked at the plant were contractor personnel. By 1995, the total decreased to about 1,000 employees, and all but about 19 were contractor personnel.

The Army is assuming costs not already covered by the other two private companies and Federal Cartridge believes it has no liability for cleanup costs. Reasons given by the Army are the Secretary of the Army granting indemnification status to the contractor under Public Law 85-804, and

contract clauses that address contractor liability. In addition, Federal Cartridge Company officials stated that disposals were not due to any company wrongdoing, either willful or knowing, and were at state-approved landfills under the review and approval of the Army. Also, they said that the Army did not disapprove of company practices, which were considered state-of-the-art.

However, Army officials have participated in pursuing Federal Cartridge's insurance company to recover cleanup costs associated with the company's operations at the plant. The Army asked the Justice Department to help it recover about \$10.2 million, plus interest, that it reimbursed Federal Cartridge for cleanup-related costs. Negotiations are underway.

Both of the companies that operated on plant property as tenant and lessee are sharing in cleanup costs.

- Alliant produced ammunition for the Army as a tenant using government facilities, but Alliant's facility contract did not contain indemnification provisions. In 1995, an attorney for Alliant estimated that the company had paid over \$10 million since the 1985 apportionment agreement, whereby Alliant is to pay the cleanup costs at the South plume, and the Army is responsible for costs at the North plume. The cost of cleaning up groundwater where the origin of contamination is unclear will be split between the parties, with the Army paying 80 percent and Alliant 20 percent.
- The 3M Company produced for the commercial market under a lease with the Army. The company is solely responsible for cleanup of radioactive contamination of property on the site. The company has cleaned up the contaminated buildings and soils, but the Army has not yet examined and approved 3M's cleanup actions.

Lake City Army Ammunition Plant

The Lake City Army Ammunition Plant is the Army's only installation that now manufactures small-caliber ammunition. The plant, which occupies about 4,000 acres in a rural area near Independence, Missouri, began operating in 1941. Remington Arms operated the facility until 1985, when the current contractor, the Olin Corporation, took over.

Manufacturing operations at the Lake City plant generated hazardous wastes. Soil has been contaminated with explosives; volatile and semivolatile organic compounds; oil and grease; low-level radioactive

materials; and such metals as arsenic, lead, mercury, and zinc. Groundwater was contaminated with dichloroethylene, lead, and vinyl chloride. Because these contaminants exceed levels set by EPA, groundwater from wells on the installation must be treated before it can be consumed. For example, the EPA maximum contaminant level for vinyl chloride is 2 parts per billion, but the drinking water aquifer at the plant contained 8,000 parts per billion.

According to test results and studies, contamination has not yet migrated off the site but will do so eventually, unless preventive action is taken. Because the site is located in a rural, sparsely populated area, no immediate threat exists to the groundwater of surrounding communities. The Lake City plant was placed on EPA's National Priorities List in 1987.

Cleanup Efforts

The contaminated areas at the plant are divided into four units. Preliminary assessments and site inspections were conducted in 1979. EPA and the Missouri Department of Natural Resources approved the remedial investigation for one unit in March 1995. Another was completed in May 1995, but awaits EPA and Missouri approval. The Army is not proceeding with remedial investigations for the other two units until it receives comments from EPA and the state of Missouri on the May 1995 investigation report and a feasibility study submitted in June 1995 for the first unit. The proposed corrective actions mainly involve groundwater treatment and soil excavation.

Cleanup Cost Estimates

Both DOD and Army estimates increased from fiscal year 1993 to 1994. The DOD estimate increased from \$52 million to \$339.2 million, while the Army estimate increased from \$24.8 million to \$168.1 million. Army officials attributed the increase to including long-term cleanup costs beyond 2001. Earlier estimates considered only a 7-year budget cycle.

DOD's estimate was more than double what Army officials at the plant reported to us for the same time frame. Lake City officials believed their estimate was accurate, and they did not know why DOD's estimate was so much higher. According to a DOD official, it might have been due to a data entry error. The difference was generally resolved with DOD's May 15, 1996, report for fiscal year 1995, which updated the figure to \$139.4 million.

Lake City officials stated that it is difficult to accurately project the cost of cleanup until options have been selected and approved by EPA and the

state regulatory agencies. We found about \$22.9 million in costs that were not included in either DOD or Lake City estimates.

- Remediation may take longer than the year 2024 estimated, thus increasing costs by \$16.8 million. The feasibility study for one operating unit stated that the contaminated water should be pumped, treated, and monitored for at least 50 years, or until 2048. The Army's estimated cost for such remedial action was about \$700,000 a year, including \$500,000 for pumping and treating the water and \$200,000 for monitoring.
- Costs excluded an estimated \$6 million to clean up low-level radioactive contamination caused by ammunition made from depleted uranium. The cost was excluded from DOD and Army estimates because the cleanup will be conducted under the direction of the Nuclear Regulatory Commission.
- The state was paid \$91,000 for oversight costs.

Also, the use of a residential cleanup standard as opposed to an industrial cleanup standard could increase the cost of cleaning one area by about \$23.6 million, from \$5 million to \$28.6 million. The cleanup standard for an industrial site assumes human exposure of 40 working hours per week, whereas a residential standard assumes continuous human exposure of 168 hours per week. The Army estimates it will cost \$5 million to remediate the contamination at its Area 18 Operable Unit to the industrial standard. However, the EPA and the state of Missouri believe that the residential cleanup standard should be used.

Cost-Sharing Arrangement

The Army does not plan to pursue cost sharing by current or former operators of the Lake City plant. Olin has been the operator since 1985, and Remington operated the plant for more than 40 years. No other private parties, such as lessees, operated at the facility.

Army officials said they do not plan to pursue cost sharing with Olin because of the Secretary of the Army's decision to indemnify plant operators under Public Law 85-804. Likewise, they applied this decision to relieve Remington, Lake City's prior contractor.

Newport Army Ammunition Plant

The Newport Chemical Facility, formerly Army Ammunition Plant, occupies about 7,000 acres in a sparsely populated rural area near Newport, Indiana. The plant, which has been inactive since 1975, currently serves as a storage facility for a nerve agent the Army plans to incinerate as part of its chemical material program. The Newport plant was

established in 1941; from then until 1974, several contractors, including E.I. duPont, FMC Corporation, Liberty Powder Corporation, and Uniroyal, Inc., produced explosives such as trinitrotoluene (TNT) and chemical agents. The current operator for the storage function is Mason & Hanger.

Manufacturing operations at the Newport plant generated various hazardous wastes. Soil, groundwater, and surface water were contaminated with explosives, solvents, heavy metals, oils, and grease. Groundwater contaminated with carbon tetrachloride and trichloroethylene has not yet migrated off the site, but EPA and Army officials are concerned that it may. If contaminated groundwater reaches the plant's boundaries, it could threaten the safety of the surrounding area's drinking water.

Cleanup Efforts

Preliminary investigations were completed in 1986. The Army identified 16 sites, 12 of which it believed required some remedial action or additional study. The Army classified four sites requiring no further action, but EPA disagreed and is requiring additional testing and monitoring activities for these four sites. The Army removed underground petroleum storage tanks and currently plans to remove other contaminants. Investigations and studies are continuing.

Cleanup Cost Estimates

DOD's estimate of the cleanup costs for the Newport plant was higher than the Army's. DOD's report for fiscal year 1994 put the total cost at about \$55.5 million, as compared to an Army estimate of \$41.5 million. Officials could not reconcile the difference, but said part could be explained by DOD's estimated completion in 2010, versus the Army estimate of 2006. DOD's report for fiscal year 1995 increased the estimate to about \$68 million, with completed cleanup still estimated for 2010.

A cost not reflected in either DOD or Army data was about \$120 million for a chemical plant cleanup that was excluded because that effort will be funded by the Chemical Munitions Destruction Defense Account, not DERA.

Army officials stated that costs cannot be accurately estimated until more is known about the sites. Until the contamination is known and the remediation methods are selected, the costs of remediation options can vary significantly. For example, the Army's cost estimate assumed that the service will incinerate contaminated soils, but Army officials said that soils

may be cleaned up biologically through composting at about half the cost of incineration.

Cost-Sharing Arrangement

Army officials do not plan to pursue cost sharing by the current or any past operators of the Newport plant. They said this is because of the Secretary of the Army's decision to indemnify plant operators under Public Law 85-804.

Navy Case Studies

We visited two active Navy GOCO manufacturing facilities: the Allegany Ballistics Laboratory, Mineral County, West Virginia, and the Naval Industrial Reserve Ordnance Plant, Fridley, Minnesota. Both facilities have been in operation since the early 1940s. The Allegany facility was operated by Hercules, Inc., until Alliant Techsystems purchased Hercules and took over operations in 1995. The Fridley facility also involved changes in ownership. The Northern Pump Company operated the facility from 1942, until FMC purchased a subsidiary of Northern in 1964.¹

Agency Cost-Sharing Policy

The Navy has had a policy since 1989, which states that the government and current and former contractors share the liability and responsibility for cleaning up GOCO facilities. The current contractor is to pay all cleanup costs associated with its operation of the facility unless the operating contract contains provisions to the contrary. According to a Navy official, the Navy has the right to seek reimbursement from prior contractors for the costs it incurred for cleaning up contamination resulting from their activities.

Navy officials stated that GOCO operational decisions, including those about disposal, were left to its contractors, and the Navy had little presence at its GOCOS. Contractors operated the facilities under a facilities-use contract to provide goods and services for the Navy without direct Navy management of operations.

According to the Navy's cost-sharing policy, if further study and remediation are recommended after initial cleanup research, the Navy command is required to immediately begin discussions with the GOCO contractor regarding responsibility for and participation in the cleanup effort. Participation is also to be discussed prior to cleanup, including any removal or interim actions. According to Navy legal representatives, the policy provides contractors an opportunity to participate in the cleanup process as a means of reducing litigation risk—that is, a contractor that participates in the cleanup process is less likely to argue that cleanup costs were excessive or unnecessary.

If the contractor declines to participate, all cleanup costs are to be identified for possible future recovery from the contractor. Despite its 1989 policy, the Navy has not initiated timely requests for contractor participation in the cleanup. The Navy did not send a letter requesting

¹The operations by Northern Pump to 1964 were through a subsidiary, Northern Ordnance, Incorporated. FMC operations from 1994 were by a subsidiary, United Defense Limited Partnership.

contractor participation until 1994 at one of the two facilities we visited and has not begun the required negotiations with the second facility.

At both the facilities we visited, some of the contamination related to production for the Navy at contractor-owned property adjacent to the government-owned sites. In one case, the contamination was on the contractor property, and in the other, it had been transferred to the Navy property.

Navy officials said the Navy will likely clean up its facilities and then decide whether to seek a share of the costs from the operators. They provided a number of explanations for not pursuing cost sharing more actively: (1) operators who help pay for the cleanup may later get reimbursed for the expenditures; (2) a divisive liability issue might drive a wedge into an otherwise productive relationship between the Navy and its contractors; (3) cost-sharing negotiations could slow the cleanup; and (4) cost recovery is easier after the cleanup is done, because all costs, contamination, and responsible parties will have been identified, and the costs can then be allocated to the responsible parties based on their contributions.

Allegany Ballistics Laboratory

Since 1945, the Allegany Ballistics Laboratory has researched, developed, produced, and tested solid propellant rocket motors on about 1,600 acres in Mineral County, West Virginia, about 10 miles southwest of Cumberland, Maryland. The laboratory has been operated by Hercules, Inc., for all but 2 of its 54 years in operation. George Washington University, under contract with the Army, operated the laboratory from 1943 until 1945, when Hercules, Inc., took over operations under a Navy contract. In 1995, the laboratory's current operating contractor, Alliant Techsystems, purchased the division of Hercules that had been operating the facility.

Hercules also began operating commercial businesses on and adjacent to the laboratory in 1967. Hercules purchased 56 acres adjoining the laboratory in 1967 and built a propellant production facility. In addition to rocket development, Hercules began operating a commercial automobile testing business at the GOCO facility in 1973. According to a Navy study, no written agreement exists between the Navy and Hercules regarding the use of laboratory property for the disposal of waste generated by the adjacent Hercules-owned facility.

Manufacturing operations at the laboratory, as well as disposal of contaminated waste produced at the nearby commercial plant, have generated hazardous waste. This waste contaminated soil and groundwater with trichloroethylene, explosives, and volatile and semi-volatile organic chemicals, and the laboratory was placed on the EPA National Priorities List in 1994. Navy officials do not believe the contractor's on-site automobile testing business contributed to the contamination. However, some of the contamination at the laboratory stemmed from burning of propellant-contaminated waste from the adjacent contractor-owned production facility.

Cleanup Efforts

Multiple studies and investigations have been performed, starting with environmental studies initiated in fiscal year 1983 that identified 11 sites and a later study in fiscal year 1986 that recommended further study at 8 sites. A subsequent assessment in fiscal year 1993 identified an additional 105 sites and only recommended further action at 30 of the sites. As of September 1994, the Navy reported that remedial actions should be completed by fiscal year 1998. DOD reported in March 1995 that cleanup-related operations were expected to continue to fiscal year 2010. Navy officials later stated they expect the study phase to be completed in fiscal year 2003, remedial actions to be completed by fiscal year 2010, and long-term operations to be completed in 2025. According to the officials, limited DERA funding and the unavailability of field data have delayed cleanup efforts.

Cleanup Cost Estimates

The Navy's cleanup cost estimates for the laboratory increased from about \$18.7 million in fiscal year 1993, to \$27.8 million in 1994, and \$43.5 million in 1995. DOD's estimates were about \$21.2 million, \$30.7 million, and \$24.4 million for the respective years. Navy officials attributed the increases to an extension of the cleanup time frames and a change in the estimating methodology used. The Navy began to use a projection model in July 1994 to project future cleanup costs based on factors such as contamination type and degree of contamination. The Navy attributed the differences between the Navy and DOD for fiscal year 1995 mainly to the different data used. For example, DOD's 1995 reports excluded unfunded Allegany Ballistics Laboratory requirements included by the Navy for fiscal year 1998 and beyond. In addition, the Navy estimate increased because additional investigations revealed more extensive contamination.

Although DOD and Navy sources agreed on expenditures to date, we found other costs totaling 76 percent more than the \$1.3 million reported for 1994. Expenditures not reported in the above sources for Allegany Ballistics Laboratory were (1) \$836,000 that was paid through the Naval Sea Systems Command Operations and Maintenance account, as directed by congressional appropriations language for a remedial investigation; (2) \$60,000 for an initial assessment study funded by the Naval Facilities Engineering Command; (3) \$45,460 provided by the U.S. Army Corps of Engineers in DERA funds to the state of West Virginia for regulatory oversight and technical assistance; and (4) \$45,285 paid to EPA through the Superfund for oversight. Also, costs beyond 1994 for EPA oversight are expected to exceed \$667,000.

Cost-Sharing Arrangement

According to Navy officials, the contamination at the laboratory resulted from the contractor's operation of both the laboratory and the adjacent contractor-owned facility. The Navy sent a letter on February 22, 1994, asking that Hercules, the facility operator for more than 50 years, participate in financing the laboratory cleanup. Hercules declined to participate, saying that the Navy had assumed all responsibility for the cleanup. Hercules stated that it would also bill the Navy for cleanup-related costs incurred in managing the restoration contractor, because it considers such costs to be above and beyond its normal operating costs.

Navy officials agreed that their 1994 letter to Hercules was not timely, but said the Navy will continue to clean up the facility and then determine whether to pursue a cost-sharing arrangement with Hercules. They said their decision to pursue Hercules will be based on such factors as evidence, litigation risk, and the level of independence of the contractor. Further, Navy officials stated that the Navy has never had a significant presence at the laboratory, leaving the contractor free to make operational decisions, including those involving disposal. In the 1960s, about 40 government employees worked on site with 3,200 contractor personnel. In the 1990s, about 4 government staff worked with 500 contractor personnel.

Naval Industrial Reserve Ordnance Plant, Fridley

The Naval Industrial Reserve Ordnance Plant, Fridley, occupies about 83 acres in the city of Fridley, Minnesota, within the Minneapolis-St. Paul metropolitan area. Since 1941, the plant has produced gun mounts, torpedo tubes, and missile-launching systems. With changes in ownership, the same company has operated the plant for more than 54 years.

Northern Ordnance, Inc., formerly a subsidiary of Northern Pump Company, operated the facility from 1942 to 1964. At that time, FMC Corporation purchased the company and continued operations until 1994, when United Defense Limited Partnership, a subsidiary of FMC, took over the plant's operations.

Manufacturing at Fridley generated hazardous waste that contaminated soil and groundwater with petroleum, oil, and other lubricants, and such volatile organic chemicals as trichloroethane. Contamination has resulted from a leaking sewer system under one of the plant's production buildings. The plant was placed on EPA's National Priorities List in 1989. Contamination was also discovered at off-site locations, including the operating contractor's private facility next to Fridley and three municipal landfills. From the 1940s through 1969, the contractor disposed of chemicals and other hazardous waste materials on 18 acres it owned south of the Fridley facility. In addition, FMC disposed of foundry sand at landfills in Andover, East Bethel, and Oakgrove, Minnesota, and it was subsequently named as a potentially responsible party under CERCLA. Chemicals now considered to be carcinogens were reportedly detected in the foundry sand, but FMC stated that the chemicals were absorbed by the sand after its disposal at the landfill.

Cleanup Efforts

The Fridley site was divided into three units for investigation and cleanup: groundwater, soils around the building, and soils under the building. A 1990 record of decision for the first unit called for initially pumping and treating contaminated groundwater and discharging it into a sanitary sewer. Later, a permanent groundwater extraction system would treat groundwater for discharge to the Mississippi River. The final remedy for the second unit is being developed. It involves containing contaminated soils and buried drums of waste, and later removing the contamination. For the third unit, the remedial investigation begun in September 1996 will serve as the basis for further studies and actions.

Cleanup Cost Estimates

Total cost estimates for Fridley increased from fiscal year 1993 to 1995. DOD's estimate increased from \$13 million in fiscal year 1993, to about \$37.9 million in 1994, and \$49 million in 1995. The Navy's estimate increased from about \$17 million in 1993 to \$30.7 million in 1994, and \$52 million in 1995. Navy officials attributed the 1993 and 1994 increases to changes in estimates of future cleanup activities, completion dates, and related costs. Also, the Navy used a projection model in July 1994 to

estimate future cleanup costs, based on such factors as the type and degree of contamination. For 1995, Navy officials attributed the large increase to additional investigations that revealed more extensive contamination needing cleanup. Navy officials indicated that the latest difference between DOD and Navy estimates resulted from a reevaluation of the cleanup program between the time the Navy and DOD estimates were prepared.

We found additional costs of about \$4 million not reported by either DOD or the Navy. Neither included the following:

- Contractors were paid \$3.1 million for off-site cleanup. (The Navy reimbursed FMC \$1.9 million that FMC had paid to clean up its private facility next to Fridley. The Navy also reimbursed FMC about \$1.3 million for costs incurred to clean up three municipal landfills where it had disposed of waste from the Navy-owned Fridley sites. The reimbursements total \$3.1 million, with rounding. According to a DOD official, the state of Minnesota may reimburse some of the money to FMC and thus to the Navy.)
- EPA was paid \$481,000 through the Superfund for oversight and technical assistance.
- Approximately \$106,000 was paid by Army Corps of Engineers to the state of Minnesota for regulatory oversight and technical assistance.
- The Navy paid \$269,000 for cleanup before DERA funds were available.
- A study funded by the Naval Facilities Engineering Command cost \$60,000.

Costs beyond 1994 for EPA oversight are expected to exceed \$1.78 million.

DOD's report for fiscal year 1994 did not show any projected cleanup costs for 1995 and 1996. This was corrected in the 1995 report, which showed total reported cost of about \$8 million.

Cost-Sharing Arrangement

Navy officials said the Navy will clean up the Fridley facility and then determine whether to pursue cost sharing with FMC. According to Navy officials, the Navy has never sent a letter to FMC requesting financial participation in the cleanup, but did request the contractor to review and comment on the Navy's new cleanup policy in September 1989. In its October 1989 response, FMC disagreed with the Navy's policy to "require current GOCO contractors to pay for any and all cleanup costs associated with their operation of Navy facilities." According to the FMC response, the nature of the company's relationship with the Navy and related

contractual obligations does not justify it paying for cleaning up the hazardous waste sites associated with its operations.

FMC stated that under its contract, it is required to perform only normal maintenance on the facility: "Remediation of hazardous waste sites at the facility would clearly fall in the category of maintenance over and above normal maintenance that would either be performed by the Navy or by FMC at Navy expense." However, according to a Navy official, the contractor was free to make operational decisions at the facility, including those involving disposal. He stated the Navy never had significant presence at Fridley. For example, in the 1970s, about 70 or 80 government employees worked onsite with about 2,000 contractor personnel, and in the 1990s, about 60 government employees worked with 1,500 contractor personnel.

As noted above, the Navy reimbursed FMC \$1.9 million for costs to clean up the contractor's facility adjacent to Fridley. Following a contracting officer's final decision to deny FMC its requested reimbursement of \$2.2 million, FMC appealed to the Armed Services Board of Contract Appeals. According to a Navy legal official, after extensive discussion, the decision to pay FMC was based on litigation-related risk and cost. The reimbursement was reduced to \$1.9 million because FMC recovered \$275,000 through an action against Northern Pump Company, the former parent company of the subsidiary that FMC purchased in 1964. FMC filed a claim with its insurance company to recover some of the private facility's cleanup costs.

In addition to the previously noted \$1.3 million Navy reimbursement to FMC for the company's cleanup costs at the three municipal landfills, FMC has requested another \$1.3 million for these facilities. A DOD official indicated that part of these past costs may be recovered because the state of Minnesota is reimbursing companies involved in settlements to pay for cleaning up the landfills. If FMC receives such a payment, DOD is to be reimbursed its share.

Air Force Case Studies

We visited two active Air Force manufacturing facilities: Air Force Plant 4 in Fort Worth, Texas, and Plant 44 near Tucson, Arizona. The 2 plants are among 4 the Air Force plans to retain following divestiture, thereby reducing Air Force GOCO plants from a post-World War II high of over 100 to the current 9.

Agency Cost-Sharing Guidance

Cleanup at the nine remaining Air Force GOCOs is expected to exceed \$245 million. The Air Force Deputy General Counsel issued guidance in December 1995 that deals with cost-sharing arrangements with other potentially responsible parties, including plant operators. The guidance states that there is substantial legal rationale for negotiating shared responsibility for environmental remediation costs, based on the facts of the situation, especially where the contractor may have liability insurance. The guidance recognizes that CERCLA "contemplates that potentially responsible parties, including both the owner and the operator, are responsible and will share the costs of environmental remediation." It states that "there should be neither an assumption that the government is responsible for and will pay 100 percent of a company's environmental remediation costs, nor an assumption that the government would not pay for any of these costs under other contracts or continuing liability under the GOCO contract."

According to an Air Force memorandum, the Air Force now begins cost-sharing negotiations by proposing equal sharing of costs between the Air Force and plant operators unless evidence shows that the government or operator had a greater responsibility, or other responsible parties were identified. The memorandum noted that equal sharing is an appropriate starting place for negotiations because the Air Force has never exercised day-to-day control over the work of GOCO plant operators and thus has had little or no ability to control contractors' compliance with environmental laws and regulations.

The Air Force recently completed cost-sharing negotiations with a GOCO operator. Thiokol, the former operator of Plant 78 in Utah, has agreed to equally share with the Air Force the costs related to cleaning up contamination at the plant. According to Air Force officials, the decision to pursue cost-sharing at other locations will ultimately depend on whether the service identifies other responsible parties at each plant.¹

¹In another instance, the Air Force has negotiated a cost-sharing settlement with Aerojet, the operating contractor at Air Force Plant 70 in Sacramento, California. Aerojet has agreed to pay 35 percent of cleanup costs associated with its products. The Air Force is to pay the other 65 percent of what DOD and EPA officials estimate will be hundreds of millions of dollars in cost.

Air Force officials stated that the Air Force's cost recovery efforts have been hindered by indemnifications of other DOD contractors and other factors. Budget cuts have delayed searches for other responsible parties, and the Air Force does not have the financial management systems needed to track all environmental cleanup costs for recovery purposes. Contractor officials at the two plants we visited believe they are not liable for environmental cleanup costs and cited various contract provisions. They also stated that contractor reimbursements by the government for environmental cleanup costs are not prohibited by law or regulation. According to Air Force officials at the two sites visited, the Air Force intends to pay for cleanup and then recover costs from other responsible parties.

Air Force Plant 4

Air Force Plant 4, Fort Worth, Texas, began operations in 1942, when Consolidated Aircraft manufactured B-24 bombers. General Dynamics operated the plant from 1953 until 1993, when Lockheed acquired General Dynamics' Fort Worth operations. These Lockheed operations now produce F-16 fighter jets, spare parts, radar units, and missile components.

Manufacturing at Plant 4 generated hazardous waste, including waste oils, fuels, paint residues, solvents, heavy metals, and process chemicals. Groundwater and soil were contaminated, primarily with trichloroethylene, chromium, and petroleum byproducts. Four major plumes of groundwater contamination originate at the plant and extend offsite, including two plumes that are contaminating the drinking water aquifer that serves as a municipal water source for the City of White Settlement. In addition, the contaminated drinking water aquifer is near a creek that borders the plant. This creek discharges into the Lake Worth Reservoir, which is the primary drinking water source for Fort Worth. Plant 4 was placed on EPA's National Priorities List in August 1990.

Cleanup Efforts

Site investigations began in 1984, and the Air Force has begun six ongoing remedial actions since 1992. These actions consist primarily of groundwater pump-and-treat, extraction of vapors from soil, and excavation and disposal of contaminated soil. Based on a November 1994 Air Force Material Command review of the cleanup program at Plant 4, the Air Force canceled its plans to build a \$25-million groundwater treatment system because monitoring indicated that the contaminants in the groundwater are slowly biodegrading. According to the Air Force remedial project manager for Plant 4, remedial actions will be taken only for sites

that present an immediate risk, such as contaminated soils or areas where contaminated groundwater is affecting drinking water. The remedial project manager expects regulatory approval of a record of decision, documenting the final plan for cleaning up the site, in 1997.

Estimated Cleanup Costs

According to Air Force field estimates, cleanup at Air Force Plant 4 will cost \$79.6 million, which is over \$16 million more than the nearly \$63 million reported in DOD's fiscal year 1994 and 1995 reports to Congress. Most of the difference between the two estimates related to future costs.

The field estimates were prepared by the Aeronautical Systems Center in Dayton, Ohio, which is responsible for managing Air Force GOCO plants and the associated environmental cleanup activities. DOD's estimate was based on Air Force headquarters information from an automated cost-estimating program that considers, among other things, historical information from similar sites where cleanup has been completed.

Regardless of which estimate is more accurate, both excluded some cleanup costs, although the total excluded is unknown. According to Air Force officials, these included such expenses as those incurred prior to 1984, costs claimed through overhead, projects paid for with compliance funds, and reimbursements to state regulatory agencies for oversight. For example, the field estimate included nearly \$4 million that was used for preliminary assessments, site investigations, and interim remedial actions in 1983 and 1984. DERA funds were not available prior to 1984.

A Center official said that costs can be estimated only roughly until a record of decision has been signed, confirming the cleanup remedy decision. For example, DOD's fiscal year 1993 estimate of \$113 million was reduced in 1994 to \$63 million partly because of the previously cited decision to cancel a major groundwater treatment facility. The facility became unneeded when the Air Force found that the hydrogeologic conditions at the affected site were conducive to natural biodegradation.

Cost-Sharing Arrangement

The Air Force has paid all the costs of the plant's cleanup to date. A decision about whether to pursue recovery of any of those costs depends on the Air Force's search for responsible parties, which will be conducted in fiscal year 1997. General Dynamics and Lockheed officials believe that existing and former contracts obligate the Air Force to pay for all environmental cleanup costs. Lockheed officials believe that cleanup costs

incurred by contractors are normal costs of doing business and thus generally allowable, as long as they are reasonable, allocable, and meet other provisions of contracts. According to General Dynamics, the agreement between General Dynamics and Lockheed for the sale of the Fort Worth Division set forth how the parties would allocate the environmental liability if costs were not reimbursed by the Air Force. Contractor officials noted that this agreement did not constitute an admission of liability.

Air Force Plant 44

Air Force Plant 44, in Tucson, Arizona, has been operated by Hughes Missile Systems Company since its 1951 construction. Hughes currently produces electronic and tactical missile systems at the plant.

Manufacturing at Plant 44 generated hazardous waste that contaminated soil and groundwater. Contaminants included trichloroethylene as well as chromium and other metals. The Tucson International Airport area, contiguous to Plant 44, was placed on the National Priorities List in 1983, and Plant 44 is a unit within that site because it is one of four source areas that contributed to a large groundwater contamination plume.

Cleanup Efforts

Site investigations began in 1981, when the Air Force initiated a groundwater monitoring program. Based on a 1986 record of decision, a groundwater remediation program began with a pump-and-treat system and numerous extraction and recharge wells. The contaminated plume has since been reduced by nearly 70 percent and has broken into several smaller plumes, according to Air Force and contractor officials, but contamination still exceeds that allowed by EPA for drinking water. The Air Force submitted a separate Plant 44 feasibility study to EPA in January 1995 and is developing several cleanup strategies, including a cleanup remedy to accelerate the soil cleanup.

Cleanup Cost Estimates

At the time of our review, Air Force field estimates indicated total cleanup at Plant 44 would cost about \$90.9 million by 2002, which is higher than either the \$61.3 million reported in DOD's fiscal year 1994 report to Congress, or the \$73.6 million in DOD's subsequent 1995 report. According to Air Force officials, the database used to prepare the DOD estimate in both years was missing nearly \$19 million in historical DERA costs. Air Force headquarters officials believed that field data are more accurate for

historical costs because the records of actual obligations reside in the field.

Air Force headquarters officials told us that projected costs differ because headquarters used an automated cost-estimating system. Headquarters officials believe their projections, which were lower than the field's in both the 1994 and 1995 reports, will prove to be more realistic. According to the Plant 44 remedial project manager, his estimates are more accurate because they are based on contracted studies and historical cost figures for operating a groundwater treatment plant.

Historical cost estimates from DOD and the field excluded costs funded by sources other than DERA, such as costs incurred prior to the account's establishment in 1984, costs claimed by contractors through overhead charges, more than \$50,000 paid to state regulators for oversight, and cleanup costs paid out of compliance funds. For example, the plant has spent over \$3 million in compliance funds on cleanup projects and may similarly use another \$3 million that is currently obligated to compliance projects.

Cost-Sharing Arrangement

In accordance with the December 1995 Air Force guidance for cost sharing at its GOCO plants, Air Force officials plan to search for responsible parties in the future at Plant 44, depending on the availability of DERA funds. Hughes officials disclaim responsibility for sharing the cleanup costs, saying the Air Force is contractually obligated to pay for all historical environmental cleanup costs. We reported in July 1994² that a 1987 memorandum from the former Air Force Systems Command said that Hughes was indemnified from responsibility for past groundwater contamination. Our November 1994 report noted that Air Force officials did not believe that the memorandum indemnified Hughes. According to an Air Force attorney, Air Force officials will not make a formal decision about Hughes' potential liability until cost recovery becomes an issue.

Hughes entered into a new lease agreement with the Air Force that makes Hughes liable for all environmental claims resulting from releases that arise from acts or omissions occurring on or after the effective date of the lease. Hughes and the Air Force are to be each equally liable for claims resulting from unknown conditions after the lease's effective date, up to a

²Environmental Cleanup: Defense Indemnification for Contractor Operations (GAO/NSIAD-95-27, Nov. 25, 1994).

Appendix III
Air Force Case Studies

dollar ceiling for Hughes. According to an Air Force attorney, the dollar total is proprietary information.

Defense Logistics Agency Case Studies

We visited two Defense Fuel Support Points managed by DLA at Norwalk, near Los Angeles, California, and Ozol, near Oakland, California. These fuel support points, among 25 worldwide, are operated by contractors for DLA's Defense Fuel Supply Center. The center purchases bulk refined petroleum products, coal, natural gas, and synthetic fuels for the military services and federal civilian agencies around the world.

Agency Cost-Sharing Policy

The Defense Fuel Supply Center policy and practice have been to recover most cleanup costs for past contamination through a fuel surcharge assessed to its customers, rather than with DERA funds. This surcharge, according to a Center official, is about 1 cent per barrel. We found no evidence that the Center has recovered environmental cleanup costs from its former operators. Current operators are to be held responsible for a fuel spill if they are negligent in attending to a leak on the facility.

The center does not have a written policy that directs the investigation of cost-sharing opportunities with potentially responsible parties such as former owners, lessees, or neighboring properties. A complicating factor for DLA's cost sharing in fuel-related cleanups is that CERCLA excludes certain petroleum products from the definition of hazardous substances. In such cases, joint and several liability under CERCLA may not apply, and DLA may need to either negotiate with other responsible parties or bring legal action against them to recover contamination-related damages at its facilities.

In discussing this issue, a center official stated that the center has considered developing a cost-sharing policy to encourage cost recovery and consistency in cost-sharing approaches. According to center officials, the center has an unwritten policy to pursue cost recovery. In addition, they believe that the existing general guidance on property damage should have the same effect, if followed.

Defense Fuel Support Point, Norwalk

DLA's Norwalk facility is a 50-acre fuel storage depot in Los Angeles County, about 20 miles southeast of the city of Los Angeles. From 1923 until 1951, the Norwalk site was owned by a number of private oil companies. In 1951, the site was purchased by the Air Force. DLA has operated the facility since 1968. Tenco Services, Inc., has been the operating contractor of the facility since 1992. Santa Fe Pacific Pipeline leases about 2 acres of land at the facility and has operated a fuel pump station there for over 25 years.

Contamination exists both on and off the site in the form of oil-contaminated soils and underground fuel plumes resulting from fuel leaks. Three contamination plumes have been identified on site; one stemmed largely from the lessee's activities. A fourth plume is off site and resulted from a 200,000-gallon leak from a center pipeline under an intersection in the nearby town of Tustin.

Cleanup Efforts

From 1991 through 1994, several assessments were performed at the facility, and monitoring wells and soil borings were installed and drilled. In 1992 and 1993, a total of about 3,300 gallons of liquid hydrocarbons were removed by a recovery system that was installed for the Santa Fe plume within the southern portion of the facility. Another project removed 4,713 gallons of liquid hydrocarbons from seven off-site wells adjacent to the site during 1992 and 1993.

Delays have slowed investigations at the off-site location, and damage has not yet been fully characterized. According to Norwalk officials, gaining access to the surrounding properties to install test wells has been the major obstacle.

Cleanup Cost Estimates

According to Center officials, the Norwalk facility's on- and off-site cleanup will cost about \$16.5 million, about half for each portion, and will be completed in 2010. The estimate was submitted to DOD and was accurately reflected in DOD's annual reports to Congress for fiscal year 1994, but was excluded from its 1995 report.

A factor that could affect DLA costs includes private party leasing of part of the facility. The lessee was expected to contribute \$7.5 million toward the facility's cleanup cost. Additional costs that could arise include four claims totaling about \$1.6 million that nearby property owners have filed against the center. The claims allege that contamination from the site has reduced the owners' property values or prevented them from developing or selling their properties. Center officials have not included any amount for claims in their estimate because the claims have not been decided.

The center also prepared a worst-case estimate for Norwalk, with total costs of about \$34.7 million. According to officials, the higher estimate reflects not a more expensive cleanup remedy, but potential increases in the cost of testing, monitoring, operations and maintenance, system

installation, pump replacement, and other such activities. Completion would still be expected in 2010.

Cost-Sharing Arrangement

The center is not attempting to recover any cleanup costs from present or former contractors at the site. An investigation performed at this site identified Santa Fe Pipeline, the lessee, as a potentially responsible party for this site. The center and Santa Fe are currently negotiating cost sharing for cleanup, and center officials believe that the company will fund about \$7.5 million in cleanup costs.

Center officials have not identified any possible cost recovery options for Norwalk's off-site cleanup at the Tustin intersection, a cleanup that is expected to cost between \$8 million and \$13 million. Officials of the operating contractor believe that a third party may have damaged the center's pipeline by digging in the intersection to install a separate pipeline. A Defense Fuel Region West official believes that DLA center officials could have been more aggressive in attempting to identify the responsible party when the leak was first discovered. Center officials stated that little, if any, evidence was gathered to prove that another party damaged the pipeline.

Defense Fuel Support Point, Ozol

The Ozol facility is a fuel storage depot near the town of Martinez, California, about 25 miles northeast of Oakland. The facility was constructed in 1959 by the Holley Corporation and leased to the federal government until the Air Force purchased the facility in 1980. DLA has managed the facility since 1980, and Tenco Services, Inc., operated it from 1990 until now.

Aviation gasoline and jet fuel are present in soil and groundwater around and beneath the storage tanks, apparently from leaks in the tanks and pipes. Four distinct groundwater fuel plumes have been identified.

Cleanup Efforts

In 1985, a pilot recovery system was installed to remove fuel and its byproducts southwest of the lower tank area. This recovery system consisted of a collection trench/recovery well, air stripper, and recovered fuel holding tank. In addition, a small, low-volume, passive oil/water separator was installed to remove fuel north of the upper tank field. However, both of these systems have been taken out of use pending establishment of the selected final remedy.

Cleanup Cost Estimates

According to center officials, cleanup at the Ozol facility will cost about \$6.4 million. This estimate was accurately reflected in DOD's annual report to Congress for fiscal year 1994, but was excluded from the 1995 report. Officials expected that the cleanup will be completed in 2002.

The center's worst case estimate totals about \$37 million, with cleanup completed in 2017. The differences in treatment costs would arise if active pump-and-treat and vapor-removal systems were required, rather than the current plan to allow contaminated soils and groundwater to naturally biodegrade.

Cost-Sharing Arrangement

The center is not attempting to recover any cleanup costs from present or former contractors at the site because center officials do not believe that contractor action caused the contamination. According to a DLA legal official, DLA is not pursuing cost recovery from the former owner of the site because it believed the contamination involved occurred after transfer of the property in 1980.

Comments From the Department of Defense



OFFICE OF THE UNDER SECRETARY OF DEFENSE

3000 DEFENSE PENTAGON
WASHINGTON DC 20301-3000

09 DEC 1996

Mr. David R. Warren
Director, Defense Management Issues
National Security and International
Affairs Division
U.S. General Accounting Office
Washington DC 20548


Dear Mr. Warren:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft report dated October 30, 1996, "ENVIRONMENTAL CLEANUP: Inconsistent Cost-Sharing at DoD Government-Owned Contractor-Operated Sites," (GAO Code 709124/OSD Case 1245).

As indicated in the DoD official oral comments to the draft report, the Department partially concurs with the GAO recommendations to (1) issue guidance to DoD Components to resolve current disparities and to promote future consistent treatment of all parties in cost reimbursement and recovery decisions, (2) direct the military services and DLA to identify whether parties other than the government were involved with any contamination, as part of all environmental cleanup preliminary assessments at GOCO facilities, (3) direct the military services and DLA to obtain all relevant data regarding other responsible parties identified, whether or not wrongdoing is an issue, (4) direct the military services and DLA to gather and maintain the most timely and accurate cost data available in DLA, military service, and other agencies' records, and (5) direct the military services and DLA to provide consistent estimates, including all cleanup costs for DoD's environmental reports to Congress, regardless of the source of funds.

Enclosed is the specific DoD position on each of these recommendations.

Very truly yours,



Sherri W. Goodman
Deputy Under Secretary of Defense
(Environmental Security)

Enclosure

Environmental Security  *Defending our Future*

Appendix V
Comments From the Department of Defense

Draft Response to Draft GAO Report
"ENVIRONMENTAL CLEANUP: Inconsistent Cost-Sharing at DoD
Government-Owned Contractor-Operated Sites"
(GAO Code 709124) OSD Case 1245
Dated October 30, 1996

Recommendation 1: The GAO recommended that the Secretary of Defense issue guidance to DoD Components to resolve current disparities and to promote future consistent treatment of all parties in cost reimbursement and recovery decisions.

DoD Response: Partially concur. DoD's current policy provides for the proper level of consistency amongst the Military Components while at the same time permitting the flexibility necessary for site-specific assessment and decision-making to ensure fair treatment of all parties. It is DoD policy to comply with the Federal Acquisition Regulation which provides that contractor business expenses are allowable on Government cost reimbursement contracts when they are reasonable in nature and amount, are allocable to the contract, are accounted for in accordance with generally accepted accounting practices, and are not made unallowable by either the contract terms or the cost principles contained in the Federal Acquisitions Regulations. There are currently no additional limitations on the allowability of contractor environmental cleanup costs. When no contractor malfeasance exists, the Federal Acquisition Regulations allowability criteria dictate that the Government should pay its fair share of environmental cleanup costs. On the other hand, it is clear that the Government should not pay any portion of cleanup cost which results from contractor noncompliance with applicable environmental laws and regulations.

To ensure the policy is interpreted consistently across the Services, the Defense Contract Audit Agency issued audit guidance in 1992 regarding the allowability of contractor environmental costs. The guidance interprets, for field auditors, the current general allowability criteria in the Federal Acquisition Regulations as it relates to contractor environmental costs.

As the GAO correctly points out, implementation of cost sharing strategies may differ across the Services and the DLA. As an example, the GAO accurately states that, in 1990, the Secretary of the Army, pursuant to Public Law 85-804, approved the inclusion of indemnification provisions into contracts with 18 Army ammunition plant operations contractors. Those provisions provide, in part, for the indemnification of risks associated with the release of substances regulated by environmental laws and regulations. Requests for reimbursement of environmental cleanup costs under those clauses are reviewed on a case-by-case basis. Any such reimbursement is limited to the terms of the clauses and to those GOCO ammunition facilities where such clauses have been included in the contracts. The Army does not absolve operations/facilities contractors from cleanup liability at all Army GOCO facilities. For example, contractors that operate armament

Appendix V
Comments From the Department of Defense

plants producing engines, tanks and vehicles, or ammunition metal parts only are not indemnified for cleanup liability.

Recommendation 2: The GAO recommended that the Secretary of Defense direct the military services and DLA to identify whether parties other than the government were involved with any contamination, as part of all environmental cleanup preliminary assessments at GOCO facilities.

DoD Response: Partially concur. This is currently being done. In the normal Preliminary Assessment/Site Inspection phase of the cleanup process, potentially responsible parties are identified by the Military Components and informed decisions are made as to whether cost recovery is prudent and cost effective.

Recommendation 3: The GAO recommended that the Secretary of Defense direct the military services and DLA to obtain all relevant data regarding other responsible parties identified, whether or not wrongdoing is an issue.

DoD Response: Partially concur. This is currently being done. In the normal Preliminary Assessment/Site Inspection phase of the cleanup process, potentially responsible parties are identified by the Military Components and informed decisions are made as to whether cost recovery is prudent and cost effective.

Recommendation 4: The GAO recommended that the Secretary of Defense direct the military services and DLA to gather and maintain the most timely and accurate cost data available in DLA, military service and other agencies' records.

DoD Response: Partially concur. DoD should not be required to gather data on non-DERP costs incurred by agencies and organizations outside DoD. In this era of downsizing and reduced budgets, DoD has neither the manpower nor the funds to develop and populate limited use data bases. DoD agrees that timely and accurate cost data available within the Department should be collected and maintained. DoD feels it is meeting this objective through its present accounting systems and financial records.

Recommendation 5: The GAO recommended that the Secretary of Defense direct the military services and DLA to provide consistent estimates, including all cleanup costs for DoD's environmental reports to Congress, regardless of the source of funds.

DoD Response: Partially concur. The Defense Environmental Restoration Program (DERP) Annual Report to Congress is prepared to meet the requirements of 10 USC 2706(a) Report on Environmental Restoration Activities funded under the DERP. This report is not intended to represent all expenses associated with other funding sources (with the exception of the Base Closure and Realignment Account.) Additionally, DoD feels there is no value added to the program to go back and construct non-DERA expenses already expended.

Major Contributors to This Report

National Security and
International Affairs
Division, Washington,
D.C.

Charles I. Patton, Jr
Uldis Adamsons
R. Bruce Brown
Leticia V. Bates
Jerome P. Pederson

Denver Field Office

Patricia Foley Hinnen
Pamela K. Tumler

Dallas Field Office

David P. Marks
Eric R. Erdman

Kansas City Field
Office

Robert G. Hammons
Gary L. Nelson

Los Angeles Field
Office

Gary W. Kunkle
Nancy Merlino