

November 2007

HAZARDOUS WASTE

Information on How DOD and Federal and State Regulators Oversee the Off-Site Disposal of Waste from DOD Installations





Highlights of [GAO-08-74](#), a report to congressional requesters

Why GAO Did This Study

Military installations operated by the Department of Defense (DOD) can generate hazardous waste during routine operations, such as the repair and maintenance of weapon systems and equipment, or during an environmental cleanup related to past operations. The proper disposal of hazardous waste, especially when it is taken to an off-site location, is essential to ensuring the health and safety of communities across the country. This report describes (1) DOD's procedures for selecting hazardous waste transporters and treatment, storage, and disposal facilities, and ensuring that they properly dispose of hazardous waste; (2) the role of the Environmental Protection Agency (EPA) and state agencies in ensuring hazardous waste is disposed of safely and in accordance with laws and regulations; and (3) the information that facilities and regulators must publicly report regarding a release of hazardous waste and the enforcement actions taken against facilities found in violation of the applicable laws and regulations. GAO reviewed applicable laws, regulations, and policies, and interviewed federal and state officials.

GAO does not make any recommendations in this report. EPA generally agreed with the report, while DOD did not comment on the report. Both agencies provided technical comments which were incorporated.

To view the full product, including the scope and methodology, click on [GAO-08-74](#). For more information, contact Anu K. Mittal at (202) 512-3841 or mittala@gao.gov.

HAZARDOUS WASTE

Information on How DOD and Federal and State Regulators Oversee the Off-Site Disposal of Waste from DOD Installations

What GAO Found

DOD primarily relies on private contractors to handle the off-site disposal of hazardous waste generated by its installations and has procedures aimed at ensuring that its contractors select appropriate transporters and treatment, storage, and disposal facilities. The procedures that DOD follows regarding the disposal of hazardous waste depend on whether the waste was generated from routine operations or from an environmental cleanup. For routine operations, DOD's preferred process is for installations to rely on regional contracts awarded to private firms by DOD's Defense Reutilization and Marketing Service to manage the disposal process. These private firms must select hazardous waste transporters and treatment, storage, and disposal facilities from a DOD approved list. Similarly, for environmental cleanups, DOD relies on contractors to manage the cleanup projects. However, unlike routine cleanups, these contractors do not have an approved list from which they can choose. Instead they are required to choose transporters and facilities, with DOD oversight, that are to comply with the requirements of environmental laws, such as having the appropriate permits. DOD is not required by the Resource Conservation and Recovery Act (RCRA) to oversee the physical operations of permitted facilities. That oversight is conducted by EPA and authorized state agencies that have overall responsibility for enforcing requirements designed to ensure these facilities dispose of hazardous waste properly.

EPA or authorized state agencies issue permits required under RCRA to hazardous waste disposal facilities and monitor the facilities' performance to ensure that these facilities dispose of hazardous waste safely and in accordance with laws and regulations. To ensure that treatment, storage, and disposal facilities comply with their permits and other RCRA requirements, EPA or the authorized state agency are required to inspect the facility every 2 years. If a violation is found, legal action, in the form of an administrative order, a civil lawsuit, or a criminal lawsuit, may follow, depending upon the nature and severity of the problem.

Certain federal laws, including RCRA, require facilities and regulators to report some information to the public regarding hazardous waste releases and enforcement actions against hazardous treatment, storage, and disposal facilities. For hazardous waste releases, both EPA and the facilities must report various types of information depending on the hazardous waste involved, the amount released, and the type of facility, among other things. For example, facility owners must report the accidental release of a broad range of hazardous substances to local emergency responders. For enforcement actions taken against the facilities, EPA and authorized state agencies have few requirements for reporting information publicly, but may provide some information about the violation and any penalty imposed.

Contents

Letter		1
	Results in Brief	3
	Background	5
	DOD Contractors Must Select Facilities That Are Approved to Treat, Store, and Dispose of Hazardous Waste, and DOD Relies on Other Regulatory Agencies to Ensure That Waste is Disposed of Properly	8
	EPA and Authorized State Agencies Are Responsible for Approving Permits for Hazardous Waste Facilities and Monitoring Their Performance	17
	EPA and Facility Owners Provide Limited Public Information on Hazardous Waste Releases and Enforcement Actions Taken	23
	Agency Comments and Our Evaluation	24
Appendix I	Off-Site Disposal of DOD Hazardous Waste from an Evaporation Pond at DOD’s Rocky Mountain Arsenal	26
Appendix II	Recycling Activities at Encycle and Asarco’s El Paso Smelter and EPA’s Enforcement Action	30
Appendix III	Comments from the Environmental Protection Agency	37
Appendix IV	GAO Contact and Staff Acknowledgments	38
Figures		
	Figure 1: Rocky Mountain Arsenal’s Process for Selecting the Off-Site Disposal Facility for Hazardous Waste from Basin F	14
	Figure 2: Process Followed by the Army’s Rocky Mountain Arsenal for Ensuring the Treatment, Storage, and Disposal Facility Properly Disposed of Waste from Basin F	17
	Figure 3: Encycle Hazardous Waste Permit and RCRA Inspection Information	20

Figure 4: Civil Judicial Enforcement Action and Consent Decree Between EPA, Texas, and Asarco	22
Figure 5: Information Provided to the Public by the Department of Justice, EPA, and Texas in a Press Release Regarding the Enforcement Action Against Asarco	24

Abbreviations

Asarco	ASARCO
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DOD	Department of Defense
DRMS	Defense Reutilization and Marketing Service
EPA	Environmental Protection Agency
RCRA	Resource Conservation and Recovery Act
Shell	Shell Oil Company

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United States Government Accountability Office
Washington, DC 20548

November 13, 2007

The Honorable Solomon P. Ortiz
Chairman
Subcommittee on Readiness
Committee on Armed Services
House of Representatives

The Honorable Silvestre Reyes
House of Representatives

The proper disposal of hazardous waste—harmful liquids, solids, contained gases, or sludges—is essential to ensuring the health and safety of communities across the United States. In accordance with various environmental protection laws and Department of Defense (DOD) policy, DOD installations must properly dispose of hazardous waste that they generate (1) at active installations during routine operations or from past operations, (2) at installations being closed, or (3) at properties formerly owned or controlled by the department. For example, in calendar year 2005, at active installations, DOD disposed of 132 million pounds of hazardous waste from routine operations alone. DOD disposes of some hazardous waste at privately operated treatment, storage, and disposal facilities. If facility operators dispose of this waste improperly, it can contaminate the environment or threaten human health. Further, DOD can be held liable for the cost of cleaning up waste improperly disposed of by its contractors. For example, at a disposal site in South Carolina where DOD sent waste in the 1980's, DOD had to pay approximately \$5 million to help clean soil and groundwater contamination because the contaminated site had been abandoned by its owners.

DOD's disposal of hazardous waste is subject to several environmental statutes, including the Resource Conservation and Recovery Act (RCRA), which regulates the management of hazardous waste from generation of the waste to its disposal. Under RCRA, DOD may only send hazardous waste to facilities that are approved by federal or state regulatory agencies to treat, store, and dispose of hazardous waste. DOD must, through a hazardous waste manifest tracking system, ensure that all such hazardous waste arrives at the approved facility. The Environmental Protection Agency (EPA) is the federal agency responsible for developing RCRA regulations, guidance, and policy. EPA has generally authorized states to implement hazardous waste management programs consistent with RCRA,

but retains broad oversight over the states' regulatory programs. Currently, EPA has authorized 48 states to implement programs that must be at least equivalent to and consistent with RCRA requirements.¹

For hazardous waste generated during routine operations, the commander of the DOD installation where the waste was generated is in charge of disposing of it and complying with environmental statutes. Installation commanders are also responsible for identifying, investigating, and disposing of hazardous waste generated during past operations on active installations that are being cleaned up, and ensuring these cleanup activities comply with environmental statutes. The U.S. Army Corps of Engineers is in charge of arranging for the disposal of hazardous wastes generated during past operations on properties DOD formerly owned or controlled and ensuring these cleanup activities comply with environmental statutes.

You asked us to describe (1) DOD's procedures for selecting appropriate hazardous waste transporters and treatment, storage, and disposal facilities, and ensuring that these facilities properly dispose of hazardous waste; (2) the role of EPA and state environmental agencies in ensuring that hazardous waste is disposed of safely and in accordance with laws and regulations; and (3) the information that facilities and regulators must report to the public regarding a release of hazardous waste and the enforcement actions taken against facilities that are found to be in violation of the applicable laws and regulation. In this context, you also asked us to specifically describe how these procedures were followed in the case of hazardous waste generated at DOD's Rocky Mountain Arsenal and disposed of by a treatment, storage, and disposal facility in Texas from 1993 to 1995.

To identify DOD's procedures for disposing of hazardous waste, we reviewed applicable laws, regulations, and policies, as well as the procedures of the Defense Environmental Restoration Program, the Defense Logistics Agency's Defense Reutilization and Marketing Service (DRMS), the Army Corps of Engineers, and the Departments of the Army, Navy, and Air Force. We also interviewed officials within these organizations, as well as within DOD. To describe the role of EPA and authorized state agencies in ensuring that hazardous waste is disposed of properly and the information regulators and treatment, storage, and

¹Alaska and Iowa are not currently authorized to implement RCRA.

disposal facility owners or operators must report to the public regarding releases of hazardous waste at these facilities, we reviewed the applicable statutes and regulations. We interviewed officials in EPA headquarters, EPA Region 6, and the Texas Commission on Environmental Quality. We also interviewed officials from ASARCO (Asarco), a company that had a treatment, storage, and disposal facility permitted to operate in Texas until 2003. We performed our work between March 2007 and October 2007, in accordance with generally accepted government auditing standards.

Results in Brief

DOD primarily relies on private contractors to handle the off-site disposal of hazardous waste generated by its installations. While DOD has procedures aimed at ensuring that its contractors select appropriate transporters and treatment, storage, and disposal facilities for the waste generated at installations, it relies on federal and state environmental regulators to ensure that this hazardous waste is disposed of properly. The procedures that DOD follows regarding the disposal of hazardous waste are dependent on whether the waste was generated from routine operations or is from an environmental cleanup. Specifically,

- To dispose of hazardous waste generated during routine operations, DOD's preferred process is for installations to rely on DRMS. To arrange for the removal and disposal of hazardous waste from installations, DRMS awards regional contracts to private firms who manage the disposal process and requires these contractors to use hazardous waste transporters and treatment, storage, and disposal facilities that have been approved by DRMS. To be approved by DRMS, transporters and facilities must meet certain criteria, such as having current environmental permits and a history of compliance with environmental laws, such as RCRA. DRMS reviews a limited number of approved hazardous waste transporters and facilities annually to ensure that they still meet the agency's criteria. Alternately, installation commanders can choose to obtain disposal contractors on their own, instead of using DRMS contractors. However, commanders must first obtain approval from their chain of command and must follow processes similar to DRMS to ensure that they are complying with all applicable legal and regulatory requirements.
- During environmental cleanups to dispose of hazardous waste generated during past operations at active installations, DOD directly hires private contractors to manage the cleanup projects. These contractors select the transporters and the facilities that will treat, store, and dispose of the hazardous waste from DOD's installations, with DOD oversight. While DOD does not have an approved list of facilities that these contractors

must select from, contractors must consult with EPA regional offices to determine whether a facility is acceptable for receiving cleanup waste. DOD requires the firms it contracts with to comply with environmental laws, including requiring the contractors to use only those disposal facilities with the appropriate permits. For hazardous waste that must be disposed of as a result of cleanup at properties that DOD formerly owned or controlled, the Army Corps of Engineers also hires contractors to manage the cleanup projects and requires them to use disposal facilities with appropriate permits.

RCRA regulations do not require DOD to oversee the physical operations of permitted facilities. That oversight is conducted by EPA and authorized state agencies that have overall responsibility for enforcing requirements designed to ensure these facilities dispose of hazardous waste properly. As required by RCRA, DOD uses a tracking system to ensure that hazardous waste shipped off site arrives at the permitted hazardous waste facility designated to receive the waste. Once the waste reaches the hazardous waste disposal facility, DOD is not required by law to ensure that the waste is disposed of properly. Instead DOD relies on the monitoring and oversight conducted by EPA and authorized state agencies that have overall responsibility for ensuring that these facilities dispose of hazardous waste properly. DOD has procedures to help ensure that the facility disposes of hazardous waste properly for certain types of hazardous waste disposal contracts involving the Army Corps of Engineers. For cleanups the Army Corps of Engineers conducts, the agency has issued guidance recommending that contracting officials should request a certificate documenting the disposal for all items the facilities are asked to dispose of at their locations, including hazardous waste.

EPA and authorized state agencies issue permits required under RCRA to hazardous waste disposal facilities and monitor the facilities' performance to ensure that these facilities dispose of hazardous waste safely and in accordance with laws and regulations. Specifically, permits provide facility owners and operators with the legal authority to treat, store, or dispose of hazardous waste and include details about how the facility must comply with the regulations. The permit also outlines facility design, construction, and operation; lays out safety standards; and describes activities that the facility must perform to comply with regulations, such as monitoring and reporting. Compliance with the permit ensures hazardous waste is handled in a controlled manner that is protective of human health and the environment. To ensure that facilities comply with their permits and other RCRA regulatory requirements, EPA or the authorized state

agency are required to inspect the facility at least once every 2 years. If a violation is found, legal action, in the form of an administrative order, a civil lawsuit, or a criminal lawsuit, may follow, depending on the nature and severity of the problem.

Certain federal laws, including RCRA and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), require facilities and regulators to report some information to the public regarding hazardous waste releases and enforcement actions against hazardous waste treatment, storage, and disposal facilities. Specifically, for hazardous waste releases, both EPA and the facilities must report various types of information depending on the hazardous waste involved, the amount released, and the type of facility, among other things. For example, facility owners must immediately report the accidental release of a broad range of hazardous substances to local emergency responders if a release exceeds regulatory thresholds. In addition, certain facilities that manufacture, process, or otherwise use any of 581 individual chemicals and 30 chemical categories must report the amount of those chemicals that they released into air, soil, or water annually to EPA and their respective state. EPA is required to make this information available to the public and maintains summary information about facilities' toxic releases on its Web site. When enforcement actions are taken against the facilities, EPA and authorized state agencies have few requirements for reporting information publicly but may provide some information about the violation and any penalty imposed. For cases involving alleged discharges of pollutants, the Department of Justice must generally provide public notice of and an opportunity to comment on proposed settlements at least 30 days before the judgment is entered by the court. In addition, EPA maintains a Web site that provides the environmental compliance history of regulated facilities and includes reports on inspections, violations, and enforcement actions for each facility for the most recent 5 year period. EPA may also publicly share information about enforcement actions against treatment, storage, and disposal facilities via press releases. However, there are no criteria for determining which enforcement actions warrant press releases; EPA decides whether to issue press releases on a case by case basis.

Background

Hazardous waste, if disposed of improperly, can be dangerous to the environment and human health because it can pollute ground and surface waters, contaminate soil, and be released into the atmosphere. Hazardous

wastes are discarded material and may be in a variety of forms, including solids, liquids, sludge, or contained gases. Waste is hazardous under RCRA if it is ignitable, corrosive, reactive, or toxic or if it appears on a list of about 100 common industrial and manufacturing waste streams. Ignitable wastes catch fire easily. Corrosive wastes readily corrode or dissolve flesh, metal, or other materials. Reactive wastes may react spontaneously or vigorously with air or water, be unstable to shock or heat, generate toxic gases, or be readily capable of exploding. Toxic wastes contain specified compounds and elements in levels sufficient to threaten human health and the environment.²

Military installations operated by DOD generate hazardous waste primarily through industrial processes that are used to repair and maintain weapon systems and equipment, such as aircraft, ships, or trucks. Other operations that can generate hazardous waste are frequently found at DOD installations, including vehicle motor pools, paint shops, fire departments, hospitals and medical clinics, and laundries. Hazardous waste is often a by-product of activities such as cleaning, degreasing, stripping, painting, or metal plating. Hazardous waste is also present from past activities at military installations and formerly used defense sites. Contaminants found at military installations include solvents and corrosives; fuels; paint strippers and thinners; metals, such as lead, cadmium, and chromium; and unique military substances, such as nerve agents and unexploded ordnance.

DOD is subject to various environmental laws and regulations that govern the cleanup of contamination from past operations and the control of hazardous waste related to ongoing operations including RCRA and CERCLA. Under CERCLA, the federal government is authorized to respond to spills and releases (or threatened releases) of hazardous substances and to clean up those sites. Amendments to CERCLA required DOD to establish the Defense Environmental Restoration Program to address the cleanup of hazardous waste and other contaminants that pose environmental health and safety risks at DOD installations.

RCRA, among other requirements, established regulatory controls over the generation, transportation, and disposal of the hazardous waste materials. These controls include permit requirements for hazardous waste

²Hazardous waste listings and descriptions of the characteristics appear at 40 C.F.R. Part 261.

treatment, storage, and disposal facilities and a manifest system to track waste from points of generation to final disposal sites. RCRA establishes a cradle-to-grave management system for hazardous waste from generation to final treatment, storage, or disposal. Generators of hazardous waste must comply with regulations concerning record keeping and reporting, labeling of waste, use of appropriate containers, information on the waste's general chemical composition, and use of a hazardous waste tracking manifest system. Transporters of hazardous waste must comply with transportation safety regulations and use the hazardous waste manifest system to monitor waste from its point of generation, along its transportation routes, and to its final treatment, storage, or disposal site.³ Treatment, storage, and disposal facilities are required to have permits, to comply with strict operating standards, to meet financial requirements, and to comply with strict requirements when closing their facilities.

EPA has the responsibility, in partnership with the states, for regulating the management of hazardous waste and monitoring compliance under RCRA. However, EPA can authorize state hazardous waste programs to operate and implement hazardous waste requirements as long as the state programs are at least equivalent to the federal program and provide for adequate enforcement. Using this authority, EPA has authorized most states to carry out their own programs for permitting, inspecting, and regulating hazardous waste.

EPA expects its 10 regional offices to take a systematic, consistent approach in overseeing the state authorized programs. EPA regional offices conduct oversight and provide states with guidance, training, and technical assistance to ensure consistent performance of state programs. If EPA finds an authorized state not adequately administering or enforcing authorized programs, EPA may provide additional technical assistance, condition the receipt of grant funds on compliance with EPA guidance, or withdraw state authorization.⁴ In addition, EPA can independently take federal enforcement action against a violator.

³Regulations governing the hazardous waste manifest system appear at 40 C.F.R Part 262.

⁴EPA officials informed GAO that the agency has never withdrawn a state's authorization.

DOD Contractors Must Select Facilities That Are Approved to Treat, Store, and Dispose of Hazardous Waste, and DOD Relies on Other Regulatory Agencies to Ensure That Waste is Disposed of Properly

DOD has procedures for ensuring that its contractors select appropriate transporters and treatment, storage, and disposal facilities for hazardous waste, and it relies on environmental regulators to ensure that these facilities dispose of hazardous waste properly. DOD's procedures for the off-site disposal of hazardous waste vary depending upon whether the waste was generated during routine operations or is from an environmental cleanup. In either case, DOD's system for monitoring off-site disposal of hazardous waste is limited to tracking waste shipments to see that they arrive at their intended destination. RCRA regulations do not require DOD to oversee the physical operations of permitted facilities. That oversight is conducted by EPA and authorized state agencies that have overall responsibility for enforcing requirements designed to ensure these facilities dispose of hazardous waste properly.

DOD Has Specific Procedures That Apply to the Off-Site Disposal of Hazardous Waste from Routine Operations and Environmental Cleanups

DOD's procedures for the off-site disposal of hazardous waste vary depending on whether the waste was generated during routine operations or is from an environmental cleanup. For hazardous waste generated during routine operations, DOD prefers that installation commanders use DRMS to manage the disposal of waste off site. For waste generated during past operations at active installations and formerly used defense sites that are subject to environmental cleanups, DOD policy requires installations and the Army Corps of Engineers to follow the cleanup process outlined in CERCLA. DOD hires contractors to manage the cleanup projects.

Procedures for Off-Site Disposal of Hazardous Waste Generated during Routine Operations

For off-site disposal of waste generated during routine operations, DOD policy establishes that its preferred process is for installation commanders to rely on DRMS to manage the disposal.⁵ Under this process, DRMS contracting officials in their Battle Creek, Michigan, headquarters solicit and award regional service contracts to companies that will manage the pick up and disposal of most hazardous waste for specific geographic areas. As of September 2007, DRMS had 55 regional service contracts for hazardous waste disposal. The contracts contain estimated quantities of

⁵DOD 4160.21-M, *Defense Materiel Disposition Manual*, (Washington, D.C., Aug. 18, 1997), sets forth DOD policy and prescribes uniform procedures for the disposition of DOD personal property, including hazardous waste. DOD instruction 4715.4, *Pollution Prevention*, contains general hazardous waste policy.

various waste and related management services that might be needed by the DOD installations. After award, the selected contractor will pick up waste from DOD installations and conduct other disposal services for the duration of the contract period via individual task orders that are issued against the contract. According to DRMS, most contracts are for 18 months with options to extend them.

DRMS's process for awarding the regional service contracts is based more on past performance rather than price.⁶ This process allows DRMS to accept other than the lowest priced proposal if, for example, the offeror's past performance record leads DRMS to believe that the contractor will provide better quality disposal services. DRMS contracting officers review the offeror's past performance based on several factors including (1) how well the offeror conformed to specifications and to standards of good workmanship; (2) the offeror's adherence to contract schedules, including the administrative aspects of performance; (3) the offeror's history of reasonable and cooperative behavior and commitment to customer satisfaction; (4) the offeror's businesslike concern for the interests of the customer; and (5) the offeror's performance on the same or similar contracts in terms of complexities of the services provided (e.g., disposing of comparable quantities and similar types of waste). While considering the offeror, DRMS may conduct a review of the offeror's technical capacity to manage the waste, obtain financial reviews of the company, and have environmental experts conduct site visits at the offeror's location.⁷ DRMS may also obtain information from other sources, including past and present customers and their employees; other government agencies, including state and local agencies; consumer protection organizations and better business bureaus; former subcontractors; and others who may have useful information.

⁶DRMS must follow Federal Acquisition Regulation and Defense Federal Acquisition Regulation Supplement rules in collecting past performance information. According to the Federal Acquisition Regulation Part 15, "Contracting by Negotiation," an agency can obtain best value in negotiated procurements by using any one or a combination of source selection processes. In different types of procurements, the relative importance of cost or price may vary. For example, in procurements where the requirement is not easily defined or the risk of unsuccessful contract performance is relatively high, technical capability and other factors such as past performance considerations may play a dominant role.

⁷DRMS obtains financial reviews from the Defense Contract Management Agency, another agency within DOD.

According to DRMS officials, once selected, most of the regional service contractors subcontract with transporters and treatment, storage, and disposal facilities to dispose of the DOD hazardous waste. DRMS requires regional service contractors to select subcontractors from a list of transporters and treatment, storage, and disposal facilities that DRMS has approved.⁸ As of September 2007, DRMS listed 125 approved companies to transport waste and 152 approved facilities to treat, store, or dispose of hazardous waste.⁹ According to DRMS officials, a treatment, storage, and disposal facility is approved when DRMS (1) ensures that the facility is permitted by federal or state agencies to dispose of this kind of waste, (2) confirms that the facility is in compliance with environmental laws, (3) validates the type of waste the facility can receive, and (4) approves the facility's treatment methods. DRMS takes similar steps when considering transporters.

After the initial approval, DRMS has additional processes to ensure the treatment, storage, and disposal facilities remain on the approved list. For example, DRMS officials conduct desk audits that include verifying a facility's permit and reviewing a facility's compliance with environmental laws. According to DRMS officials, the goal is to conduct a review of treatment, storage, and disposal facilities every year, however, the number they review each year varies based on available funds. DRMS prioritizes the facilities to review based on the volume and type of waste facilities handle and their compliance status. In addition, DRMS hires contractors to conduct site visits at some facilities on its approved list to determine if the facility is disposing of waste properly. Since fiscal year 2004, DRMS has typically visited fewer than 20 facilities on its approved list each year. Also, DRMS began conducting desk reviews of transporters in fiscal year 2007. Desk reviews for transporters include verifying a transporter's permit and compliance with applicable laws.

While the use of DRMS services is the preferred method of hazardous waste disposal, DOD policy allows installation commanders to use other contractual arrangements for hazardous waste disposal if they obtain

⁸Some large companies may have transporters and treatment, storage, and disposal facilities within their company. In these cases, these transporters and treatment, storage, and disposal facilities must be on the approved list also. Contractors may ask DRMS to add hazardous waste facilities or transporters to its list. The contractor must submit required information and DRMS will evaluate them.

⁹There are 274 facilities on the approved list but only 152 facilities are permitted for hazardous waste.

approval by their chain of command. According to DOD hazardous waste officials, installation commanders may explore obtaining other contractors for hazardous waste disposal if DRMS cannot meet their mission needs. For example, some installations may choose a local contractor that can dispose of the waste faster or at a lower cost than one of DRMS's regional contractors. However, according to hazardous waste officials within the military services, the majority of hazardous waste disposed off site generally occurs through DRMS rather than through other contractors obtained by installation commanders.

Installation commanders who obtain other disposal contractors must ensure the contract provisions comply with the Federal Acquisition Regulation and federal, state, and local safety, environmental, and transportation regulations. DOD policy also requires the installation commanders to use contract award and administration practices at least as stringent as those of DRMS including (1) conducting extensive past performance and technical evaluations of the prime contractor and subcontractors prior to awarding the contract; (2) monitoring the contractor's performance; (3) conducting on-site postaward inspections of selected facilities and transporters to ensure compliance with statutory and regulatory requirements, such as RCRA; and (4) evaluating the contractor's performance and documenting both its current and past performance history in a database.

According to hazardous waste representatives within each military service, installation commanders use contracting officials within each service to solicit and award these contracts with the assistance of each service's environmental experts. These hazardous waste representatives told us that installation officials consult the DRMS list of approved transporters and treatment, storage, and disposal facilities when selecting contractors, but they are not restricted to the facilities on DRMS's approved list. Because each installation independently implements the required contract award and administration practices, the DOD hazardous waste managers could not summarize the procedures these installations follow to implement the requirements or the extent to which the requirements are followed. However, officials told us that the services conduct reviews of their environmental programs to ensure compliance with environmental laws and DOD policy. For example, DOD requires the

Procedures for Hazardous
Waste Disposed Off-Site As a
Result of Environmental
Cleanups

installation commanders to conduct annual self-audits and have an external party audit every 3 years.¹⁰

To clean up potentially contaminated sites on both active installations and formerly used defense sites, Congress created the Defense Environmental Restoration Program which requires DOD to carry out its cleanup program subject to and consistent with CERCLA for all cleanup sites in the program.¹¹ Under CERCLA, the off-site transport and disposal of hazardous waste without treatment is the least favored cleanup alternative.¹² However, in some situations, a cleanup may involve hazardous waste that cannot be treated or disposed of at the cleanup site.

Regardless of whether the waste is treated on or off site, DOD must follow the same general CERCLA cleanup process. Once DOD determines that cleanup is necessary, it studies alternative remedies to address the contamination. DOD selects a preferred method for cleanup in coordination with EPA or state environmental regulators, and presents the proposed cleanup plan to the public for comment. After a review of public comments, DOD documents the selected remedy to address the contamination in a document called the Record of Decision or a decision document. If necessary, this document would explain if the waste must be treated and disposed of off site. However, the documents that are reviewed by regulators and the public would not typically list the specific name of the facility that would be treating and disposing of the waste.

Once DOD selects a remedy, they begin the cleanup phase. DOD typically hires a contractor to prepare and implement the cleanup plan. If the cleanup involves the transfer of waste off site, DOD and its contractor's actions must be consistent with CERCLA and EPA's implementing regulations governing cleanups that involve off-site waste transfers.¹³

¹⁰DOD instruction 4715.6, *Environmental Compliance*, requires the military services to conduct internal and external compliance self-assessments at installations.

¹¹When we refer to active installations, we are including Base Realignment and Closure properties.

¹²42 U.S.C. § 9621(b).

¹³These requirements include: (1) the off-site facility must be in compliance with applicable laws (e.g., RCRA and the Toxic Substance Control Act); (2) any off-site land disposal unit that will receive the CERCLA waste must not be releasing hazardous wastes; and (3) any releases from other units at the off-site land disposal facility are being controlled. 42 U.S.C. § 9621(d)(3); 40 C.F.R. § 300.440.

Under these regulations, EPA determines the acceptability of treatment, storage, and disposal facilities. The cleanup contractor generally selects the transporter and treatment, storage, and disposal facility that will receive hazardous waste, with the oversight of DOD. The cleanup contractor is required to subcontract disposal work only to facilities that have the appropriate permits and a positive compliance history. The contractor is also required to consult with EPA regarding the facility's compliance history and whether EPA has deemed the treatment, storage, or disposal facility acceptable for receiving hazardous waste from a CERCLA cleanup. While the primary CERCLA documents would not document the hazardous waste facilities selected by the contractor, other documents reviewed by DOD and regulators, such as the cleanup contractor's work plans or program plans, will identify the facilities receiving the hazardous waste. Figure 1 provides a brief description of the process that the Army's Rocky Mountain Arsenal followed in 1989 to select an off-site disposal facility owned by Encycle for disposal of waste that was subject to CERCLA requirements.

Figure 1: Rocky Mountain Arsenal's Process for Selecting the Off-Site Disposal Facility for Hazardous Waste from Basin F

In February 1989, the Army and Shell Oil Company (Shell) entered into an agreement with EPA and other federal entities governing the cleanup at the Rocky Mountain Arsenal in Colorado. The Army and Shell, who both had manufactured chemicals at the site, agreed to initiate or continue a number of actions to clean the site and share certain costs of the cleanup under the oversight of EPA. The agreement covered actions by the Army and Shell to remove the liquid within and the soil underneath an evaporation pond known as Basin F. During its operation, from 1957 to 1982, Basin F was used as a disposal site for various wastewaters and, at times, was filled to its capacity (approximately 240 million gallons). Approximately 11 million gallons remained in the basin at the time of its closure in 1988. The wastewater was contaminated with pesticides and metals, such as copper, arsenic, and zinc. Disposal activities regarding this waste were subject to the requirements under CERCLA.

The Army evaluated numerous cleanup methods to treat and dispose of the wastewaters in Basin F. They decided, with involvement from both the public and EPA, to treat the wastewater by using a liquid incinerator. In its decision document, the Army and Shell stated that burning the liquid at high temperature would destroy the organic compounds in the liquid. After burning the liquid in the incinerator, the process would result in a liquid which contained dissolved salts and residual metals. According to Army arsenal officials, the residue was a brine material similar in consistency to seawater. This remaining brine material would require further disposal for the cleanup process to be complete. The decision document noted that the low hazard level residual would need to be spray-dried into a solid form prior to disposal off site in a hazardous waste landfill.

The Army and Shell hired a contractor to implement the cleanup of Basin F liquids. According to officials involved with the cleanup, the contractor solicited open, competitive bids from companies to treat, recycle, and dispose of the brine material. Two companies submitted bids. The Arsenal's cleanup contractor selected Encycle, a facility located in Corpus Christi, Texas, partially because it offered a lower price, but also because the company offered to recycle the material instead of placing it in a landfill. While reviewing the bids, the contractor visited the company, reviewed its environmental permits, and ensured that Encycle was on EPA's list of approved facilities to receive the brine material. Encycle provided the contractor documentation from the Texas Water Commission (the state regulatory authority), which stated that the process Encycle used to process and smelt material could be considered as recycling under RCRA. (See appendix I for more details about this example.)

Source: GAO analysis of DOD information.

DOD Documents That Facilities Received Hazardous Waste from Its Installations but Relies on Regulators to Ensure That the Waste is Disposed of Properly

As required by RCRA, DOD tracks every hazardous waste shipment from DOD installations to the receiving hazardous waste facility using a universal tracking form called a "manifest" that EPA provides. RCRA regulations do not require DOD to oversee the physical operations of permitted facilities. That oversight is conducted by EPA and authorized state agencies that have overall responsibility for enforcing requirements designed to ensure these facilities dispose of hazardous waste properly.

Under RCRA, DOD is required to prepare a manifest for every shipment of hazardous waste that is shipped off site. This paper document contains information on the type and quantity of waste being transported, the

designated facility to receive the waste, and instructions for handling the waste. Each party in the chain of shipping, including DOD, must sign and keep a copy of the manifest. Once the waste reaches its destination, the receiving facility reviews the manifest for any discrepancies and returns a signed copy of the manifest to DOD confirming that the waste has been received. If DOD does not receive a copy of the manifest signed by the designated facility owner or operator within 45 days of the date the waste was accepted by the transporter, DOD must file a report with EPA.¹⁴ For both active installations and cleanups, DOD contractors generally prepare the manifest paperwork and review the manifests when they are returned, subject to DOD approval. However, DOD policy requires the installation commander (or his designee) to sign the manifest, and installation officials must review it upon return.

While the manifest allows DOD to verify that waste has been properly delivered, in some instances the facility the manifest designates to receive the waste may not be the actual disposal site for the waste. RCRA regulations currently require waste generators, including DOD, to track the waste to the facility designated on the manifest. This designated facility, in some cases, decides to send the waste to another permitted facility. Under current regulations, DOD would not receive manifests related to this subsequent waste transfer. Although not required by RCRA, DRMS has procedures that require its contractors to track the waste to the final disposal facility. DRMS requires its contractors to maintain a complete audit trail of the waste and submit the date the waste is received by the final disposal site to DRMS. When the services do not use DRMS to dispose of waste from active operations, they do not have procedures that require tracking the waste to the final disposal site.

RCRA regulations do not require DOD to oversee the physical operations of permitted facilities. That oversight is conducted by EPA and authorized state agencies that have overall responsibility for enforcing requirements designed to ensure these facilities dispose of hazardous waste properly. Only for certain types of hazardous waste disposal contracts involving the Army Corps of Engineers, does DOD have procedures to help ensure that the facility disposes of hazardous waste properly. For cleanups the Army Corps of Engineers conducts, the agency has issued guidance recommending that contracting officials should request a certificate

¹⁴If a facility is considered a small quantity generator, the manifest must be received within 60 days.

documenting disposal for all items that the facilities are asked to dispose of off site at their locations, including hazardous waste. The Army Corps of Engineers also recommends that its contracting officers withhold payment for disposal of the waste until they receive a copy of all manifests and the certificate of disposal from the facility treating and disposing of the waste.

Although not a routine practice, DRMS and the military services may also obtain certificates from hazardous waste treatment, storage, and disposal facilities documenting disposal of hazardous waste.¹⁵ DRMS structures its contracts so it has the ability to request its contractor to obtain a certificate of disposal if the DOD installation requests one. The installations must pay the contractors an additional fee to provide certificates of disposal. According to DRMS officials, they do not routinely collect certificates of disposal for all hazardous waste because the certificate does not eliminate any of DOD's liability if the facility improperly disposes of the waste. The officials said that DRMS tracks the waste until its receipt at the disposal facility, and they do not believe the certificates are worth the additional cost. Figure 2 describes the process that the Army's Rocky Mountain Arsenal followed for ensuring that an off-site disposal facility (Encycle) properly disposed of the Arsenal's Basin F hazardous waste.

¹⁵In addition to obtaining certificates of disposal for hazardous waste when requested by the installation, DRMS routinely obtains certificates of disposal for polychlorinated biphenyls, commonly referred to as PCBs, as required by the Toxic Substance Control Act. DRMS also requires certificates for demilitarization-required items and compressed gas cylinders.

Figure 2: Process Followed by the Army's Rocky Mountain Arsenal for Ensuring the Treatment, Storage, and Disposal Facility Properly Disposed of Waste from Basin F

From April 1993 to November 1995, the cleanup contractor for the Rocky Mountain Arsenal's Basin F evaporation pond sent the liquid brine remains of its incineration process to Encycle in Corpus Christi, Texas. According to Army and contractor officials involved with the cleanup, the contractor treated the Basin F liquids and generally filled two railcars with the remains each day. The contractor sent shipments of railcars to Encycle on a weekly basis for approximately 2-½ years. Each shipment was accompanied by the required RCRA manifests. In addition to using the manifests, the Army also established a one-person office in Corpus Christi, Texas, to ensure the arrival of the Basin F material at Encycle. The Army official stationed in Corpus Christi was responsible for ensuring the railcars arrived at the facility.

Once Encycle received the brine material, the company used a treatment process to recover the metal content from the brine. Encycle then sent the material it extracted from the brine to a copper smelter in El Paso, Texas, owned by its parent company, Asarco. Under RCRA, certain metal recovery activities are considered recycling and therefore the raw material may be regulated differently than most hazardous waste. According to Army and contractor officials, Encycle provided certificates of reclamation to the Army after processing each shipment received. The certificate of reclamation form included the railcar number, the RCRA hazardous waste manifest number, and an "on or about date" which listed the date Encycle processed the liquid brine for recycling.

In addition to obtaining manifests and certificates of reclamation, the Army and Shell also paid for a neutral party to conduct oversight of its work treating the Basin F liquids. With funds provided by the Army and Shell, EPA selected a contractor to conduct independent technical oversight of the project. In addition to reviewing the operations at the Arsenal, the oversight contractor conducted site visits to Encycle to review the treatment process. These visits to Encycle were conducted prior to the receipt of the waste shipments and after the shipments began. During a visit in June 1993, the oversight contractor reported that Encycle was meeting or exceeding the requirements necessary for compliance with state, federal, and local permits.

Source: GAO analysis of DOD information.

EPA and Authorized State Agencies Are Responsible for Approving Permits for Hazardous Waste Facilities and Monitoring Their Performance

EPA and authorized state agencies are responsible for issuing permits required under RCRA to hazardous waste disposal facilities and monitoring the facilities' performance to ensure that they dispose of hazardous waste safely and in accordance with laws and regulations. RCRA requires permitted facilities to be inspected at least once every 2 years by either EPA or the authorized state. If EPA or the authorized state finds a violation, they may take certain enforcement actions based on the nature and severity of any problems identified.

EPA and Authorized State Agencies Are Required to Issue Permits to Facilities That Handle Hazardous Waste

Because of the potential risks hazardous waste facilities pose to human health and the environment, most facilities that treat, store, or dispose of hazardous waste must obtain an RCRA permit from EPA or an authorized state agency.¹⁶ The RCRA permit is a legally binding document that establishes the hazardous waste management activities a facility can conduct and the conditions under which a facility can conduct them. The permit outlines facility design, construction, and operation; lays out safety standards; and describes activities that the facility must perform to comply with the related regulations, such as monitoring and reporting. Although EPA or authorized state agencies may issue permits, according to EPA officials, the majority of permits are issued by the authorized state agencies.¹⁷

To obtain an RCRA permit, hazardous waste treatment, storage, and disposal facilities must submit a comprehensive permit application to the permitting agency. Permit applications are often lengthy. Among other things, the application must include the types of waste the facility plans to handle, the anticipated waste management processes, plans for analyzing waste arriving at the facility, and a plan to respond to emergencies caused by hazardous waste releases from the facility. The application must also include information demonstrating the owner's ability to finance environmental cleanup after the facility closes.

When a permit application is received, the permitting agency reviews it to ensure it includes all the required information and evaluates the proposed design and operation of the facility to determine if it can be built and operated safely. If information is missing, the permitting agency will request the information from the applicant and review it once it is received. After any revisions are completed, the permitting agency makes a preliminary decision to issue or deny the permit. If the agency decides the application is complete and meets all applicable regulatory requirements, it will issue a draft permit stating the conditions under which the facility can operate if it receives a final permit. After providing the public with notice and an opportunity to comment on the draft permit,

¹⁶EPA regulations provide exceptions that allow some facilities to handle hazardous waste without obtaining an RCRA permit. Facilities that do not require a permit include generators that do not store hazardous waste for long periods of time, transporters of hazardous waste, and farmers disposing of certain pesticides on their own land.

¹⁷EPA issues permits or portions of permits if the state agencies are not authorized.

and after considering any public comments, the permitting agency issues or denies a final permit.

RCRA permits are effective for a fixed term of up to 10 years but can be issued for less than this full term. EPA views permits as living documents that can be modified to allow a facility to, among other things, implement technological improvements, comply with new environmental standards, or begin managing additional types of waste.

Monitoring and Enforcement Actions by EPA and Authorized State Agencies Are Intended to Ensure the Proper Handling and Disposal of Hazardous Waste and to Address Violations

Once a permit is issued to a hazardous waste treatment, storage, and disposal facility, EPA and the authorized state agencies monitor the construction and operation of a facility to ensure it complies with state and federal regulations and with the conditions of its permit. The primary tool EPA and the authorized state agencies use for monitoring hazardous waste treatment, storage, and disposal facilities are inspections. Under RCRA, facilities must be inspected at least once every 2 years, and federal- and state-operated facilities must be inspected annually. According to EPA officials, authorized state agencies have the primary responsibility to conduct inspections under RCRA for these facilities. While the authorized state agencies conduct the majority of inspections, EPA also conducts some inspections. EPA's guidance to its regions requires EPA regions to inspect at least two facilities in each state every year.¹⁸ Facilities may also be inspected at any time if EPA or the state has reason to suspect that a violation has occurred.

Although there are many types of inspections, the compliance evaluation is the primary mechanism for detecting RCRA violations. These inspections typically encompass an on-site examination of the waste management areas, a review of the facility's records, and an evaluation of the facility's compliance with RCRA. Figure 3 describes how the state of Texas permitted and inspected the Encycle treatment, storage, and disposal facility.

¹⁸According to EPA officials, this guidance is flexible as some states may not have any permitted facilities.

Figure 3: Encycle Hazardous Waste Permit and RCRA Inspection Information

In September 1988, the Texas Water Commission initially permitted Encycle to receive, store, and manage hazardous and nonhazardous industrial solid waste in accordance with its RCRA permit for a 10-year period. Encycle's 1988 permit was superseded and replaced by a revised permit from the Texas Water Commission in July 1992. According to Texas Commission on Environmental Quality officials, the revised permit was the result of a permit modification which authorized Encycle to construct and operate additional hazardous waste storage units and to accept additional types of waste. The revised permit required Encycle to notify and receive authorization from the Executive Director of the Texas Water Commission before accepting any additional kinds of waste not specifically authorized under the permit—a procedure Encycle followed before accepting the liquid brine hazardous waste from the Army's Rocky Mountain Arsenal. (See appendix I for additional information.)

RCRA requires permitted hazardous waste facilities, among others, to be inspected at least once every 2 years by either EPA or an authorized state. According to Texas Commission on Environmental Quality data, Encycle received 17 routine on-site RCRA compliance evaluation inspections while the company was in operation between 1988 and 2003. Furthermore, the data showed that Encycle also received an additional 20 inspections which included 4 RCRA case development inspections (carried out in conjunction with the legal case EPA and Texas were developing against Encycle and Asarco for alleged improper hazardous waste management and illegal recycling) and 12 record reviews.

Source: GAO analysis of Texas Commission on Environmental Quality data.

When noncompliance is detected, EPA or the authorized state agency may take an enforcement action against an individual or facility. Typically, the agency that uncovered the violation during an inspection will take the lead in pursuing the enforcement action. As a result, the authorized state agencies are responsible for the majority of the RCRA enforcement actions because they conduct the majority of RCRA inspections. However, EPA retains its authority to take enforcement actions in authorized states if needed, and EPA conducts oversight of the authorized state agencies' enforcement programs.¹⁹

EPA and the authorized state agencies select an enforcement action based on the nature and severity of the problems identified. The types of actions that can be used include administrative, civil judicial, or criminal enforcement. Administrative actions include informal actions where EPA or the authorized state agencies notify a facility regarding steps the facility needs to take to come into compliance. Administrative actions also

¹⁹GAO examined EPA's efforts to improve oversight of states' enforcement programs and identified additional actions EPA could take to ensure more consistent state performance and oversight in GAO, *Environmental Protection: EPA-State Enforcement Partnership Has Improved, but EPA's Oversight Needs Further Enhancement*, [GAO-07-883](#) (Washington, D.C.: July 2007).

include formal administrative orders that impose enforceable legal requirements on facilities to take specific corrective measures to comply with regulations. The order may also explain the enforcement actions that will follow if the facility fails to remedy the problem. In addition to administrative actions, EPA and the authorized state agencies can file a civil judicial action against violators. These lawsuits are often used in situations that present repeated or significant violations or when there are serious environmental concerns. EPA and the authorized state agencies may also bring criminal enforcement actions for serious violations, such as knowingly transporting waste without a manifest or treating, or storing, or disposing of waste without a permit. Attorneys from the Department of Justice prosecute RCRA civil and criminal cases for EPA, while the state attorney generals assume this role for the states. Results of enforcement actions include the assessment of monetary penalties against individuals or facilities and the suspension or revocation of a facility's permit.²⁰ Figure 4 describes the civil judicial enforcement action that the Department of Justice initiated on behalf of EPA and Texas against Asarco and Encycle which led to a consent decree between EPA, Texas, and Asarco.

²⁰Certain types of formal administrative actions and civil judicial actions can contain penalties of up to \$32,500 per day of noncompliance, while others can result in penalties up to \$6,500 per day. For example, a formal administrative corrective action to treat ground water contamination could result in a penalty of \$32,500 per day, while a formal administrative order to conduct monitoring, analysis, and testing could result in penalties of up to \$6,500 per day. Additionally, RCRA identifies seven activities that can trigger criminal enforcement actions, with six of these carrying a penalty of up to \$50,000 per day and up to 5 years in jail. The seventh—knowingly transporting, treating, storing, disposing, or exporting any hazardous waste in a way that another person is placed in imminent danger of death or seriously bodily injury—carries a possible penalty of up to \$250,000 or 15 years in prison for an individual or a \$1 million fine for corporate entities. EPA's RCRA *Civil Penalty Policy* provides guidance in assessing noncriminal penalty amounts for administrative actions and in settlements of civil judicial enforcement actions.

Figure 4: Civil Judicial Enforcement Action and Consent Decree Between EPA, Texas, and Asarco

In April 1999, EPA and Texas filed a civil enforcement action in federal district court alleging that Encycle/Texas, Asarco's wholly-owned subsidiary in Corpus Christi, and Asarco's smelter in El Paso, Texas, and other Asarco locations violated RCRA by failing to properly manage hazardous waste and engaging in unlawful recycling practices. The parties simultaneously entered into a settlement, under which Asarco agreed to carry out certain environmental cleanup actions and pay specified penalties. Under the settlement, while Asarco did not admit to the alleged violations, it agreed to implement site-wide cleanup actions at the Encycle/Texas facility and to modify the facility's operations to bring the facility into compliance with RCRA. Asarco also agreed to pay \$5.5 million in penalties; upgrade and maintain a 30-acre public conservation area in Corpus Christi, Texas; pay for off-site paving projects in El Paso, where particulates are a major problem; annually recycle 1,200 tons of shredded tires when the El Paso smelter is operational for the next 5 years; and implement auditing of its environmental management system, including verification by independent auditors. After a public comment period, the court approved the consent decree containing the terms of the settlement in October 1999. The consent decree was modified in 2004 to direct Asarco and Encycle to expedite the required cleanup activities and to prohibit the Encycle facility from accepting off-site waste. (See appendix II for more information about the enforcement action taken by EPA.)

Source: GAO analysis of EPA information.

In an effort to help complement the inspection and enforcement monitoring actions previously discussed, EPA also provides facilities with incentives and compliance assistance to encourage voluntary compliance with RCRA. For example, EPA encourages facilities to audit themselves and disclose instances of noncompliance. If these facilities make good-faith efforts to promptly correct the violations, EPA may reduce or waive penalties.²¹ EPA has also developed audit protocols to assist and encourage businesses and organizations to perform environmental audits and disclose violations in accordance with EPA's audit policy. Additionally, EPA has developed industry sector profiles—sometimes referred to as “sector notebooks”—to help owners and operators of regulated industries understand regulations that may apply to their operation. Sector notebooks are available on EPA's Web site.

²¹EPA's *Final Policy on Compliance Incentives for Small Businesses* is intended to promote environmental compliance among small businesses, while EPA's *Incentives for Self-Policing: Discovery, Disclosure, Correction, and Prevention of Violations* encourages regulated entities to adopt environmental auditing or management systems designed to uncover violations of environmental requirements and disclose them to EPA.

EPA and Facility Owners Provide Limited Public Information on Hazardous Waste Releases and Enforcement Actions Taken

Certain federal laws, such as CERCLA, the Emergency Planning and Community Right-to-Know Act, and RCRA require facilities and regulators to report certain information to the public regarding hazardous waste releases and related enforcement actions. For hazardous waste releases, both EPA and the facilities must report various types of information depending on the hazardous waste involved, the amount released, and the type of facility, among other things. For example, under the Emergency Planning and Community Right-to-Know Act, facility owners must immediately report the accidental release of a broad range of hazardous substances to local emergency responders if a release exceeds regulatory thresholds. Depending on the type of hazardous substance and the amount released, facilities may also be required under CERCLA to report the release to the federal National Response Center.²² The National Response Center maintains reports of all hazardous releases and spills in a national database dating back to 1990 and makes information, such as the date, location, company involved, and type and cause of the incident, publicly available on its Web site.

In addition, certain facilities that manufacture, process, or otherwise use any of 581 individual chemicals and 30 chemical categories must report annually to EPA and their respective state, the amount of these chemicals they released into air, soil, or water. These reports, contained in EPA's Toxic Chemical Release Inventory, contain information about a facility, such as the name, location, and type of business; an estimate of the maximum amounts of the toxic chemical present at the facility during the preceding year; the quantity of the toxic chemical entering the air, soil, and water annually; and the quantity of the chemical disposed of on-site or transferred off site. EPA is required to make this information available to the public and maintains a national Toxic Release Inventory database on its Web site, which provides summary information on facility toxic releases.

For enforcement actions taken against the hazardous waste treatment, storage, and disposal facilities, EPA and authorized state agencies have few requirements for reporting information publicly but may provide some

²²The National Response Center is the federal government's national communications center that receives all reports of releases involving hazardous substances and oil that trigger federal notification requirements under several laws, including the Clean Water Act, the Toxic Substance Control Act, and RCRA. The Center was established under the National Oil and Hazardous Substances Pollution Contingency Plan and is staffed 24 hours a day, 365 days per year.

information about the violation and any penalty imposed. For cases involving alleged discharges of pollutants, the Department of Justice must generally provide public notice of and an opportunity to comment on proposed settlements at least 30 days before the judgment is entered by the court.²³ EPA may also publicly share information about enforcement actions against treatment, storage, and disposal facilities by issuing press releases. However, there are no criteria for determining which enforcement actions warrant press releases; EPA decides whether to issue press releases on a case by case basis. For example, EPA, along with the Department of Justice and Texas, decided to issue a press release about the consent decree that was filed between EPA, Texas, and Asarco related to the RCRA violations that EPA and the state found at Encycle and Asarco (see fig. 5).

In addition, EPA maintains a Web site that provides the environmental compliance history of regulated facilities. Since November 2002, EPA's Enforcement Compliance History Online database has provided publicly accessible compliance information that includes facility-specific reports on inspections, violations, penalties, and enforcement actions for the most recent 5-year period. EPA developed this initiative to encourage compliance with Securities Exchange Act environmental disclosure requirements, which require facilities to report on their environmental liabilities and compliance costs.

Figure 5: Information Provided to the Public by the Department of Justice, EPA, and Texas in a Press Release Regarding the Enforcement Action Against Asarco

In April 1999, EPA, the Department of Justice, and Texas announced in a press release that the agencies had reached a settlement with Asarco concerning alleged RCRA violations at its Corpus Christi and El Paso facilities. The press release summarized the settlement agreement. The press release also stated that the proposed settlement would be published in the Federal Register for a 30-day public comment period and was subject to court approval. Additionally, a fact sheet outlining the specifics of the settlement accompanied the announcement. The press release did not provide details of the alleged violations against Asarco.

Source: GAO analysis of EPA information.

Agency Comments and Our Evaluation

We provided a draft of this report to EPA and DOD for the review and comment. Additionally, we provided a draft of appendixes I and II to Asarco for its review. EPA generally agreed with the report, as indicated in its letter in appendix III, and provided a number of technical comments,

²³28 CFR 50.7.

which we incorporated as appropriate. DOD and Asarco only provided technical comments, which again were incorporated as appropriate.

We are sending copies of this report to interested congressional committees, as well as the Administrator of the Environmental Protection Agency and the Secretary of the Department of Defense. We also will make copies available to others upon request. In addition, the report will be available at no charge on the GAO Web site at <http://www.gao.gov>.

If you have any questions about this report, please contact me at (202) 512-3841 or mittala@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made major contributions to this report are listed in appendix IV.



Anu K. Mittal
Director, Natural Resources
and Environment

Appendix I: Off-Site Disposal of DOD Hazardous Waste from an Evaporation Pond at DOD's Rocky Mountain Arsenal

This appendix provides information on the treatment and off-site disposal through recycling of hazardous waste from an evaporation pond at the Department of Defense's (DOD) Rocky Mountain Arsenal.

Background on Army's Basin F Evaporation Pond

The Army established the Rocky Mountain Arsenal in 1942 to manufacture chemical weapons, such as mustard gas. The Arsenal covers about 17,000 acres and is located approximately 10 miles northeast of Denver, Colorado. After World War II, the Army began leasing part of the Arsenal to private industry. Shell Chemical Company leased facilities at the Arsenal for the production of agricultural chemicals, including pesticides, until 1982.

In 1956, an evaporation pond called Basin F was created for the disposal of various wastewaters from the site's manufacturing process and wastes from demilitarization activities. During its 24 years of operation, Basin F was at times filled to its capacity of approximately 240 million gallons. Approximately 11 million gallons remained in Basin F at the time of its closure in 1988. The wastewater was contaminated with pesticides and metals, such as copper, arsenic, and zinc.

Army Agreed to Clean up Basin F Liquid

In 1984, the Army began a systematic investigation of contamination at the Arsenal in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980. In 1986, the Army, Shell Oil Company (Shell), and the Environmental Protection Agency (EPA) signed a memorandum of understanding outlining the cleanup of Basin F that allowed the Army to begin cleaning the site in advance of a final cleanup plan. Between May 1988 and December 1988, the Army removed the liquid waste from Basin F for temporary storage in holding tanks.

In 1989, the Army and Shell entered into a Federal Facility Agreement with EPA and other federal entities governing the cleanup at the Rocky Mountain Arsenal. The Army and Shell agreed to initiate or continue actions to clean the site and share certain costs of the cleanup under the oversight of EPA. The agreement called for thirteen interim response actions focused on immediate cleanup needs to remove threats to the environment. One of these actions required the Army and Shell to continue cleanup of contaminated liquids, sludge, and soil from and under Basin F.

Army Selected a Cleanup Remedy and Off-Site Disposal Facility

The Army evaluated numerous cleanup methods to treat and dispose of the wastewaters in Basin F. The Army decided, with involvement from both the public and EPA, to treat the wastewater by using a liquid incinerator.¹ In its decision document, the Army stated that burning the liquid at high temperature would almost completely destroy the organic compounds in the liquid.² After burning the liquid in the incinerator, a liquid residue containing dissolved salts and residual metals would remain. According to Army arsenal officials, the residue was a brine material similar in consistency to seawater. This remaining brine material required further disposal for the cleanup process to be complete. The decision document noted that the low hazard level residual would need to be dried into a solid form and then disposed of off site in a hazardous waste landfill.

The Army and Shell hired a contractor to implement the cleanup of Basin F liquids. According to officials involved with the cleanup, the contractor solicited open, competitive bids from companies to dispose of the brine material remaining from the incineration process. Two companies submitted bids. The cleanup contractor selected Encycle, a facility located in Corpus Christi, Texas, partially because it offered a lower price, but also because the company offered to recycle the material instead of placing it in a landfill. As part of the bid review process, the cleanup contractor visited Encycle, reviewed its environmental permits, and ensured Encycle was on EPA's list of facilities approved to receive hazardous material from a CERCLA site.

Before Encycle could receive the liquid brine material from the Arsenal, Encycle needed to obtain approval from the Texas Water Commission to accept wastes other than those then allowed under Encycle's permit. Encycle met with the Texas Water Commission in early April 1993 and provided the state commission with additional clarifying information regarding the waste Encycle would receive from the Arsenal and details on how Encycle would analyze and process the waste. On April 20, 1993, the Texas Water Commission authorized Encycle to accept the brine material remaining from the incineration of the Basin F fluids at the Rocky Mountain Arsenal.

¹The process selected was a submerged quench incineration system.

²*Final Decision Document for the Interim Response Action, Basin F Liquid Treatment, Rocky Mountain Arsenal* (May 1990).

Cleanup of Army's Basin F Liquid

At the Arsenal, the cleanup contractor began to incinerate and process the Basin F liquid. After each batch of liquid was processed, the Arsenal cleanup contractor would place the brine remains of the incineration process in railcars and ship the railcars to Encycle. When Encycle received the brine material, the company used a chemical precipitation and filtration process to remove the metal content from the brine.³ Encycle sent the residue it extracted from the brine material to a copper smelter in El Paso, Texas, which played a role in recovering copper from the residue. The smelter was owned by its parent company, ASARCO (Asarco).

Encycle continued to receive, process, and recycle the material until November 1995. According to Army officials involved with the cleanup and the contractor, the contractor treated the Basin F liquids and generally filled two railcars with the remains each day. The contractor sent shipments of railcars to Encycle on a regular basis for approximately 2-½ years. According to officials involved with the cleanup, the Arsenal processed more than 11 million gallons of liquid through its incinerator and generated more than 16 million gallons of brine material (this included liquids from Basin F and additional liquids used in the incineration process) that was sent to Encycle for further treatment and recycling. According to Army officials, Encycle recovered 250,000 pounds of copper from the material it received from the Arsenal.

Army Procedures to Ensure Encycle Received and Properly Disposed of DOD's Waste

In addition to selecting a permitted facility approved to receive its waste, the Army implemented a number of procedures to ensure that Encycle received and properly recycled its waste. According to Army officials and the cleanup contractor, Encycle provided Resource Conservation and Recovery Act (RCRA) manifests for each shipment it received. In addition, Encycle provided certificates of reclamation to the Army after processing each shipment. The certificate of reclamation form included the railcar number, the RCRA hazardous waste manifest number, and an "on or about date" that listed the date Encycle processed the liquid brine for recycling. In addition, the Army established a one-person office in Corpus Christi, Texas, to ensure the arrival of the Basin F material at Encycle.

Finally, to assist EPA in its oversight role, the Army and Shell also paid for a neutral party to conduct oversight of the work relating to treating the

³The remaining liquid from the precipitation and filtration process was treated and discharged from Encycle's permitted wastewater treatment facility.

**Appendix I: Off-Site Disposal of DOD
Hazardous Waste from an Evaporation Pond
at DOD's Rocky Mountain Arsenal**

Basin F liquids. With funds provided by the Army and Shell, EPA selected a contractor who reviewed the operations at the Arsenal and also conducted site visits to Encycle to review the treatment process. The oversight contractor conducted a visit to Encycle prior to the receipt of the waste shipments and conducted another visit once shipments began. In a letter to EPA conveying the results of a June 1993 visit, the oversight contractor reported that Encycle was meeting or exceeding the requirements necessary for compliance with federal, state, and local permits.

Appendix II: Recycling Activities at Encycle and Asarco's El Paso Smelter and EPA's Enforcement Action

This appendix provides information on the recycling practices of two facilities in Texas involved in events related to the treatment of hazardous waste from DOD's Rocky Mountain Arsenal. It also details EPA's and Texas's enforcement actions against these facilities, the ensuing consent decree, the status of the company's efforts to comply with the consent decree, and the impact of the recycling practices on the environment in El Paso, Texas.

Encycle and Asarco Recycling Practices

Asarco, a company with smelting operations in numerous states, operated smelting and refining operations at its El Paso, Texas, facility for over 100 years.¹ The original plant was built in 1887 along the Rio Grande River to process ore from the mines in Mexico and the American Southwest and operated until 1999.² Asarco also operated a zinc smelter from 1942 to 1985 in Corpus Christi, Texas. In 1988, a company named Encycle, which was a wholly-owned subsidiary of Asarco, began a metals recycling operation at the Corpus Christi, Texas site.

Encycle was established to reclaim copper and other metals from hazardous waste materials. Encycle received hazardous waste from industrial sources nationwide. According to Asarco officials, Encycle would test the waste to ensure that the waste met its acceptance criteria, which prohibited radioactive material, explosive material, and dioxins. Encycle would then separate the copper-containing material from the waste through various processes.³ The end product was a copper concentrate that was suitable for smelting. Encycle would then send the material it extracted to several facilities owned by its parent company, Asarco, and other metal reclaiming facilities. The Asarco facilities used a furnace to smelt the material. After additional processing steps, Asarco recovered copper from the material. The Encycle facility operated under a permit from the state for the storage and processing of hazardous and nonhazardous solid wastes.

¹In 1899, the smelter incorporated into the American Smelting and Refining Company and operated under that name until 1975 when the company officially became ASARCO, Incorporated.

²There is disagreement among Asarco and certain parties involved with a Clean Air Act permit that the company is currently seeking to renew for this plant about whether the smelter's shutdown was temporary or permanent. GAO does not address this issue in this report.

³Encycle would separate the copper-containing material using a chemical, filtering, and drying process.

Under RCRA, certain activities are considered recycling and, therefore, are regulated differently than most hazardous waste management activities. Encycle and Asarco asserted that the work they were conducting classified as recycling under RCRA. Under RCRA regulations, "materials are not solid wastes (and therefore not hazardous wastes) when they can be shown to be recycled by being used or reused as effective substitutes for commercial products."⁴ This provision is sometimes referred to as the "use / reuse exemption." Encycle and Asarco argued that the copper concentrates Encycle produced and sent to Asarco's smelters were substitutes for the virgin copper concentrates used at primary copper smelters. As a result, the material Encycle sent to its smelters would no longer be governed by RCRA hazardous waste requirements. Encycle requested and received concurrence from the Texas Water Commission, which is the state regulatory authority, in September 1989 that the materials it supplied to the Asarco smelter were "not solid waste when sent to a smelter for the production of refined metals."⁵

**EPA Enforcement Action
against Encycle and
Asarco**

During an EPA investigation of Asarco facilities in Montana and other states, EPA learned that Encycle was sending material to Asarco facilities to be smelted without an RCRA manifest.⁶ According to EPA officials, EPA decided to conduct inspections at Encycle to further study this issue. During 1997 and 1998, EPA and Texas performed RCRA compliance assurance reviews at Encycle and Asarco's facility in El Paso, Texas, and identified several RCRA violations.

To address the violations, EPA referred the case to the Department of Justice for prosecutive assistance in obtaining a civil judicial enforcement action. In April 1999, the Department of Justice, on behalf of EPA and the state of Texas, filed a complaint against Encycle and Asarco for various environmental violations at Encycle's Corpus Christi facility, Asarco's El

⁴40 CFR 261.2(e)(1)(ii).

⁵The Texas Water Commission was consolidated into the Texas Natural Resource Conservation Commission in 1993.

⁶Asarco and Encycle assert that the materials shipments were not hazardous waste and, hence, no manifest was required. The companies state that they relied on the 1989 determination of the Texas Water Commission that the materials Encycle shipped to Asarco were not hazardous waste.

Paso smelter, and other Asarco locations.⁷ The complaint alleged that the activities conducted by Encycle were not legitimate recycling activities. More specifically, EPA and Texas asserted that:

- Materials Encycle sent to the Asarco smelters were ineligible for the use / reuse exemption and, therefore, constituted hazardous waste. Although the Texas Water Commission had sent a letter to Encycle in 1989 agreeing that it could use this exemption, the agencies contended that Encycle had not accurately described the processes it employed.
- Encycle performed “sham” or illegitimate recycling because, among other things, the company routinely accepted wastes with “little or no metals values” and blended these wastes into its copper concentrates. The agencies argued that this was illegal treatment and disposal of hazardous waste since the wastes could not have contributed in any significant way to the production of Encycle’s copper concentrates.
- Encycle had violated RCRA by failing to manage these materials as hazardous waste. Encycle shipped the hazardous waste without a required RCRA hazardous waste manifest, and Asarco accepted the shipments of unmanifested hazardous waste. In addition, Asarco did not have a permit to store the hazardous waste and process it in its industrial furnace.

In October 1999, a federal court approved a consent decree between Asarco, EPA, and Texas resolving alleged RCRA violations at Asarco’s subsidiary Encycle and at the company’s El Paso, Texas, and East Helena, Montana, smelters, among other facilities. Under this consent decree, filed in the U.S. District Court for the Southern District of Texas, Asarco agreed to pay a civil monetary penalty of \$5.5 million and carry out certain environmental cleanup actions. As stated in the consent decree, Asarco and Encycle disputed these allegations and their assent to the decree did not constitute an admission of liability. Under the consent decree, Asarco and Encycle agreed to carry out the following:

- Pay a \$5.5 million civil penalty (\$2 million was awarded to the state of Texas, as co-plaintiff).

⁷The complaint also included violations at Asarco’s Amarillo copper refinery, and at Asarco’s six mines and mills in eastern Tennessee. The parties submitted a proposed settlement to the court to resolve the alleged violations on the same day the complaint was filed.

- Operate Encycle as authorized by a permit, the consent decree, or other authorization from the state.⁸
- Perform a metals recycling project at Encycle in which 522,000 lbs. of nickel, copper, chrome, or tin, having the potential to be carcinogenic or toxic to humans and wildlife, will be recovered annually for 5 years with a projected environmental benefit value of \$6.48 million.
- Clean up any contaminated areas at its El Paso and Corpus Christi, Texas, facilities.
- Upgrade and maintain a 30-acre public conservation area in Corpus Christi, Texas. The conservation area will include trails, an environmental education area, and a site for a state of Texas air-monitoring station.
- Spend at least \$1.85 million to pave roads, alleys, and parking lots in a dust-control project in El Paso, where Asarco operates a smelter. Particulates such as dust are known to exacerbate respiratory problems like asthma and emphysema and are a significant problem in the El Paso air basin.
- Recycle 1,200 tons annually of shredded tires, when the El Paso smelter is operational, for the next 5 years.
- Spend up to \$260,000 to restore a wetland at Asarco's Coy Mines, near Knoxville, Tennessee.
- Implement auditing of its environmental management system, including verification by independent auditors.

**Current Status of Encycle
and Asarco Activities and
Consent Decree Progress**

According to Asarco officials, Asarco temporarily suspended its smelting operations in El Paso in 1999 due to business concerns, including the declining price of copper.⁹ The Encycle facility ceased operations in 2003. Both Encycle and Asarco have since filed for bankruptcy.

⁸The consent decree was modified in 2004 to direct Asarco and Encycle to expedite the required cleanup activities and to prohibit the Encycle facility from accepting off-site waste.

⁹As discussed previously (see fn. 2), there is disagreement over whether Asarco's shutdown was temporary or permanent.

According to the Deputy Director for the Texas Commission on Environmental Quality Office of Legal Services, Asarco has completed about 40 percent of the remediation activities at its El Paso facility required under the consent decree and estimates the company will complete the remaining activities by 2010. The decree also required Asarco to establish and fund a \$1.85 million 5-year supplemental environmental project to reduce particulate matter by paving certain streets in El Paso. According to the commission official, the company provided about \$740,000 to the El Paso City Public Works Department for the first and second years of paving, while the third through fifth years of the project have not yet been funded. With regard to meeting the Encycle commitments under the consent decree, the commission official stated that the decree required Encycle to establish and fund a land conservation easement on wooded property adjacent to the facility and estimated that this supplemental environmental project was about 40 percent complete. The facility had been conducting remediation activity until it was placed under bankruptcy proceedings. A revised September 2007 expert report conducted on behalf of the Texas Commission on Environmental Quality estimated that it would cost at least \$9.3 million to demolish the building and complete a closure and remedial action of the Encycle facility.

In March 2002, Asarco applied to the Texas Commission on Environmental Quality to renew its air quality permit so that it could resume its copper smelting operations at the El Paso facility. The commission required Asarco to provide additional information regarding the permit renewal, such as emission data related to the company's copper smelter and its impact on the surrounding areas. As of October 2007, a final decision regarding the renewal has not been rendered by the Texas Commission on Environmental Quality.

**EPA and Texas
Commission on
Environmental Quality's
Comments on the
Environmental Impact of
Encycle and Asarco's
Recycling Activities**

According to officials with the Texas Commission on Environmental Quality and EPA, the smelting of Encycle's hazardous waste at the Asarco facility in El Paso, Texas, did not have a harmful impact on the environment. According to a June 2006 interoffice memorandum from a regional director with the Texas Commission on Environmental Quality, Encycle shipped wastes to Asarco between 1989 and 1997, and, according to Asarco, the material shipped accounted for only about 2 percent of the total concentrate the company smelted during this period.¹⁰ However, the regional director noted that the smelting and handling of the Encycle material was not done any differently from how Asarco processed its traditional concentrate. Additionally, the official stated that the fumes and particulate matter generated from smelting the Encycle concentrate were captured and recycled back into the process as is normal practice. In summary, the official stated that it appeared highly unlikely that smelting the Encycle concentrate would have resulted in any increase in emissions or abnormal occupational exposure at Asarco. Officials with EPA Region 6's Office of Regional Counsel that we spoke with also stated that they did not believe there would have been a significant harmful release from smelting the Encycle hazardous wastes at Asarco. The EPA officials also commented that if Asarco had obtained the proper permits and followed the applicable RCRA regulations, the company could have legally conducted the smelting of the materials it received from Encycle.

**Relationship between
EPA's Enforcement Action
and DOD's Hazardous
Waste from the Rocky
Mountain Arsenal**

As discussed in appendix I, DOD's Rocky Mountain Arsenal processed more than 11 million gallons of liquid through its on-site incinerator to remove organic compounds. DOD officials estimated that 81,000 tons of the liquid brine remains were sent to Encycle for treatment and disposal between April 1993 and November 1995. EPA inspections that led to its enforcement actions against Encycle were conducted several years after Encycle had received and processed the Arsenal's waste.

According to EPA officials involved in the investigation, EPA did not investigate whether the Arsenal's waste had been recycled and disposed of properly. However, EPA did study some of Encycle's management and process records and documented the metal content of some shipments

¹⁰The regional director with the Texas Commission on Environmental Quality wrote the June 6, 2006, Interoffice Memorandum in response to an interview regarding the exposure of hazardous materials at Asarco. The regional director stated the memo was based in part on records filed under an EPA RCRA information request and Texas Commission on Environmental Quality files related to Asarco.

Encycle received. These documents included information about the shipments received from the Arsenal. EPA included the findings from this work in a document sent to Asarco's attorneys during settlement discussions in July 1998.¹¹ In this document, EPA included data on a number of shipments received by Encycle for processing that contained little or no metal content. Included in this data were 4 shipments received from the Arsenal of approximately 300 tons of waste in July 1995 that was identified as leachate (runoff water that collects contaminants as it trickles through waste). According to Army officials, during the process to clean the evaporation pond, solid materials from the pond were collected and placed in piles. The Army cleanup contractor collected the water that ran off of these piles and added it to the liquid brine that was sent to Encycle to be treated and disposed.

According to EPA officials that oversaw the Arsenal's cleanup, the Arsenal followed CERCLA requirements when selecting Encycle to receive its waste. As discussed in appendix I, the Army confirmed that Encycle received each shipment of waste through manifests and certificates of reclamation. In addition, the Army established a one-person office in Corpus Christi, Texas, to ensure the arrival of the Basin F material at Encycle. The Army official was responsible for ensuring the railcars arrived at the facility. While EPA found 4 shipments that may not have had significant metal content, the EPA officials did not believe that this was the case with all of the shipments received at Encycle from the Arsenal. The officials noted that Encycle/Asarco reported retrieving 250,000 pounds of copper from the Army's waste.

During a meeting with Asarco, company officials told us that the virgin ore from copper mines the Asarco facilities smelted generally contains less than 1 percent copper. The Asarco officials said that they believed EPA did not take this into consideration when EPA reviewed the materials Encycle sent to the smelters and alleged they contained little or no metal content.

¹¹According to EPA, this information was not submitted as evidence during legal proceedings but was used during settlement negotiations.

Appendix III: Comments from the Environmental Protection Agency



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

NOV 1 2007

OFFICE OF
SOLID WASTE AND
EMERGENCY RESPONSE

Ms. Anu K. Mittal
Director, Natural Resources and Environment
Government Accountability Office
441 G. Street, NW
Washington, D.C. 20548

Dear Ms. Mittal:

This letter is in response to the Government Accountability Office (GAO) draft report titled: "Hazardous Waste: Information on How DOD and Federal and State Regulators Oversee the Off-Site Disposal of Waste from DOD Installations (GAO-08-74, November 2007)." We appreciate the opportunity to review the draft report and also the effort GAO has taken to describe how Department of Defense (DOD) installations manage their hazardous wastes, and how those activities are overseen by federal and state regulators.

We have reviewed the draft report and, while we generally agree with most of it, noting that the report did not include any recommendations, we do have several comments regarding areas that we believe need clarification. For example, one area we believe needs clarification is DOD's role in ensuring that hazardous waste is managed appropriately by a designated facility. Another area is DOD's use of the hazardous waste manifest in tracking waste shipments to designated facilities. We have provided our comments on these and other areas in the enclosure.

Thank you for the opportunity to comment on the draft report. If you have any questions on our comments, please contact Michael Galbraith of my staff at (703) 605-0567.

Sincerely,


Susan Parker Bodine
Assistant Administrator

Enclosure

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Appendix IV: GAO Contact and Staff Acknowledgments

GAO Contact

Anu K. Mittal, (202) 512-3841 or mittala@gao.gov

Staff Acknowledgments

In addition to the contact named above, Edward Zadjura, Assistant Director; Leigh White; Richard Johnson; Kirk Menard; Alison O'Neill; Peter Singer; and Jay Spaan, made contributions to this report.

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