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ENVIRONMENTAL CONTAMINATION

Lessons Learned from the Cleanup of Formerly Used Defense and Military Munitions Sites

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Natural Resources and Environment

June 10, 2009

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Highlights

Highlights of GAO-09-779T, a testimony before the Subcommittee on Federal Workforce, Postal Service and the District of Columbia; Committee on Oversight and Government Reform

Why GAO Did This Study

Under the Defense Environmental Restoration Program (DERP), the Department of Defense (DOD) has charged the Army Corps of Engineers (the Corps) with cleaning up 4,700 formerly used defense sites (FUDS) and active sites that were under its jurisdiction when they were initially contaminated. The 661-acre Spring Valley site in Washington, D.C is one such site. Like many other FUDS, the U.S. Army used the Spring Valley site during World War I for research and testing of chemical agents, equipment, and munitions. Most of the site is now privately owned and includes private residences, a hospital, and several commercial properties. The primary threats at the site are buried munitions, elevated arsenic in site soils, and laboratory waste; perchlorate was also found onsite.

This testimony discusses GAO's past work relating to remediation efforts at FUDS and military munitions sites to provide context for issues at Spring Valley. Specifically, it addresses: (1) the impact that shortcomings in information and guidance can have on decision-making; (2) the impact that incomplete data can have on cost estimates and schedules; (3) how funding for a particular site may be influenced by overall program goals; and (4) how better coordination can increase public confidence in cleanups and facilitate effective decision-making.

GAO has made several prior recommendations that address these issues, with which, in most cases, the agency concurred.

View GAO-09-779T or key components. For more information, contact Anu Mittal at (202) 512-3841or mittala@gao.gov.

What GAO Found

GAO's past work has found significant shortcomings in the Corps' use of available information and guidance for making decisions relating to cleanup of FUDS. For example, in 2002, GAO found that the Army determined that there was no evidence of large–scale burials of hazards remaining at Spring Valley before it had received all technical input. This experience is not unique. In a 2002 national study, GAO reported that the Corps did not have a sound basis for determining that about 1,468 of 3,840 FUDS properties—38 percent—did not need further study or cleanup action. GAO attributed these shortcomings to limitations in the Corps guidance that did not specify what documents or level of detail the agency should obtain to identify potential hazards at FUDS or how to assess the presence of potential hazards.

GAO's past work has also shown that incomplete data on site conditions and emerging contaminants can interfere with the development of accurate cost and schedule estimates. At Spring Valley, the Corps' estimates of cleanup costs increased by about six fold, from about $21 million to about $124 million from fiscal year 1997 through fiscal year 2001. As assumptions about site conditions changed and new hazards were discovered, the estimates continued to rise and currently stand at about $174 million. Again, these problems are not unique. In 2004, GAO evaluated DOD's cleanup of sites with military munitions and found several similar weaknesses in preliminary cost estimates for numerous sites across the country.

GAO's past work has shown that funding available for specific sites may be influenced by overall program goals and other priorities. Spring Valley has received priority funding due to its proximity to a major metropolitan area and high visibility; however, GAO's past work shows that this is usually not the case with most FUDS sites. Over the past 10 years DOD has invested nearly $42 billion in its environmental programs, but it typically requests and receives a relatively smaller amount of funding for environmental restoration activities at FUDS sites compared to funding available for active sites.

GAO's past work has found that better coordination and communication with regulators and property owners can increase public confidence and facilitate effective decision-making for contaminated sites. With regard to Spring Valley, GAO reported in 2002 that the Corps, the Environmental Protection Agency (EPA) and the District of Columbia had made progress because they had adopted a partnership approach to cleanup decisions. However, this kind of cooperation and coordination does not always occur nationwide. For example, in 2003, GAO reported that the Corps only informed states of upcoming work and requested input from them about half of the time. Similarly, GAO found that the Corps did not always communicate with property owners about the decisions it makes regarding contamination at FUDS sites and more often than not did not inform property owners about how to contact the Corps in the event that further hazardous substances were identified at the site.

Mr. Chairman and Members of the Subcommittee:

I am pleased to be here today to discuss GAO's work relating to the Department of Defense's (DOD) remediation efforts at Formerly Used Defense sites (FUDS) and sites with military munitions around the country, which we believe will provide context for the issues faced by the Spring Valley site, in Washington D.C. Spring Valley is one of 4,700 FUDS—properties that DOD owned or controlled and transferred to private parties or other government entities prior to October 1986. Under the Defense Environmental Restoration Program (DERP), DOD is required to identify, investigate, and clean up environmental contamination and other hazards at both active sites and FUDS that were under its jurisdiction when they were initially contaminated. The FUDS inventory includes sites with a variety of cleanup needs. These properties may contain hazardous, toxic, and radioactive wastes in the soil and water or in containers such as underground storage tanks. Other hazards, including unexploded ordnance and unsafe buildings may also be present. As you know, such hazards can contribute to deaths and serious illness or pose a threat to the environment.

The Spring Valley site was originally known as the American University Experiment Station, and covers approximately 661 acres in the northwest section of Washington, D.C. Like many other FUDS, the U.S. Army used the Spring Valley site during World War I for research and testing of chemical agents, equipment, and munitions. After World War I, the majority of the site was returned to private ownership and developed for residential and other uses, becoming the Spring Valley neighborhood. The site now includes American University, about 1,200 private residences, Sibley Hospital, numerous embassy properties, and several commercial properties. During the 1950s and again in the 1980s, American University and others raised concerns about buried munitions in the Spring Valley neighborhood. An Army investigation concluded in 1986 that no large burials of ordnance remained on the site; however, in 1993, the site received a FUDS designation after a contractor unearthed buried military ordnance while digging a utility trench. Investigations of the site expanded, and in 1996, the Army again concluded there were no remaining large ordnance areas; however, follow-on work found additional large-scale hazards, including more than 600 pieces of ordnance, arsenic

contaminated soil, and lab waste. More recently, perchlorate,[1] an emerging contaminant—a term for chemicals or materials lacking a federal regulatory standard, with a potential threat to health or the environment—was also found on the site. Perchlorate is known to cause health problems in certain populations. The estimated total cost for completing the project was $173.7 million in fiscal year 2007, according to the latest Defense Environmental Program Annual Report to Congress.

Although GAO last reviewed the progress of the Spring Valley Cleanup in 2002, since that time we have conducted a number of reviews relating to the management and cleanup challenges that DOD faces when addressing contamination at FUDS and other sites with military munitions across the country. We also currently have two ongoing reviews related to FUDS—one addressing the management of FUDS broadly and one specifically addressing the munitions cleanup program—the latter study was mandated by the fiscal year 2009 National Defense Authorization Act. These reports are expected for release in fiscal year 2010.

My testimony is based on this body of work and will address four main themes and lessons learned that we believe provide context for assessing the progress made at the Spring Valley site. The four themes that my statement addresses include: (1) the impacts that shortcomings in the use of available information and guidance can have on decision-making; (2) the impacts that incomplete data on site conditions and emerging contaminants can have on the development of accurate cost estimates and schedules; (3) how funding available for a particular site may be influenced by overall program goals and other priorities; and (4) how better coordination with regulators and property owners can increase public confidence in cleanups and facilitate effective decision-making.

We conducted our work in accordance with GAO's Quality Assurance Framework, which requires that we plan and perform each engagement to obtain sufficient and appropriate evidence to meet our stated objectives and to discuss any limitations in our work. We believe that the information

[1]Perchlorate is the primary oxidizer in propellants, present in varying amounts in explosives, and is highly soluble. Exposure to perchlorate affects the human thyroid, and certain levels of exposure may result in hyperthyroidism in adults and developmental delays in children.

and data obtained, and the analyses conducted, provided a reasonable basis for the findings and conclusions in these reports.

Background

Under the DERP, DOD is authorized to identify, investigate and clean up environmental contamination and other hazards at FUDS as well as active installations. To that end, DOD has established restoration goals and identified over 31,000 sites that are eligible for cleanup, including more than 21,000 sites on active installations, more than 5,000 sites on installations identified for Base Realignment and Closure (BRAC), and 4,700 FUDS. The DERP was established by section 211 of the Superfund Amendments and Reauthorization Act of 1986 (SARA) which amended the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980. Under the DERP, DOD's activities addressing hazardous substances, pollutants or contaminants are required to be carried out consistent with section 120 of CERCLA. DOD delegated its authority for administering the cleanup of FUDS to the Army, which in turn delegated its execution to the Army Corps of Engineers (the Corps). Funding for cleanup activities comes from the Environmental Restoration and BRAC accounts. The Environmental Restoration account funds cleanup at active sites and FUDS properties and, of the $1.4 billion obligated in fiscal year 2007, FUDS property obligations totaled $116.5 million for addressing hazardous substances and $102.9 million for munitions response.

To be eligible for FUDS cleanup, a property must have been owned by, leased to, possessed by, or otherwise controlled by DOD during the activities that led to the presence of hazards. These hazards may include unsafe buildings, structures, or debris, such as weakened load-bearing walls; hazardous, toxic, and radioactive substances, which includes contaminants such as arsenic, certain paints, some solvents, and petroleum; containerized hazardous, toxic, and radioactive waste, such as transformers and aboveground or underground storage tanks that contain petroleum, solvents, or other chemicals which have been released into the environment; and ordnance and explosive materials, such as military munitions and chemical warfare agents. To determine if a property is eligible for cleanup under the FUDS program, the Corps conducts a preliminary assessment of eligibility to determine whether the property was ever owned or controlled by DOD and if hazards caused by DOD's use may be present. If the Corps determines that the property was owned or controlled by DOD but does not find evidence of any hazards caused by DOD, it designates the property as "no DOD action indicated" (NDAI). If however, the Corps determines that a DOD-caused hazard may be present,

the Corps begins to further study and/or clean up the hazard, consistent with CERCLA. The CERCLA process generally includes the following phases: preliminary assessment, site inspection, remedial investigation/feasibility study, remedial design/remedial action, and long-term monitoring.

To address the release of hazardous substances, pollutants, or contaminants resulting from past practices that pose environmental health and safety risks on both active sites and FUDS, DOD established the Installation Restoration Program (IRP) in 1985 under the DERP. In fiscal year 2007, the Corps had 2,612 FUDS in the IRP.[2] Performance metrics and comprehensive goals have been developed by DOD to assess progress toward the agency's IRP goals. These goals include progress in reaching a CERCLA cleanup phase at the site level, progress toward achieving a "remedy in place" or "response complete" status at the installation level, and progress in achieving overall relative-risk reduction. Specific targets are included in DOD's annual report to Congress.

To better focus its munitions cleanup activities on both active sites and FUDS, DOD established the Military Munitions Response Program (MMRP) in September 2001, as part of the DERP, specifically to address potential explosive and environmental hazards associated with munitions. The objectives of the program include compiling a comprehensive inventory of military munitions sites, establishing a prioritization protocol for sequencing work at these sites, and establishing program goals and performance measures to evaluate progress. In December 2001, shortly after DOD established the program, the Congress passed the National Defense Authorization Act for fiscal year 2002, which, among other things, required DOD to develop an initial inventory of defense sites, other than military ranges still in operation, that are known or suspected to contain military munitions by May 31, 2003, and to provide annual updates thereafter. DOD provides these updates as part of its annual report to Congress on Defense environmental programs; in its 2007 report DOD had identified 3,537 sites suspected or known to have munitions contamination, an increase of 221 sites from fiscal year 2006. Table 1 provides a summary of DOD performance goals for MMRP and IRP.

[2]There are also 422 Building Demolition/Debris Removal category sites in the FUDS IRP program.

Table 1: Summary of DOD Performance Goals for MMRP and IRP

Phase/priority	Target year for completing cleanup phase for all sites	
	Installation restoration program (IRP)	Military munitions response program (MMRP)
Preliminary assessment	No goal established	2007
Site inspections	No goal established	2010
For High Priority Sites: Remedy in Place or Response Complete (RIP/RC), or cleaned up to a lower risk level	2007	No goal established
For Medium Priority Sites: RIP/RC (or cleaned up to a lower risk level)	2011	No goal established
For Low Priority Sites: RIP/RC (or cleaned up to a lower risk level)	2014 – Active 2020 – FUDS	No goal established

Source: Fiscal Year 2007 Annual Report to Congress, Department of Defense, Defense Environmental Programs.

The Spring Valley Site

The principal government entities involved in the Spring Valley cleanup include the Corps, the Environmental Protection Agency (EPA), and the District of Columbia. The Corps has led the effort of identifying, investigating, and cleaning up contamination at the site, whereas EPA primarily consulted with and provided technical assistance to the Corps and the District of Columbia. The District of Columbia's Department of Health has monitored the cleanup's status and adequacy, conducting such actions as, according to the Department, assessing the human health risks associated with any exposure to remaining hazards at Spring Valley. Additionally, advisory entities were created to further facilitate decision-making on technical topics.

In 2002, we reported that cleanup progress included the identification and removal of a large number of hazards, including buried ordnance, chemical warfare agents in glass containers, and arsenic-contaminated soil.[3] By April 2002 the Corps had identified and removed 5,623 cubic yards of arsenic-contaminated soil from 3 properties and removed 667

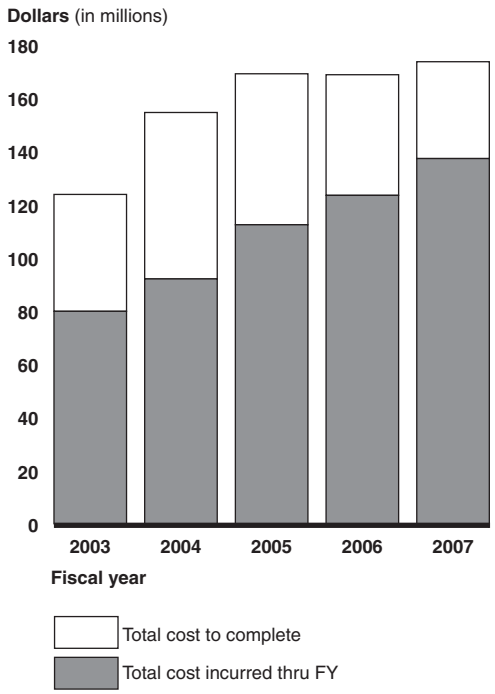
[3]GAO, *Environmental Contamination: Many Uncertainties Affect the Progress of the Spring Valley Cleanup*, GAO-02-556 (Washington D.C.: June 6, 2002).

pieces of ordnance-- 25 of which were chemical munitions-- and 101 bottles of chemicals. A March 2009 project overview report by the Corps indicated that, in 2004, the Corps excavated 474 drums of soil and recovered more than 800 items, such as construction debris, ordnance scrap, and laboratory glassware and ceramic pieces. The report also indicated that, by 2006, the Corps removed 5,500 cubic yards of soil, 117 munitions debris items, 6 intact munitions items, and 31 intact containers; in addition, the excavation, backfilling, and restoration of the debris field that contained these materials was completed.

We reported in 2002 that the primary health risks that influenced cleanup activities were (1) the possibility of injury or death from exploding or leaking ordnance and containers of chemical warfare agents; and (2) potential long-term health problems, such as cancers and other health conditions, from exposure to arsenic-contaminated soil. A study by the Department of Health and Human Services' Agency for Toxic Substances and Disease Registry found no evidence of significant exposure to arsenic in the individuals tested in 2002. In 2003, the Corps discovered perchlorate in groundwater at the site, and installed at least 38 monitoring wells for sampling. Sampling results identified elevated levels of perchlorate in the project area. Further investigation is underway with more wells and sampling planned in 2009. In April 2002, the Army estimated that the remaining cleanup activities at Spring Valley would take 5 years to complete. Total costs for the project were estimated at $145.9 million in fiscal year 2002; by fiscal year 2007, the estimated total costs increased to $173.7 million. Figure 1 presents information on the annual cost to complete[4] and annual amounts spent to date from 2003 to the present at the Spring Valley site.

[4]DOD periodically estimates the remaining costs necessary to complete restoration based on data about contamination and cleanup requirements at each site; these estimates are known as "costs to complete."

Figure 1: Total Estimated Cost to Clean Up Spring Valley, Fiscal Years 2003 through 2007



Sources: Defense Environmental Restoration Program Annual Report to Congress for Fiscal Year 2003. Defense Environmental Programs Annual Reports to Congress for Fiscal Years 2004 through 2007.

Shortcomings in the Use of Available Information and Guidance Can Lead to Poor Decision-making

When we reviewed the Spring Valley cleanup in 2002, we found that the Army determined that there was no evidence of large–scale burials of hazards remaining at Spring Valley before it received all technical input.[5] For example, while the Army's Toxic and Hazardous Materials Agency reviewed work done by American University and documentation from additional sources, it also contracted with EPA's Environmental Photographic Interpretation Center to review available aerial photographs of the site taken during the World War I era. However, the photographs were not received or reviewed prior to 1993, according to EPA officials. Despite never having received technical input from EPA on the aerial photographs, in 1986 the Army concluded that if any materials were buried in the vicinity of the university, the amounts were probably limited to

[5]GAO, *Environmental Contamination: Many Uncertainties Affect the Progress of the Spring Valley Cleanup*, GAO-02-556 (Washington D.C.: June 6, 2002).

small quantities and no further action was needed. However, as we now know, subsequent investigations by the Army discovered additional ordnance in large burial pits and widespread arsenic-contaminated soil.

The experience at Spring Valley is by no means a unique occurrence. Our review of other FUDS nationwide found significant shortcomings in the Corps' use of available information and guidance for making decisions relating to cleanup of contamination at these sites. For example, in 2002, we reported that the Corps did not have a sound basis for determining that about 1,468 of 3,840 FUDS properties—38 percent—did not need further study or cleanup action.[6] Specifically, we found

- No evidence that the Corps reviewed or obtained information that would allow it to identify all the potential hazards at these properties or that it took sufficient steps to assess the presence of potential hazards.
- That for about 74 percent of all NDAI properties, the site assessment files were incomplete—i.e., the files lacked information such as site maps or photos that would show facilities, such as ammunition storage facilities, that could indicate the presence of hazards (e.g. unexploded ordnance).
- That for about 60 percent of all NDAI properties the Corps may not have contacted all the current owners to obtain information about potential hazards present on the site.
- The Corps appeared to have overlooked or dismissed information in its possession that indicated hazards might be present. For example, at a nearly 1,900 acre site previously used as an airfield by both the Army and the Navy, the file included a map showing bomb and fuse storage units on the site that would suggest the possible presence of ordnance-related hazards; however, we found no evidence that the Corps searched for such hazards.
- The files contained no evidence that the Corps took sufficient steps to assess the presence of potential hazards. For example, although Corps guidance calls for a site visit to look for signs of potential hazards, we

[6]GAO, *Environmental Contamination: Corps Needs to Reassess Its Determinations That Many Former Defense Sites Do Not Need Cleanup*, GAO-02-658 (Washington D.C.: Aug. 23, 2002).

estimated that the Corps did not conduct the required site visit for 686 or about 18 percent of all NDAI properties.

We found that these problems occurred in part because the Corps' guidance did not specify (1) what documents or level of detail the agency should obtain when looking for information on the prior uses of and the facilities located at FUDS properties to identify potential hazards or (2) how to assess the presence of potential hazards. For example, some Corps district staff stated that there was no guidance showing the types of hazard normally found at certain types of facilities. We concluded that, since many properties may have not been properly assessed, the Corps did not know the number of additional properties that may require cleanup, the hazards that were present at those properties, the risk associated with these hazards, the length of time needed for cleanup, or the cost to clean up the properties.

To address these problems, we recommended that the Corps develop more specific guidelines and procedures for identifying and assessing potential hazards at FUDS and to use them to review NDAI files and determine which properties should be reassessed. DOD told us that it has implemented this recommendation; however, according to one major association of state regulators, problems persist in how the Corps makes NDAI determinations in many cases. In 2008, the association published a fact sheet indicating, among other things, that the evidence collected is not adequate for making determinations.[7] We will be reviewing some aspects of this decision making process as part of our ongoing work on FUDS and MMRP.

[7]*Military Munitions Response Program Preliminary Assessment/Site Investigation Fact Sheet*, a report prepared by the Association of State and Territorial Solid Waste Management Officials, (Washington, D.C.: September 2008).

Incomplete Data on Site Conditions and Emerging Contaminants Can Interfere With the Development of Accurate Cost Estimates and Schedules

At Spring Valley, the Corps' estimate of the cost to complete cleanup of the site increased by about six fold—from about $21 million to about $124 million—from fiscal year 1997 through 2001. Factors such as the future discovery of hazards made it inherently challenging for the Corps to estimate the costs for completing cleanup activities at the site. Future estimates of the cost to complete cleanup of the site also depend on assumptions about how many properties require the removal of arsenic-contaminated soil and how many properties need to be surveyed and excavated to remove possible buried hazards. As these assumptions have changed, the cost to cleanup Spring Valley has continued to rise where the most recent estimate for fiscal year 2007 is $173.7 million.

The challenges of estimating the costs of the Spring Valley cleanup are common to many FUDS, and our past work has shown that incomplete data on site conditions and emerging contaminants can interfere with the development of accurate cost and schedule estimates. For example, in 2004, we evaluated DOD's MMRP program and found several weaknesses in preliminary cost estimates for numerous sites.[8] We found that a variety of factors, including the modeling tool used to compile cost estimates, contributed to these weaknesses. Specifically, when detailed, site-specific information was not available for all sites, we found that DOD used estimates, including assumptions about the amount of acreage known or suspected of containing military munitions when preparing its cost projections. As a result, the cost estimates varied widely during the life of some cleanup projects. For example, the Corps confirmed the presence of unexploded ordnance at Camp Maxey in Texas, and in 2000, estimated cleanup costs at $45 million. In its fiscal year 2002 annual report, DOD reported that the estimated total cost had tripled and grown to $130 million, and then in June 2003, the estimate decreased to about $73 million—still 62 percent more than the original cost estimate. The main factors behind these shifting cost estimates, according to the project manager, were changes in the acreage requiring underground removal of ordnance and changes in the amount of ordnance found.

To address the challenges of estimating costs, schedules, and other aspects of munitions response, we made a number of recommendations related to various elements of DOD's comprehensive plan for identifying, assessing and cleaning up military munitions at potentially contaminated

[8]GAO, *Military Munitions: DOD Needs to Develop a Comprehensive Approach for Cleaning Up Contaminated Sites*, GAO-04-147 (Washington, D.C.: Dec. 19, 2004).

sites. In its response to our 2004 report and recommendations, DOD said that it was working on developing better cost estimates, and that the Corps would designate 84 percent of its environmental restoration budget in fiscal year 2007 for investigations and cleanup actions. According to DOD, this funding would help the Corps gather more site specific information, which in turn could be used for better determining the expected cost to complete cleanup at FUDS.

We found that these concerns are also not limited to just FUDS but also affect operational ranges as well.[9] When we reviewed the development of DOD's cost estimates for addressing potential liabilities associated with unexploded ordnance, discarded military munitions, and munitions constituents on operational ranges, we found that DOD's cost estimates for cleanup were questionable because the estimates were based on inconsistent data and invalidated assumptions.[10]

The presence of newly identified contaminants at sites needing cleanup further complicates DOD's efforts to develop reliable cost estimates. In 2004, we found that DOD does not have a comprehensive policy requiring sampling or cleanup of the more than 200 chemical contaminants associated with military munitions on operational ranges. Of these 200 contaminants, 20 are of great concern to DOD due to their widespread use and potential environmental impact—including perchlorate. According to our 2005 report, perchlorate has been found in the drinking water, groundwater, surface water, or soil in 35 states, the District of Columbia (including the Spring Valley site), and 2 commonwealths of the United States.[11] In its 2007 Annual Report to Congress, DOD indicated that new requirements to address emerging contaminants like perchlorate will drive its investments in cleanup, and require modifications in plans and programs, and adjustments to total cleanup and cost to complete estimates. However, there is limited information on the potential costs of addressing these emerging contaminants and how their cleanup may affect overall site cleanup schedules. This is partly because none of these munitions constituents are currently regulated by a federal drinking water

[9]Operational ranges are areas used to conduct research, develop and test military munitions, or train military personnel.

[10]GAO, *DOD Operational Ranges: More Reliable Cleanup Cost Estimates and a Proactive Approach to Identifying Contamination Are Needed*, GAO-04-601 (Washington D.C.: May 2004).

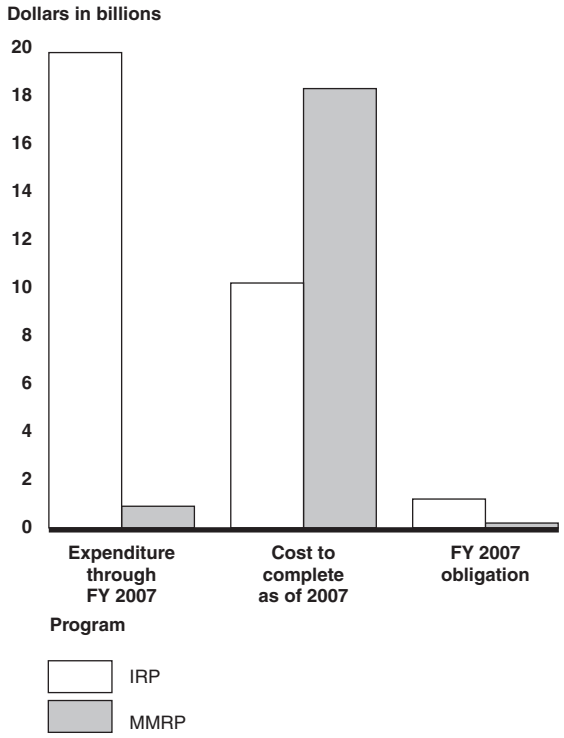
[11]GAO-04-601

standard under the Safe Drinking Water Act, although perchlorate, for example, is the subject of a federal interim health advisory and several state drinking water standards. Our 2004 report recommended that DOD provide specific funding for comprehensive sampling for perchlorate at sites where no sampling had been conducted; although DOD disagreed at the time, it recently took action to sample hundreds of locations nationwide.

Funding Available for a Particular Site May Be Influenced by Overall Program Goals and Other Priorities

Spring Valley has received priority funding due to its proximity to the nation's capitol and high visibility; however, our past work shows that this is not the case with most FUDS. Over the past 10 years DOD has invested nearly $42 billion in its environmental programs, which include compliance, restoration, natural resources conservation, and pollution prevention activities. In fiscal year 2007, DOD obligated approximately $4 billion for environmental activities, but only $1.4 billion of this total was utilized for DERP environmental restoration activities at active installations and FUDS. Of this amount, $1.2 billion funded cleanup of hazardous substances, pollutants and contaminants from past DOD activities through the Installation Restoration Program (IRP) and $215.8 million funded activities to address unexploded ordnance, discarded military munitions and munitions constituents through the Military Munitions Response Program (MMRP). Figure 2 shows expenditures through fiscal year 2007, DOD's estimated costs to complete, and the fiscal year 2007 obligations for the IRP and MMRP at active sites and FUDS.

Figure 2: Funding Summary for IRP and MMRP Programs



Source: Defense Environmental Programs Annual Report to Congress for Fiscal Year 2007.

DOD requests separate funding amounts for active sites and FUDS cleanup programs based on specific DERP restoration goals and the total number of sites in each program's inventory. Goals are set separately for the IRP and MMRP; target dates for cleanup of high priority sites are different for these programs. Furthermore, while DOD has established Department-wide goals, each service has its own goals, which may differ, and determines the allocation of funds between IRP and MMRP. Specifically, for the IRP, the DOD goal is to have a remedy in place or response complete for all active sites and FUDS by fiscal year 2020. However, DOD has requested much greater budgets for active sites than for FUDS. For example, DOD requested $257.8 million for FUDS or only one-fifth of the amount requested for active sites for fiscal year 2009. Similarly, obligations in fiscal year 2007 totaled $969.8 million for active sites, whereas FUDS obligations only totaled $219.4 million. According to the most recent annual report to Congress, DOD does not expect to complete the IRP goal for FUDS until fiscal year 2060. DOD is aiming to complete cleanup of IRP sites much earlier than MMRP sites, even if higher-risk MMRP sites have not yet been addressed.

For MMRP, DOD's first goal was to complete preliminary assessments for FUDS as well as active sites, by the end of fiscal year 2007.[12] DOD reported that it has reached this goal for 96 percent of MMRP sites. However, it is not clear if this percentage includes sites recently added to the site inventory. DOD also has an MMRP goal of completing all site inspections by the end of fiscal year 2010, but has not yet set a goal for achieving remedy in place or response complete. Our ongoing reviews of the FUDS and MMRP programs will include more in-depth analyses of the prioritization processes used by DOD for active sites and FUDS.

Better Coordination and Communication with Regulators and Property Owners Can Increase Public Confidence and Facilitate Effective Decision-making

In our 2002 report on Spring Valley, we reported that the Corps, EPA and the District of Columbia had made progress on site cleanup by adopting a partnership approach for making cleanup decisions.[13] Importantly, they established a systematic means of communicating information to, and receiving input from, the residents of Spring Valley and other interested members of the public. While the entities did not agree on all cleanup decisions, officials of all three entities—the Corps, the District of Columbia, and EPA—stated that the partnership had been working effectively. However, we have found that this kind of cooperation and coordination does not always occur at other sites nationwide. For example:

- In 2003, we conducted a survey to determine how the Corps coordinates with state regulators during the assessment and cleanup of FUDS. We found that the Corps did not involve the states consistently, and that EPA had little involvement in the cleanup of most FUDS.[14] We found that the Corps informed states of upcoming work at hazardous waste projects 53 percent of the time and requested states' input and participation 50 percent of the time. We reported that federal and state regulators believed

[12]The John Warner National Defense Authorization Act for Fiscal Year 2007 required the Secretary of Defense to set four goals for the MMRP: (1) to complete preliminary assessments for active sites, other than operational ranges, and FUDS by September 30, 2007; (2) to complete site assessments at such sites by September 30, 2010; (3) to achieve remedy in place or response complete at pre-2005 BRAC sites by September 30, 2009; and (4) to achieve remedy in place or response complete at active sites, FUDS, and 2005 BRAC sites by a date to be established by the Secretary.

[13]GAO, *Environmental Contamination: Many Uncertainties Affect the Progress of the Spring Valley Cleanup*, GAO-02-556 (Washington D.C.: June 6, 2002).

[14]GAO, *Environmental Protection: DOD Has Taken Steps to Improve Cleanup Coordination at Former Defense Sites but Clearer Guidance Is Needed to Ensure Consistency*, GAO-03-146, (Washington, D.C.: March 2003).

that better coordination with the Corps regarding cleanup at FUDS would increase public confidence in the cleanups and improve their effectiveness.

- Some state regulators told us that inadequate Corps coordination has made it more difficult for them to carry out their regulatory responsibilities at FUDS properties and that, because of their lack of involvement, they have frequently questioned Corps cleanup decisions at FUDS. Conversely, when Corps coordination has occurred, states have been more likely to agree with Corps decisions. Several states also told us that they would like to see EPA become more involved in the cleanup process, for example, by participating in preliminary assessments of eligibility or providing states with funds to review Corps work. EPA also believed that a better-coordinated effort among all parties would improve the effectiveness of cleanup at FUDS and increase public confidence in the actions taken at these sites, but emphasized it did not expect its involvement to be consistent across all phases of work; rather, that it would increase its involvement at a site when conditions warranted—for example, if there were "imminent and substantial endangerment" or if it had concerns about the appropriateness of the cleanup.

We also found that EPA and DOD disagreed on EPA's role in the FUDS program. Although EPA is the primary regulator for the FUDS that are on the National Priorities List, the states are typically the primary regulatory agency involved for all other FUDS. EPA told us that its role at some of these unlisted FUDS should be greater because it believes it can help improve the effectiveness of the cleanups and increase public confidence in the program. DOD and some states disagreed with this position because they do not believe there is a need for additional EPA oversight of DOD's work at unlisted FUDS properties where the state is the lead regulator. We concluded in 2003 that the lack of a good working relationship between two federal cleanup agencies may hamper efforts to properly assess properties for cleanup and may, in some cases, result in some duplication of effort.

We also concluded in this 2003 report that a factor behind the historical lack of consistency in the Corps coordination with regulators could be that DOD and Corps guidance does not offer specific requirements that describe exactly how the Corps should involve regulators. To address these shortcomings, we recommended that DOD and the Corps develop clear and specific guidance that explicitly includes, among other things, what coordination should take place during preliminary assessments of eligibility on projects involving ordnance and explosive waste. We also

recommended that DOD and the Corps assess recent efforts to improve coordination at the national as well as district level and promote wider distribution of best practices; and work with EPA to clarify their respective roles in the cleanup of former defense sites that are not on the National Priorities List. DOD, representing the Corps and DOD, generally agreed with our recommendations and has since implemented additional changes to improve its coordination with regulators, including revising its guidance to include step-by-step procedures for regulatory coordination at each phase of FUDS cleanup. However, we have not reassessed DOD's efforts or reviewed its coordination efforts since our 2003 report.

In addition to better coordination with regulators, our past work has shown that the Corps frequently did not notify property owners of its determinations that the properties did not need further action, as called for in its guidance, or instruct the owners to contact the Corps if evidence of DOD-caused hazards was found later. In 2002, we estimated that the Corps failed to notify current owners of its determinations for about 72 percent of the properties that the Corps determined did not need further study or cleanup action.[15] Even when the Corps notified the owners of its determinations, we estimated that for 91 percent of these properties it did not instruct the owners to contact the Corps if evidence of potential hazards was found later. In some cases, several years elapsed before the Corps notified owners of its determinations. We concluded that this lack of communication with property owners hindered the Corps' ability to reconsider, when appropriate, its determinations that no further study or cleanup action was necessary.

As a result of our findings, we recommended that the Corps consistently implement procedures to ensure that owners are notified of NDAI determinations and its policy of reconsidering its determinations if evidence of DOD-caused hazards is found later. DOD has implemented this recommendation although we have not reviewed its implementation.

In conclusion, Mr. Chairman, as we move forward on the cleanup of the Spring Valley site, we believe that the lessons learned from DOD's national environmental cleanup programs provides valuable insights that could

[15]GAO, *Environmental Contamination: Corps Needs to Reassess Its Determinations That Many Former Defense Sites Do Not Need Cleanup*, GAO-02-658, (Washington, D.C.: Aug. 23, 2002).

guide decision-making and also inform the oversight process. The experience at the national level tells us that while not all the information that DOD needs is always available, it is imperative that the information that is available should be duly considered when developing cleanup plans and estimates. Moreover, involving regulators and property owners can also better ensure that DOD has the best information on which to make its decisions. Finally, it is important to recognize that emerging and unexpected situations can cause significant changes in both cost and time schedules and this could have funding implications as well for specific cleanup sites.

This concludes my prepared statement. I will be happy to respond to any questions from you or other Members of the Subcommittee.

Contact and Staff Acknowledgments

Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this statement. For further information about this testimony, please contact Anu Mittal at (202) 512-3841 or mittala@gao.gov. Key contributors to this testimony were Diane Raynes, Elizabeth Beardsley, Alison O'Neill, Justin Mausel, and Amanda Leisoo.

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