United States General Accounting Office

GAO

Report to the Chairman, Environment, Energy, and Natural Resources Subcommittee, Committee on Government Operations, House of Representatives

April 1992

HAZARDOUS WASTE

Impediments Delay Timely Closing and Cleanup of Facilities

146714

RESTRICTED--Not to be released outside the General Accounting Office unless specifically approved by the Office of Congressional Relations.

RELEASED

GAO/RCED-92-84

GAO

United States
General Accounting Office
Washington, D.C. 20548

Resources, Community, and
Economic Development Division

B-246603

April 10, 1992

The Honorable Mike Synar
Chairman, Environment, Energy, and
Natural Resources Subcommittee
Committee on Government Operations
House of Representatives

Dear Mr. Chairman:

As requested, we are reporting on the Environmental Protection Agency's (EPA) inspection of closing land disposal facilities and enforcement actions taken against facilities found in violation of the Resource Conservation and Recovery Act's requirements. Also, we are reporting on factors delaying the proper closing of these facilities. Our report contains recommendations aimed at improving the inspection and enforcement process and minimizing delays in the closing of facilities.

As arranged with your office, unless you publicly announce its contents earlier, we will make no further distribution of this report until 30 days after the date of this letter. At that time, we will send copies to appropriate congressional committees; the Administrator, EPA; and the Director, Office of Management and Budget. We will also make copies available to other interested parties upon request.

This work was performed under the direction of Richard L. Hembra, Director, Environmental Protection Issues, (202) 275-6111. Other major contributors to this report are listed in appendix I.

Sincerely yours,

J. Dexter Peach
Assistant Comptroller General

Executive Summary

Purpose

In 1985, 837 of the nation's 1,538 land disposal facilities for hazardous waste were required to close because they were unable or unwilling to meet new operating requirements. Even though these facilities were to have closed by 1987, as of October 1991 only 257 had done so. Unless the remaining 580 facilities are properly closed and cleaned up in a timely manner, they potentially threaten human health and the environment.

Concerned that the Environmental Protection Agency (EPA) is not progressing in a timely and effective manner to ensure that facilities are properly closed, the Chairman of the Environment, Energy, and Natural Resources Subcommittee, House Committee on Government Operations, asked GAO to examine EPA's inspection and enforcement efforts to ensure compliance with closure and post-closure requirements. GAO also reviewed impediments, such as inadequate groundwater monitoring systems, that delay the proper closing of these facilities.

Background

The Resource Conservation and Recovery Act of 1976 (RCRA) provides the regulatory framework for controlling hazardous waste. While EPA has overall responsibility for implementing RCRA, 45 states, the District of Columbia, and Guam have been authorized to administer the program. EPA, then, oversees their activities.

RCRA required that owners/operators of land disposal facilities apply for operating permits by November 1985 or close their operations. Closure involves removing all hazardous waste or, if waste is left in place, installing a cover to contain the waste. Facilities that close by leaving waste in place must obtain a post-closure permit and conduct maintenance activities and groundwater monitoring for at least 30 years. These permits serve as the primary mechanism for cleaning up and correcting releases of hazardous waste at facilities. The 837 facilities that were required to close were to have completed closure by January 1987 and to have received their post-closure permits by November 1988. EPA's guidelines provide for annual inspections at all closing and operating land disposal facilities to determine if they comply with regulatory requirements promulgated under RCRA. If violations are found, timely and appropriate enforcement action is to be taken to bring facilities into compliance. Under EPA's enforcement policy, high-priority violators, or those violators having the most severe violations, are to be issued administrative orders and penalties within 135 days of an inspection. Alternatively, states can refer cases to EPA or to the state attorneys general for enforcement.

Results in Brief

The three states GAO reviewed have generally complied with EPA's guidelines by conducting annual inspections to determine facilities' overall compliance with RCRA and by conducting triennial inspections to determine the adequacy of facilities' groundwater monitoring systems. Though both types of inspections have revealed serious violations, EPA has recently relaxed its inspection time frames because of resource constraints at the federal and state levels. This action may allow violations to go undetected for a longer period of time.

Although the three states have not always followed EPA's enforcement policy, their success in ultimately closing facilities is more closely related to their success in ensuring that facilities install adequate groundwater monitoring systems. Facilities must install these systems in order to close and receive post-closure permits. More importantly, the systems are needed to fully characterize the threat these facilities pose.

In addition to the lack of groundwater monitoring systems, there are other factors that add to closure and post-closure delays. Once enforcement actions are initiated, lengthy negotiations and appeals delay the final resolution. A lack of guidance on the timing of post-closure permit applications can add further delays. While these delays may be temporary, ultimately there will be owners/operators who will be unable or unwilling to afford the high costs of closure. EPA has yet to fully assess which facilities will not close or to establish the best means to close them. As a result, contamination may continue to spread, increasing environmental and health risks.

Principal Findings

Impact of Inspection, Enforcement Practices, and Groundwater Monitoring Systems on Closure

By reviewing the timeliness of inspections for 20 closing facilities in three states over a 5-year period, GAO found that 96 percent of the compliance inspections were conducted annually, as directed by EPA. Similarly, 89 percent of the inspections of groundwater monitoring systems were conducted every 3 years, as directed by EPA. These inspections disclosed serious violations that affected closure at 19 of the 20 facilities. As important as inspections are, however, EPA has revised its guidance by decreasing the number of inspections required because of resource constraints at the federal and state levels. EPA's revisions could result in

fewer inspections' being conducted at facilities having serious violations, which could delay closure and the issuance of post-closure permits.

The states initiated a total of 55 enforcement actions from October 1985 to September 1990 against 19 of the 20 facilities GAO analyzed. Because these were high-priority violators, EPA's enforcement policy provided that states issue formal administrative orders with penalties or refer the violators to EPA or the state attorneys general within 135 days. While 53 of the actions were timely, 45 were informal notices of violation without penalties. One state environmental agency does not have the authority to issue administrative orders with penalties, and the other two states prefer to meet with owners/operators informally before taking formal action.

The type of enforcement action taken, however, seems less critical to the states' success in closing facilities than does the states' success in ensuring that facilities install adequate groundwater monitoring systems. While none of the three states has conformed fully with EPA's enforcement policy, GAO found that all 23 closing facilities in one state have installed adequate groundwater monitoring systems and 19 of the facilities have closed. In contrast, half of the 52 closing facilities in another state do not have approved systems, and only 12 of the facilities have closed. Unless the remaining facilities install adequate monitoring systems, they will be unable to close or receive post-closure permits. EPA has not determined how many closing facilities nationwide do not have adequate groundwater monitoring systems and acknowledges that without such systems in place, complete knowledge of the contamination threat is not known.

Other Impediments That Can Significantly Delay Closure and Issuance of Post-Closure Permits

Like groundwater monitoring, other factors outside the scope of EPA's enforcement policy can contribute significantly to delays in closing facilities and issuing post-closure permits. Delays occur in affording closing facilities due process once enforcement action has been taken. Federal and state judicial systems provide owners/operators opportunities to negotiate and appeal enforcement orders for long periods. EPA also has concentrated on issuing permits to operating facilities rather than to closing facilities because of the former's perceived higher priority. EPA has not established any guidance on when post-closure permit applications should be requested from owners/operators. Because of the delays in requesting permit applications, many facilities may not yet meet the requirements for obtaining a permit.

Some facilities may not be able to afford to comply with costly requirements, while others lack incentives to comply. The cost of installing a groundwater monitoring system ranges from a minimum of $20,000 to as high as $3 million. As of June 1991, 6 of the 97 closing land disposal facilities in the three states had been abandoned or declared bankruptcy, and state officials have concerns about the financial status of 13 other facilities. These facilities may eventually have to be turned over to the national or state cleanup programs. Once facilities become the responsibility of these programs, additional delays can occur, with cleanup costs averaging about $25 million. EPA has not yet developed a plan to determine which facilities nationwide will not close, whether these facilities have installed adequate groundwater monitoring systems, who will install these systems and when they will be installed, and who will be responsible for any necessary cleanup in a timely manner.

Recommendations

GAO recommends that EPA and the states (1) obtain data on the status of closing facilities' groundwater monitoring systems and develop a plan to address barriers preventing their installation and (2) reinstitute time frames for conducting inspections to determine if groundwater monitoring systems are installed and, if so, their adequacy. GAO also recommends, among other things, that the Administrator establish time frames for negotiating with facilities and develop guidelines specifying when post-closure permit applications are due. Recognizing that some owners/operators cannot or will not properly close their facilities, GAO also recommends that the Administrator develop a plan to identify these facilities, to take timely actions to ensure that adequate groundwater monitoring systems are in place, and—where groundwater conditions are unsatisfactory—to take timely actions to control or clean up any contamination.

Agency Comments

GAO discussed the information presented in this report with EPA Office of Solid Waste and Emergency Response officials. Their comments are included where appropriate. However, as requested by the Chairman's office, GAO did not obtain written agency comments.

Contents

Executive Summary		2
Chapter 1 Introduction		8
	Federal Role in Managing Hazardous Waste Disposal Facilities	8
	Requirements for Closing Facilities and Their Subsequent Care	9
	States' Administration of the Hazardous Waste Program	11
	Inspections and Enforcement Actions in Implementing RCRA	12
	Objectives, Scope, and Methodology	15
Chapter 2 Inspection and Enforcement Efforts Have Had Limited Success in Closing Facilities		19
	Relaxed Inspection Guidelines May Delay Closure and Issuance of Post-Closure Permits	20
	Closing Facilities Have Numerous Violations	23
	EPA's Enforcement Policy Not Being Implemented as Intended	24
	Lack of Adequate Groundwater Monitoring Is a Key Factor Delaying Closure and Post-Closure	30
	Conclusions	33
	Recommendations	35
Chapter 3 A Number of Impediments Significantly Delay or Prevent Proper Closing of Facilities		36
	Activities After Initial Enforcement Actions Lead to Delays	36
	Waste Removal Attempts Have Delayed Closure	39
	Lack of Guidance Delays Issuance of Post-Closure Permits	40
	Costs of Requirements Could Affect Compliance	42
	Few Incentives to Comply With Closing Requirements	43
	Limited Options for Closing Land Disposal Facilities When Enforcement Fails	44
	Conclusions	45
	Recommendations	46
Appendix	Appendix I: Major Contributors to This Report	48
Tables	Table 2.1: Timeliness of States' Compliance Inspections, Fiscal Years 1986-90	21
	Table 2.2: Timeliness of States' Groundwater Monitoring Inspections, Fiscal Years 1986-90	21

Table 2.3: States' Conformance With EPA's Enforcement Guidance for High-Priority Violators, Fiscal Years 1986-90 25
Table 2.4: EPA Regions' Enforcement Actions in Response to State Referrals, Fiscal Years 1986-90 29
Table 2.5: Groundwater Monitoring at Closing Facilities, June 1991 32

Figures

Figure 1.1: EPA's Timetable for Closing Land Disposal Facilities 10
Figure 1.2: Status of Closing Waste Disposal Facilities in Three States, June 1991 16

Abbreviations

EPA	Environmental Protection Agency
GAO	General Accounting Office
RCRA	Resource Conservation and Recovery Act

Introduction

According to the latest available data from the Environmental Protection Agency (EPA), about 275 million metric tons of hazardous waste are generated annually by U.S. industry. This translates into over 1 ton of hazardous waste generated per person, per year. Hazardous waste, if not controlled and properly managed, can potentially pose severe environmental and health risks. It can contain lead, arsenic, and mercury, which can cause cancer and birth defects in both humans and animals.

In some instances, industry can reduce or preclude the need to safely dispose of hazardous waste by generating less or none. In other instances, industry can recycle the waste. But generally, once hazardous waste is generated, industry has few options available to manage it. Historically, burying the waste has been the least expensive, and thus preferred, means of disposing of it. Past practices got the waste out of sight, but often did not focus on minimizing health and environmental effects. However, over the past two decades, the Congress has shown increased concern over the adverse health and environmental effects of hazardous waste land disposal facilities.

Federal Role in Managing Hazardous Waste Disposal Facilities

The Resource Conservation and Recovery Act of 1976 (RCRA) was enacted to regulate the management of hazardous waste and improve waste disposal practices. RCRA was designed to manage active or ongoing hazardous waste operations. These operations include disposal, incineration, treatment, and storage in various waste management units, such as landfills, surface impoundments, waste piles, tanks, and container storage areas. Facilities having hazardous waste management units in operation in or after November 1980 are regulated under the act. These units are subject to closure,[1] post-closure, and cleanup requirements. Other units at these facilities that ceased operation prior to November 1980 are not subject to closure or post-closure requirements, but owners/operators are required, under the 1984 RCRA amendments, to clean up any hazardous waste threats posed by these units.

Under RCRA, EPA imposed design and maintenance requirements—for instance, the installation of liners to prevent waste from migrating from facilities—and required owners/operators of land disposal facilities to obtain permits indicating that they met the requirements. In 1984, the Congress, concerned with the slow progress EPA had made in issuing

[1]EPA defines closure as the period during which an owner/operator of a hazardous waste facility stops using and actually closes its regulated units.

permits, amended RCRA to establish deadlines that owners/operators had to meet to apply for permits, or they were forced to close.

Under the 1984 amendments, RCRA allowed facilities to continue operating under "interim status" until November 1985, at which time owners/operators had to apply for operating permits. Facilities that applied for permits could continue to operate under interim status until the permit was granted or denied. Under interim status, owners/operators had to comply with new requirements, such as the installation of groundwater monitoring systems. Of the 1,538 land disposal facilities in existence in 1985, EPA has identified 837 that, as of November 1985, were unable or unwilling to meet the new requirements and were required to close. Until properly closed and cleaned up, these facilities continue to represent a threat to human health and the environment.

Abandoned sites and those that owners/operators cannot afford to clean up under RCRA are usually referred to the national Superfund program, which was established by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980. Should any sites not meet Superfund criteria, which are based on a facility's threat to human health, welfare, and the environment, they may have to be cleaned up under a state program, if any is available. In either event, cleanup costs are borne by the government unless the responsible parties, whose wastes contributed to the problem, can be identified and can afford to pay for the cleanup costs. The average cleanup cost of a Superfund site is about $25 million.

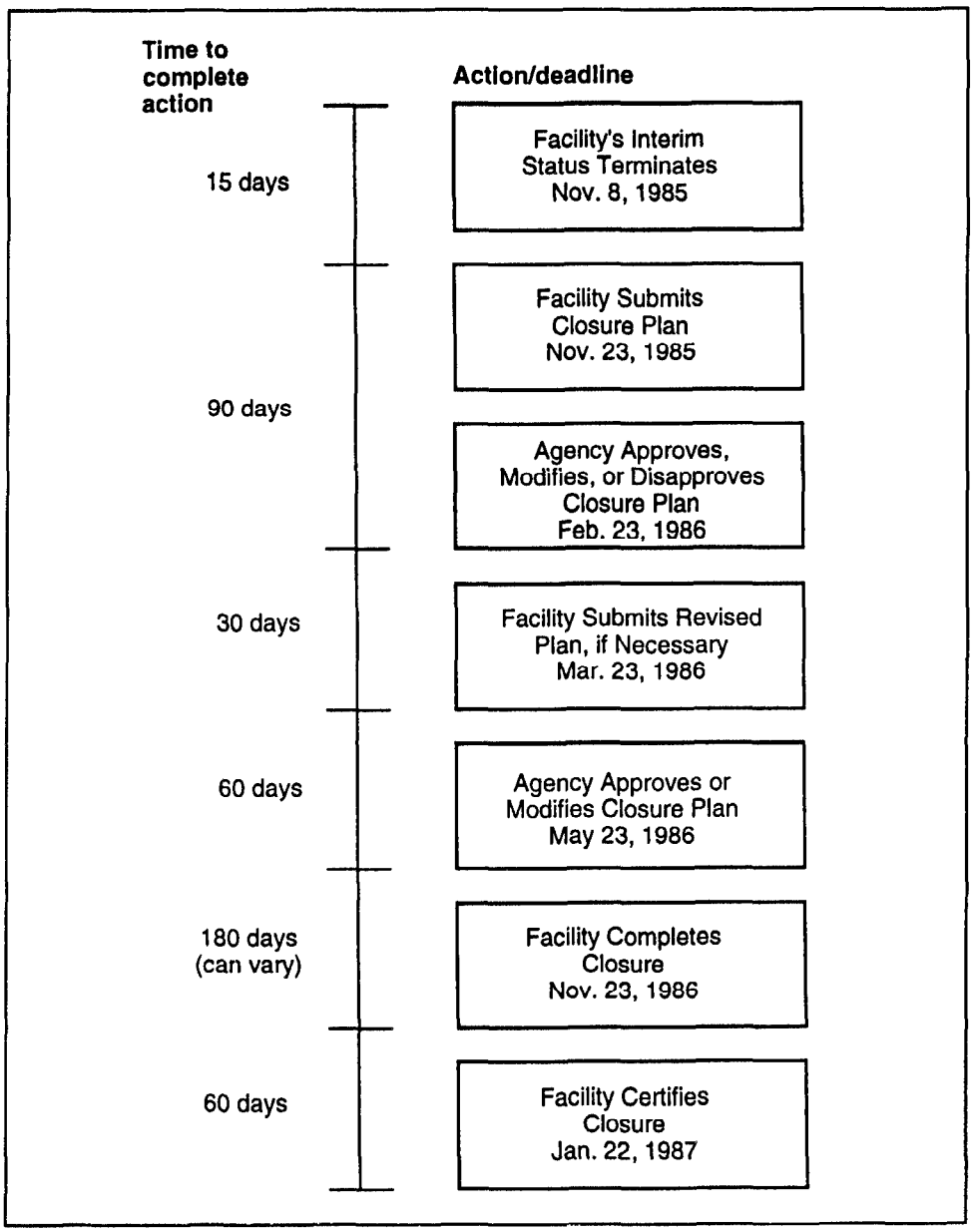
Requirements for Closing Facilities and Their Subsequent Care

Closing regulated hazardous waste management units requires either removing the hazardous waste or placing a cover over it to minimize its migration to groundwater, surface water, soil, and the atmosphere.

As shown in figure 1.1, the closure process for land disposal facilities consists of several steps, which should have been met several years ago. Facilities had 15 days following the loss of interim status to submit to EPA a closure plan and, if they were closing with waste in place, a plan for caring for the site after closure. Closure plans, which include a description of how facilities will be closed and a schedule for completion, were to be approved within 180 days of their submission, and all closure activities were to be completed within 180 days following the plans' approval. However, the regulations provided for extensions if owners/operators could successfully demonstrate that these activities required more time.

Within 60 days of completing these activities, the owner/operator and an independent professional engineer were required to certify that closure was conducted in accordance with the approved closure plan.

Figure 1.1: EPA's Timetable for Closing Land Disposal Facilities



Source: 40 C.F.R. 265.110 to 265.115.

Land disposal facilities that close their regulated waste management units with waste in place must obtain post-closure permits, which formalize the site-specific requirements for post-closure care, including groundwater monitoring and the cleanup of contamination. Before EPA issues a post-closure permit to a land disposal facility, owners/operators are required to assess the quality of the groundwater to determine whether contamination exists; what its nature and extent are; and, if necessary, what the need for any cleanup is. This assessment helps ensure that groundwater contamination is properly defined and adequately monitored and provides the basis for any additional requirements needed to maintain or clean up the facility. The post-closure permit imposes specific requirements for cleaning up the facility and caring for it after it has closed. Owners/operators must provide financial assurance that they can meet these requirements. Regulations implementing RCRA require that owners/operators monitor groundwater and maintain closed hazardous waste facilities for 30 years.

EPA's regulations required the 837 facilities that lost interim status in November 1985 to complete closure by January 1987 and to receive their post-closure permits by November 1988. In May 1991, we reported that little progress has been made in closing land disposal facilities.[2]

States' Administration of the Hazardous Waste Program

EPA has overall responsibility for implementing RCRA, including promulgating regulations, conducting inspections, and taking necessary enforcement action against owners/operators not in compliance with regulations. RCRA provides that states may be authorized to administer their own hazardous waste programs if they are at least equivalent to the federal program promulgated by EPA. Through authorization, the states are primarily responsible for implementing the act, while EPA oversees states' activities. As changes occur under RCRA, states are required to obtain EPA's authorization for additional changes to their programs. Currently, 45 states, the District of Columbia, and Guam have been authorized to administer the RCRA program. States receive federal grants under the RCRA program to carry out program responsibilities. The grant formula provides that states will contribute at least 25 percent of the funds necessary to carry out the program. However, because of the increasing universe of hazardous waste facilities and expanding responsibilities, states' contributions in many cases exceed the 25-percent minimum, with some

[2]Hazardous Waste: Limited Progress in Closing and Cleaning Up Contaminated Facilities (GAO/RCED-91-79, May 13, 1991).

states providing as much as 50 to 60 percent more than required under the grant formula.

Inspections and Enforcement Actions in Implementing RCRA

While guidelines for conducting inspections and taking enforcement actions are generally the same for both operating and closing land disposal facilities, these functions are especially critical at closing facilities to ensure that they properly close in accordance with the RCRA program's closure requirements and that the facilities receive post-closure permits, which provide for long-term care. Inspections determine if owners/operators have installed adequate groundwater monitoring systems, developed acceptable closure plans, obtained necessary financial assurances, and complied with time frames and the scope of work specified in the closure plans. If violations are detected, enforcement actions can be taken to bring the owners/operators into compliance in a timely fashion, thus minimizing any closure delays and potential environmental and health risks from noncompliance.

Inspections

Section 3007(a) of RCRA authorizes EPA or authorized states to inspect land disposal facilities for compliance with RCRA's regulatory requirements. The primary type of inspection used to determine overall compliance with RCRA's requirements is the compliance evaluation inspection. At a closing facility, the basic objective of this inspection is to ensure that EPA's closure regulations and requirements are being met. Prior to the approval of the closure plan, an inspector's role would focus on determining that the facility has a closure plan and that the plan covers all units subject to closure. The inspector would also assess whether the proposed method of closure adequately provides for the proper disposal and/or control of the waste and contamination. Once a plan is approved, an inspector would primarily be concerned with determining that the facility is complying with the terms and requirements of the closure plan. Because owners/operators of both closing and operating land disposal facilities are required to install groundwater monitoring systems capable of determining a facility's impact on the quality of the groundwater, during a compliance evaluation inspection an inspector would also check if the facility has installed the minimum number of four monitoring wells, whether the owners/operators have a plan for sampling and analyzing groundwater, and whether the plan is being followed.

EPA and the states also conduct comprehensive evaluations at operating and closing land disposal facilities to determine if the groundwater

monitoring system is capable of detecting any potential groundwater contamination and what the extent of any contamination is. These inspections include a detailed investigation of a facility's hydrogeological conditions and the engineering features of the groundwater monitoring system and an overall assessment of the system's effectiveness.

Through annual RCRA Implementation Plans, EPA establishes the frequency with which regional offices and states should conduct both compliance evaluation inspections and comprehensive evaluations. These plans identify national priorities and lay out key activities for EPA and the states to accomplish.

Enforcement Actions

Section 3008 of RCRA provides EPA the authority to take enforcement action against owners/operators who violate regulations. In 1984, EPA issued an enforcement policy that classifies violations according to the potential they have to threaten human health and the environment. The policy was later revised in December 1987. EPA's enforcement policy classifies violations into two categories, with Class I violations being the most serious. A Class I violation is a deviation from the regulations that could result in a release of hazardous waste into the environment. A Class II violation is any other violation of RCRA's requirements. For example, failing to install and operate an adequate groundwater monitoring system would be a Class I violation, whereas failing to submit a copy of a required report would be a Class II violation. EPA's policy also establishes three categories of violators—high-priority, medium-priority, and low-priority. These categories reflect the class of a facility's violation(s) and a number of other factors, such as the facility's history in complying and any previous recalcitrant behavior by the owner/operator. Time frames and appropriate enforcement actions vary, depending on the category of the violator.

EPA's enforcement policy also provides examples of groundwater, closure/post-closure, and financial responsibility violations. For example, a groundwater violation would be cited if a facility lacks a sufficient number of monitoring wells or does not comply with groundwater sampling requirements. A closure/post-closure violation would be cited if an owner/operator does not have a closure plan or has failed to follow the plan without approval. A financial responsibility violation would be cited for the failure to establish or maintain financial assurance for either closure or post-closure care.

High-priority violators represent the category of violators that merits immediate and the most stringent enforcement response. Under EPA's 1984 enforcement policy,[3] these violators are owners/operators who

- have one or more Class I groundwater, closure/post-closure, and/or financial responsibility violations;
- have facilities that pose a substantial likelihood of exposure to hazardous waste or have caused actual exposure;
- have realized a substantial economic benefit as a result of noncompliance; or
- are recalcitrant or chronic violators.

For high-priority violators, EPA's enforcement policy provides that within 135 days after an inspection, authorized states are to (1) issue an administrative order directing that specific actions be taken to correct the violations and assess a penalty or (2) refer the case to EPA, the state attorney general, or other appropriate legal authority for judicial (primarily civil) action. If the case is referred to EPA, the agency's regional office is to issue a complaint or refer the case to the U.S. Department of Justice for civil action within 90 days of receiving the referral. Once states refer a case to the attorney general or EPA refers a case to Justice, the established time frame for filing a suit is 60 days.

EPA's enforcement policy specifies that high-priority violators be penalized to recover any economic savings they may have accrued by not complying. EPA regions are to assess penalties in accordance with the agency's penalty policy, which instructs them to consider various factors such as a facility's good-faith efforts to comply, the degree of willfulness and/or negligence, the history of noncompliance, and the facility's ability to pay. Under RCRA, the maximum penalty EPA can assess violators is $25,000 per day per violation. Penalties play a key role in environmental enforcement by acting as a deterrent to violators and by ensuring that regulated entities are treated fairly and consistently, with no one gaining a competitive advantage by violating environmental regulations.

State laws and regulations provide states with the authority to issue administrative orders and assess administrative penalties. State laws also dictate which state entity has the authority to take such actions. Because some state legislatures have not given their state environmental agencies

[3]The definition of a high-priority violator was changed when EPA revised its enforcement policy in December 1987. However, the revision did not affect our analysis because most of the facilities we reviewed met the criteria for both definitions. At the remaining facilities, no enforcement actions were taken after October 1988, when the new policy became effective.

the authority to issue administrative orders or administrative penalties, violators must be referred to the state attorneys general or to EPA for enforcement action. As we have previously reported, some states have legal limits on the dollar amounts they can assess for penalties, and states do not routinely recover the economic benefit violators gain from noncompliance.[4] Iowa's state law, for example, prohibits administrative penalties of more than $1,000 per day, as compared with RCRA's cap of $25,000 per day.

EPA recommends, rather than requires, states to follow its enforcement response policy. However, EPA's policy provides instances in which the agency should take action in an authorized state, such as when the state asks EPA to do so or when the state fails to take timely action or issue an administrative order with appropriate penalties. If, for example, a state fails to issue an administrative order or refer a high-priority violator within 135 days after an inspection, the EPA regional office can take direct enforcement action after notifying the state. Only if the state has made reasonable progress in returning the facility to compliance or in processing an enforcement action should the region hold off its action when the state has not met the time frame.

Objectives, Scope, and Methodology

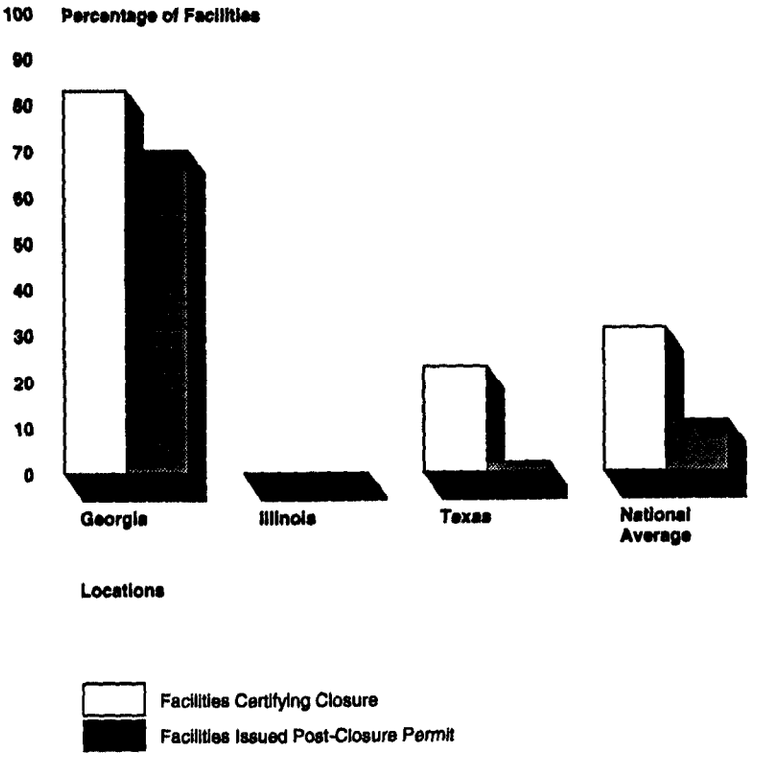
In a letter dated July 28, 1989, the Chairman of the Environment, Energy, and Natural Resources Subcommittee, House Committee on Government Operations, expressed concern regarding whether EPA is taking appropriate steps to ensure that land disposal facilities are addressed in a timely manner and asked us to examine EPA's oversight of closing land disposal facilities. In our May 1991 report, we examined EPA's progress in completing closures and issuing post-closure permits. In this report—our second in response to the Chairman's request—we examined the inspection of these facilities and enforcement actions taken against those found in violation of requirements. In addition, we identified other factors that can delay closure and the issuance of post-closure permits.

We performed our work in 3 of EPA's 10 regional offices and in one authorized state within each of these regions, as follows: Region IV, Georgia; Region V, Illinois; and Region VI, Texas. We selected these regions because they are dispersed geographically and because they contain the largest universe of closing land disposal facilities. Approximately 55 percent of the facilities that lost interim status on

[4]Environmental Enforcement: Penalties May Not Recover Economic Benefits Gained by Violators (GAO/RCED-91-166, June 17, 1991).

November 8, 1985, are located in the three regions. We selected the three states because they reflect a range of progress in their closing of facilities, as shown in figure 1.2.

Figure 1.2: Status of Closing Waste Disposal Facilities in Three States, June 1991



According to information provided by state officials, as of June 1991, the percentage of facilities in Georgia, Illinois, and Texas that had certified closure ranged from 0 to 83, and the percentage of facilities that had received their post-closure permits ranged from 0 to 70. Information provided by an EPA headquarters official showed that as of September 1991, 257, or 31 percent, of the 837 facilities nationwide had completed closure, while the remaining 580 or 69 percent, had yet to do so. In total, 89, or 11 percent, of the 837 facilities had received their post-closure permits. Although the three states reviewed are not intended to represent

conditions nationwide, they do provide significant coverage of closing land disposal facilities.

We reviewed EPA's and the states' policies and procedures, statistical reports, data on violations, oversight activities, and inspection and enforcement activities relating to closure and post-closure. We interviewed hazardous waste officials at EPA headquarters, EPA Regions IV, V, and VI, and state environmental agencies, including the Georgia Department of Natural Resources, the Illinois Environmental Protection Agency, and the Texas Water Commission. In addition, we consulted with Assistant Attorneys General within each of the three states. Most of our work was performed in the state agencies' headquarters because the three states selected have been authorized to implement the RCRA regulatory program.

We also reviewed inspection and enforcement data from EPA's Hazardous Waste Data Management System for facilities that lost interim status on November 8, 1985. Our review included 20 facilities—6 facilities in Georgia, 6 in Illinois, and 8 in Texas. We used EPA's data system to identify facilities in different stages of closure so that we could examine the extent of, and reasons for, delays in the entire process. Our review included facilities for which

- no closure plan was submitted;
- a closure plan was submitted, but not yet approved by the state or EPA;
- a closure plan was approved, but closure had not been certified;
- closure was certified, but no post-closure permit was issued by the state or EPA; and
- closure was certified and a post-closure permit was issued.

We reviewed EPA's RCRA Implementation Plans and inspection data from EPA's data system to analyze the timeliness of inspections from October 1985 to September 1990. To evaluate the timeliness and appropriateness of enforcement actions, we used EPA's data system to identify the states' and EPA's enforcement actions taken for high-priority violators over the same time period. We reviewed actions taken against these violators because EPA believes they merit immediate and the most stringent enforcement response. To verify the accuracy of EPA's data and to gain information about the status of each facility's post-closure permit, we reviewed inspection, enforcement, and permit files for each facility.

We conducted our review between October 1990 and February 1992 in accordance with generally accepted government auditing standards except that we did not verify EPA's data bases or internal controls because doing so was not critical for meeting our objectives. We discussed the factual information presented in our report with EPA Office of Solid Waste and Emergency Response officials. They generally agreed that the information as presented is correct, and their comments were incorporated where appropriate. As requested, however, we did not obtain written comments on this report.

Inspection and Enforcement Efforts Have Had Limited Success in Closing Facilities

In our review of three states, we found that they generally followed EPA's inspection guidelines, but neither the states nor EPA fully conformed with EPA's enforcement policy. The states varied in terms of their conformance with EPA's policy. One state more closely adhered to the policy of taking formal actions with penalties or referring cases to EPA or state attorneys general, while another state routinely relied on informal enforcement actions with no penalties. The success states have had in closing facilities, however, has depended less on the type of enforcement action taken for closure violations than on the states' success in ensuring that facilities install adequate groundwater monitoring systems, which are necessary for certifying closure. Once these costly systems are installed, states may be more likely to close facilities regardless of the type of enforcement action taken for other violations.

During a 5-year period, the states conducted compliance inspections annually, as directed by EPA, 96 percent of the time at the 20 facilities we reviewed. Similarly, the states conducted inspections on the adequacy of groundwater monitoring systems every 3 years, as directed by EPA, 89 percent of the time. However, while the inspections have revealed serious violations that delayed closure and the issuance of post-closure permits, EPA has recently relaxed its guidelines for compliance inspections and has eliminated any specific provision for conducting groundwater monitoring inspections. An EPA official stated that these changes were made because of resource constraints and that the changes provide states more discretion in determining which facilities should be inspected.

In our review, when inspections were conducted and violations were detected, neither the states nor EPA consistently followed the agency's enforcement policy. The policy directs states to issue facility owners/operators an administrative order and a penalty or refer the violator to EPA or the state attorney general within 135 days. The states took action within 135 days in 96 percent of the enforcement cases we reviewed, but only 16 percent of the states' actions complied with EPA's policy of issuing administrative orders with penalties or referring cases for enforcement action. Instead, the states typically sent informal notices of violation either because their policies or statutes provide that they attempt to obtain compliance through informal action or because the state environmental agency lacks the authority to issue enforcement orders with penalties. The states did, at times, follow up their informal notices with administrative orders when facility owners/operators did not comply. When the states did not comply with EPA's enforcement policy or when they referred cases to EPA for enforcement, the agency also did not follow

the policy by taking independent action against facility owners/operators. EPA officials stated that the policy is not always adhered to because they do not want to spend several months duplicating case preparation work already performed by the states or because the regions want to maintain good working relations with the states.

While inspection and enforcement efforts are necessary to ensure that closing land disposal facilities comply with RCRA's closure and post-closure requirements, the absence of an adequate groundwater monitoring system can significantly limit the effectiveness of these efforts in ultimately closing facilities. Regardless of the number of inspections conducted and the type of enforcement actions taken, facilities cannot close or receive a post-closure permit until they satisfy requirements for groundwater monitoring systems. These systems are necessary to fully evaluate the environmental and health risks posed by facilities. These systems are also costly to install. We found the success the states have had in closing facilities and issuing post-closure permits is more closely related to the states' success in having facilities install groundwater monitoring systems than to the type of enforcement actions taken.

Relaxed Inspection Guidelines May Delay Closure and Issuance of Post-Closure Permits

RCRA, as amended, requires that land disposal facilities be inspected to determine their compliance with the act's requirements at least every 2 years. The compliance evaluation inspection is used to fulfill this requirement. From October 1985 to September 1990, EPA's annual RCRA Implementation Plans, which provide inspection guidelines, directed that these inspections be conducted annually. A more frequent inspection schedule than the minimum required by RCRA was adopted, according to EPA's Technical Assistance and Training Branch Chief, because of EPA's emphasis on ensuring that owners/operators install at least four groundwater monitoring wells and follow plans for monitoring groundwater quality. During the 5-year period, the three states conducted 103 compliance evaluation inspections at the 20 facilities included in our review.

While RCRA does not require groundwater monitoring inspections, which specifically assess the adequacy of a system's ability to detect and define the extent of any groundwater contamination, annual implementation plans directed that these inspections be conducted at one-third of the land disposal facilities each year between 1985 and 1990. EPA's Technical Assistance and Training Branch Chief said that the agency called for these specialized inspections because of its concern over the adequacy of

systems installed to detect groundwater contamination. The Chief also said that EPA called for these inspections on a triennial basis because it believed that this frequency was sufficient during a period when obtaining compliance with groundwater monitoring requirements was among the agency's highest priorities. During the 5-year period, the three states conducted 45 groundwater monitoring inspections at the 20 facilities included in our review.

We found that the three states generally followed the inspection guidance for annual compliance inspections. As shown in table 2.1, 96 percent of the inspections were performed annually as required during the 5-year period. While 100 percent of the inspections conducted in Illinois met EPA's time frames, over 90 percent of the inspections in Georgia and Texas did so.

Table 2.1: Timeliness of States' Compliance Inspections, Fiscal Years 1986-90

	Percentage of inspections that were timely, by fiscal year					
State	1986	1987	1988	1989	1990	Overall
Georgia	83	83	100	100	100	93
Illinois	100	100	100	100	100	100
Texas	88	100	100	100	88	95
Overall average	90	95	100	100	95	96

Source: GAO's analysis of information from EPA's Hazardous Waste Data Management System and states' files on the facilities.

The states' conformance with the requirement for conducting triennial groundwater monitoring inspections is shown in table 2.2. The states conducted 45 groundwater monitoring inspections between October 1985 and September 1990 at the 20 facilities included in our review. Overall, 89 percent of the inspections met EPA's 3-year time frame. However, Georgia and Illinois were more successful in meeting the time frame than Texas.

Table 2.2: Timeliness of States' Groundwater Monitoring Inspections, Fiscal Years 1986-90

State	Percentage of inspections that were timely
Georgia	90
Illinois	100
Texas	33

Source: GAO's analysis of EPA's Hazardous Waste Data Management System and states' files on facilities.

Texas Water Commission officials provided various reasons why groundwater monitoring inspections were not always conducted every 3 years. According to the head of the Groundwater Enforcement Unit, inspections are not conducted at facilities that have no groundwater monitoring systems in place because it is not possible to determine the adequacy of a system when none exists. Of the eight facilities reviewed in Texas, three have no groundwater monitoring systems. The Director of Programs and Chief of Field Support Services said that staff attrition and funding shortages have also affected the agency's ability to conduct inspections at those facilities having groundwater monitoring systems. For example, he told us that the state had to reduce the number of groundwater monitoring inspections planned for fiscal year 1992 by almost one-third after the Commission's funding for the year was finalized.

In contrast, 100 percent of Illinois' groundwater monitoring inspections at the six facilities were conducted on a triennial basis between fiscal years 1986 and 1990. Illinois conducted these evaluations at facilities both with and without groundwater monitoring systems in place. Of the six facilities reviewed in Illinois, two have no groundwater monitoring system. According to Illinois EPA's Chief, Field Operations Section, groundwater monitoring inspections were conducted at these facilities to determine if the owners/operators had made any progress in installing a system.

Georgia generally met EPA's guidelines for conducting triennial groundwater inspections. At the six facilities reviewed in that state, 90 percent of the groundwater monitoring inspections were conducted every 3 years. All six of the facilities reviewed in Georgia have installed groundwater monitoring systems.

While the states' performance in conducting inspections has generally met EPA's guidelines, the agency has recently revised its time frames for conducting compliance and groundwater monitoring inspections. EPA's fiscal year 1991 RCRA Implementation Plan no longer directs states to conduct compliance inspections at all land disposal facilities annually. Instead, it directs that compliance inspections be conducted annually only at those facilities that have outstanding Class I violations and that were not inspected the previous fiscal year. In addition, EPA's fiscal year 1992 RCRA Implementation Plan eliminates the provision for conducting any groundwater monitoring inspections. EPA's Technical Assistance and Training Branch Chief said that the agency made the changes because of resource constraints at both the federal and state levels and that the changes, in effect, give regions and states discretion to determine when

inspections should be conducted. However, these revisions may allow violations to go undetected for longer periods of time, thus increasing potential health and environmental risks and possibly delaying closing and the issuance of post-closure permits.

Closing Facilities Have Numerous Violations

Inspections at the facilities we reviewed identified violations that have delayed the closing of facilities and issuance of post-closure permits. Of the 20 facilities, 19 have had violations serious enough to be classified as Class I violations of requirements concerning groundwater monitoring, closure/post-closure, or financial assurance. Of the 19 facilities, 16 still have outstanding violations of at least one set of requirements. This situation is comparable to the situation nationwide. As of September 1991, 737, or 88 percent, of the 837 closing facilities had one or more outstanding Class I violations in at least one of those three categories. Of the 837 facilities, 77 percent had groundwater violations, 67 percent had closure/post-closure violations, and 65 percent had financial responsibility violations.

We were unable to determine the exact number of Class I violations per category at each of the 19 facilities because of the limited information contained in EPA's data system. The data system only indicates if a facility has at least one outstanding violation per category. For example, the system may show a facility has an outstanding Class I closure/post-closure violation, but it does not specify whether the facility has one or more closure/post-closure violations. However, we were able to determine how many of the high-priority violators we reviewed had groundwater, closure/post-closure, and financial responsibility violations over a 5-year period. Of the 19 facilities, 15 had Class I groundwater violations, 14 had Class I closure/post-closure violations, and 18 had Class I financial responsibility violations.

According to EPA and state hazardous waste officials, the impact a violation can have on delaying closing or the issuance of post-closure permits varies depending on the type of violation involved. Closure/post-closure violations, such as not submitting a closure plan within 15 days, can delay but not necessarily prevent a facility from certifying closure. Financial responsibility violations also may not prevent certifying closure because some financial requirements, such as the need for third-party liability coverage, cease to apply when facilities close.

Certain groundwater violations, such as the failure to install a groundwater monitoring system, can, however, prevent a facility from certifying closure and receiving its post-closure permit. Of the 20 facilities we reviewed, 9 either have no groundwater monitoring system in place or have yet to have their systems approved. Of these nine, eight have outstanding Class I groundwater violations. The ninth facility also has no groundwater monitoring system but, according to an Illinois environmental agency attorney, is appealing the requirement to install one. In the interim, the facility's violation is pending.

EPA's Enforcement Policy Not Being Implemented as Intended

Although inspections were identifying noncompliance over the 5-year period, the three states and EPA were not following EPA's enforcement policy. The policy does not require adherence by states or EPA regional offices, as the agency has not formalized the policy by incorporating it into regulations. This has resulted in different practices by state and regional offices. For example, we found that states, rather than issuing administrative orders with penalties or referring cases to EPA or state attorneys general within 135 days following an inspection, are often issuing informal notices of violation. EPA, rather than taking independent action when states do not conform with the enforcement policy, has frequently chosen to take no action. In addition, when violators are referred by states to EPA, the agency is not always issuing administrative orders with penalties or referring cases to the Department of Justice within 90 days.

Even though states issued informal notices of violation rather than administrative orders with penalties, states did, in some instances, subsequently issue administrative orders or refer cases if facilities did not return to compliance. States are not fully complying with EPA's enforcement policy because informal actions, which require that owners/operators discuss alleged violations with state officials, allow the officials the opportunity to confirm the accuracy of information contained in the inspection report and to negotiate prior to taking any formal action. In addition, one state environmental agency does not have the authority to issue administrative orders or assess administrative penalties. EPA is not complying with its enforcement policy because, among other reasons, doing so may, at times, result in the agency's duplicating case preparation work that has already been performed by the states.

States Not Conforming With EPA's Enforcement Policy

The states' conformance with EPA's enforcement guidance for high-priority violators is shown in table 2.3. From October 1985 to September 1990, the states initiated 55 enforcement actions in response to Class I violations detected at 19 of the 20 facilities. Of these 55 actions, 53, or 96 percent, were taken within 135 days. In nine of these cases, states adhered to EPA's policy by issuing four administrative orders with penalties and referring the other five cases to EPA regional offices for enforcement action. The states did not refer any of the violators to the state attorneys general. States issued administrative orders without penalties or sent informal notices of violation in the remaining 46 high-priority cases. While almost all of the states' initial enforcement actions were informal, states did, at times, follow up with formal actions. Five of the 45 informal actions taken were subsequently followed up with administrative orders with penalties.

Table 2.3: States' Conformance With EPA's Enforcement Guidance for High-Priority Violators, Fiscal Years 1986-90

				Total	
Enforcement action	**Georgia**	**Illinois**	**Texas**	**Number**	**Percent**
Total actions	10	35	10	55	100
Timely actions	10	35	8	53	96
Appropriate actions	1	3	5	9	16
Order with penalty	1	0	3	4	
Referral to EPA	0	3	2	5	
Referral to attorney general	0	0	0	0	
Inappropriate actions	9	32	5	46	84
Order without a penalty	1	0	0	1	
Informal notice	8	32	5	45	

Source: GAO's analysis of information from EPA's Hazardous Waste Data Management System and EPA regions' and states' files on facilities.

Between October 1985 and September 1990, Georgia initiated 10 enforcement actions against the 5 high-priority violators reviewed in that state. Georgia initiated all 10 actions within 135 days but took informal action in 8 cases by issuing notices of violation, rather than administrative orders with penalties. Georgia hazardous waste officials said that under state law, they attempt to return violators to compliance through issuing informal actions rather than administrative orders with penalties.[1] However, the officials said they will take additional actions when warranted. For example, Georgia has successfully taken one facility that

[1]The Georgia Hazardous Waste Management Act, section 12-8-71, calls for the state environmental agency to attempt to remedy a violation by conference, conciliation, and persuasion and, if these means fail, to issue an order to the violator.

refused to comply with financial responsibility requirements to the state supreme court after a circuit court decided in the facility's favor. Of the eight informal actions we reviewed, only one was subsequently followed by an administrative order and penalty.

While Georgia has not fully complied with EPA's enforcement policy, as of June 1991 the state had been successful in closing facilities and issuing post-closure permits. All six land disposal facilities reviewed in that state had certified closure, and all had been issued post-closure permits. Of the state's 23 closing facilities, 19 had certified closure and 16 had received post-closure permits. This success may be attributed, in part, to the state's ability to ensure that all 23 of the closing facilities installed adequate groundwater monitoring systems, which are critical for both closure and the issuance of post-closure permits.

Texas initiated 10 enforcement actions against the 8 facilities reviewed in that state. Of those actions, eight were taken within EPA's time frame of 135 days. Half of the actions taken were appropriate because the state either issued an enforcement order with a penalty or it referred the case to EPA for enforcement. However, the remaining five actions were informal notices of violation. According to a Texas enforcement official, the state will often issue informal notices of violation in order to meet with owners/operators and verify information contained in the inspection report regarding alleged violations. Once facts are verified, the state issues enforcement orders to all high-priority violators. In three of the five instances in which the state initially issued informal notices, it subsequently issued formal enforcement orders.

Even though Texas conformed more closely with EPA's enforcement policy than Georgia, Texas' failure to ensure that closing facilities installed adequate groundwater monitoring systems may have hampered the state's progress. Half of the state's 52 closing facilities do not have approved groundwater monitoring systems in place. Of the eight facilities reviewed in that state, three have certified closure, and one has received a post-closure permit. Statewide, 12 facilities have certified closure, and 1 has received its post-closure permit. According to the head of the Groundwater Enforcement Unit, the state has not developed a strategy, other than taking routine enforcement actions, for ensuring that adequate groundwater monitoring systems are installed at closing facilities. She said that closing facilities have no incentive to install the systems.

Illinois took action 35 times in response to violations detected at the six facilities reviewed. This number is significantly higher than the number of actions taken by Texas and Georgia against their 13 high-priority violators. This is because Illinois generally sends owners/operators an informal notice of violation each time a violation is detected, regardless of whether the violation has been detected in a previous inspection and has already been referred to EPA or the state attorney general for enforcement action. Of the 35 actions Illinois took, 3 were referrals to EPA, while the remainder were informal notices of violation. All were taken within 135 days. According to state enforcement officials, the state agency issues informal notices of violation because the agency does not have the authority to issue enforcement orders with penalties. Because of the quality of data in EPA's data system and the state's files, we were unable to determine how many of the 32 informal notices were subsequently followed up by either referrals to EPA or to the state attorney general.

Illinois was the least effective of the three state programs reviewed in closing its land disposal facilities. None of the 22 closing facilities in that state, which include the 6 we reviewed, has certified closure or received a post-closure permit. As with Texas, this lack of progress may be attributed, in part, to the fact that most of the closing facilities do not have approved groundwater monitoring systems in place. An Illinois official, who manages the state's Groundwater Unit, said that the state has no plan, other than taking enforcement actions, to address closing facilities that have not installed adequate groundwater monitoring systems. He said that the state's strategy at operating facilities is to make the installation of the systems a requirement for obtaining an operating permit. However, closing facilities do not have such an incentive for installing the systems, and the state has no leverage to ensure that they are installed.

Illinois' lack of success may also be linked to the state environmental agency's inability to issue administrative orders and assess administrative penalties. For the state to issue an administrative order and penalty, the state attorney general must refer the case to an independent Pollution Control Board, which reviews it and decides if an administrative order with a penalty is warranted. According to Illinois program enforcement officials, this process is inefficient and delays enforcement. In addition, when owners/operators independently bring issues before the board, EPA sometimes delays taking enforcement action.

As we noted in a June 1988 report,[2] as early as 1984, EPA considered changing its regulations to require that state environmental agencies have the authority to issue administrative orders and penalties in order for the states to be authorized to implement RCRA. The agency believes that state regulatory agencies should have this authority to reduce their dependence on EPA and state attorneys general to take enforcement actions. The agency also believes that the state environmental agencies will be able to achieve a higher degree of compliance using limited resources if they have the ability to impose penalties. Although the agency has since drafted revisions to its regulations that would require states to be able to take timely and appropriate action as a condition for authorization, the revisions have been at the Office of Management and Budget for review since October 1990. The proposed revisions do not, however, incorporate EPA's enforcement policy or otherwise require that states take timely and appropriate action.

EPA Regions Not Conforming With EPA's Enforcement Policy

When the states failed to take timely and appropriate action, the three EPA regional offices did not generally follow EPA's enforcement policy by either taking independent action against owners/operators or by acting appropriately on state referrals within 90 days. In none of the instances in which states failed to take timely and/or appropriate action did EPA issue an administrative order and penalty within 135 days. Of the seven enforcement cases referred by the states to EPA regions for enforcement,[3] only three were acted upon appropriately, and two of these actions exceeded the 90-day time frame.

EPA regional officials provided various reasons for not taking independent enforcement action when states failed to take timely and appropriate action. The RCRA Enforcement Branch Chief in EPA Region VI said that the region has not taken independent enforcement action when Texas has failed to comply with EPA's enforcement policy because the region believes the state is making reasonable progress. He told us that Texas has a very large enforcement caseload and that the state issued more enforcement actions than in any other state in the country in 1989 and 1990. He also said that taking independent action would require a regional office staff member to independently verify information about the violator in order to

[2]Hazardous Waste: Many Enforcement Actions Do Not Meet EPA Standards (GAO/RCED-88-140, June 8, 1988).

[3]This number is different from the number of referrals to EPA shown in table 2.3 because in considering the timeliness of actions for the table, we excluded two referrals to EPA. One was made after the state took informal action within 135 days, and for another, there was insufficient information to allow us to determine when the case should have been referred to EPA.

become knowledgeable enough about the case to serve as a credible witness in any potential administrative hearing. Thus, it is generally more expedient to grant a state additional time rather than expend several months developing an enforcement case. In Region V, the Associate Division Director of the Office of RCRA/Waste Management Division said that the region is concerned about maintaining a reasonably good working relationship with the states, so the region tends to pursue enforcement actions only when the states refer a case to the region.

In addition, we have previously reported that, according to both EPA headquarters and regional office officials, various pressures and different views prevail within EPA regions—sometimes deterring them from following the agency's penalty policy and recovering economic benefits gained by violators.[4] Some regional and program officials strongly endorse EPA's penalty policy and aim to carry it out. Others, however, choose to de-emphasize penalties in favor of working with violators to obtain compliance because of a belief that this approach will bring a large number of facilities back into compliance.

Table 2.4 shows EPA's actions for the seven cases referred by the states. In cases for which EPA's action was neither timely nor appropriate, the agency issued informal notices of violation, issued administrative orders without penalties, or referred cases back to the state with no action.

Table 2.4: EPA Regions' Enforcement Actions in Response to State Referrals, Fiscal Years 1986-90

	Region IV	Region V	Region VI	Total
Number of referrals	0	4	3	**7**
Number of timely actions	[a]	1	0	**1**
Number of appropriate actions	[a]	2	1	**3**
Order with penalty	[a]	1	1	**2**
Referral to Justice	[a]	1	0	**1**

[a]Not applicable.

Source: GAO's analysis of information from EPA's Hazardous Waste Data Management System and EPA regions' and states' files on facilities.

Illinois referred four enforcement cases to EPA Region V. The regional office issued an administrative order with a penalty in one case and referred a second to the Department of Justice, but met EPA's 90-day time frame in only one of the cases. EPA did not issue administrative orders with

[4]Environmental Enforcement: Penalties May Not Recover Economic Benefits Gained by Violators (GAO/RCED-91-166, June 17, 1991).

penalties in the remaining two cases. According to Region V's RCRA Enforcement Branch Chief, in one instance, the region had argued strongly for a $67,000 penalty, but the federal administrative law judge declined to assess it because he believed the facility could not afford to pay it. In the second case, the Chief said the region did not issue an enforcement order with a penalty because the facility's owners/operators were already complying with the requirements of another order, which resulted in the facility's conducting extensive groundwater monitoring. As a result, the region took informal action.

Texas referred three cases to Region VI for enforcement action. The regional office issued an administrative order with a penalty in one case, but exceeded the 90-day time frame by 85 days. The region took no enforcement action in the other two cases. In both instances, EPA referred the case back to the state for enforcement after significant delays. In one of these instances, EPA took 14 months to refer the case back to the state. This particular facility had contaminated groundwater and lacked financial assurance. Prior to referring the case to EPA, the state had tried, unsuccessfully, for over 3 years to require the owners/operators to correct these problems. According to an EPA Region VI enforcement official, EPA declined to make a decision on this case for 14 months because the agency considered the case less of an environmental threat than other cases. EPA ultimately referred the case back to the state because the agency believed the state had more enforcement options at its disposal. In the second case, Region VI's Texas Section Chief told us he was unable to determine why the case against the facility, which had Class I groundwater and financial responsibility violations, was returned to the state for enforcement action. However, a state enforcement official said the state asked EPA to return the case so the state could take more timely enforcement action.

Lack of Adequate Groundwater Monitoring Is a Key Factor Delaying Closure and Post-Closure

The absence of adequate groundwater monitoring systems may significantly limit the effectiveness of states' inspection and enforcement efforts in ultimately closing facilities and issuing permits for post-closure care. Regardless of the number of inspections conducted and the type of enforcement actions taken, facilities cannot close or receive a post-closure permit until they satisfy requirements for groundwater monitoring systems. However, EPA does not keep track of how many closing land disposal facilities are lacking groundwater monitoring systems even though they are critical in completing closure and obtaining a post-closure permit.

A groundwater monitoring system detects any existing groundwater contamination at the site and serves as an early warning system to detect any contamination leaving the site. Such contamination may pose potential health and environmental risks. A monitoring system is necessary to make decisions about a facility's intent or attempt to remove waste rather than contain it because a facility cannot meet removal standards if groundwater contamination is present. Before EPA can issue a post-closure permit to a land disposal facility, owner/operators must assess the groundwater conditions at the site to determine whether contamination exists, what its nature and extent are, and what the need for any cleanup is. The assessment provides the basis for specific groundwater and cleanup requirements included in the post-closure permit. However, if an adequate groundwater monitoring system is not in place, such an assessment cannot be conducted.

Despite the essentialness of adequate groundwater monitoring systems, EPA's Chief of the Monitoring and Technology Section said the agency has not determined how many closing facilities nationwide do not have them and has no plans to obtain this information for closing facilities. Office of Solid Waste officials informed us that EPA has ranked closing land disposal facilities on the basis of their overall risk in comparison to other hazardous waste facilities. Although many of the closing land disposal facilities do not have adequate groundwater monitoring systems, EPA uses information from RCRA facility assessments and investigations to determine a facility's potential threat. However, the officials acknowledged that without an adequate groundwater monitoring system in place, they do not have complete knowledge of this threat. In addition, they also acknowledged that if facilities are not covered and the groundwater is not monitored, cleanup costs could increase because contamination may continue to spread unchecked.

The percentage of facilities with adequate groundwater monitoring systems varied widely among the three states we visited. Although land disposal facilities were to have groundwater monitoring systems in place as early as November 1981, only one of the states we visited has been successful in attaining compliance with this requirement, according to information provided by state officials (see table 2.5).

Table 2.5: Groundwater Monitoring at Closing Facilities, June 1991

	Georgia		Illinois		Texas	
Status of facilities	**No.**	**Percent**	**No.**	**Percent**	**No.**	**Percent**
Total facilities	23	100	22	100	52	100
System approved	23	100	5	23	23	44
System installed but not approved	0	0	9	41	8	15
No system	0	0	4	18	18	35
Other[a]	0	0	4	18	3	6
Closure certified	19	83	0	0	12	23
Post-closure permit issued	16	70	0	0	1	2

[a]"Other" includes facilities that removed waste and did not install approved groundwater monitoring systems and facilities for which we had insufficient information to make a determination.

Source: Georgia Environmental Protection Division, Illinois Environmental Protection Agency, and Texas Water Commission officials.

Several factors were instrumental in Georgia's success in ensuring that groundwater monitoring systems were installed at closing land disposal facilities. According to a Georgia hazardous waste official, the state notified owners/operators that these systems had to be installed when the 1981 requirement became effective, and most owners/operators complied. The remaining facilities installed the systems in 1985 as a result of 1984 amendments to RCRA that established November 1988 as the deadline for land disposal facilities to have permits. The Georgia official said that unlike other states, his state interpreted the deadline to apply to post-closure permits as well as operating permits. To meet the 1988 deadline, Georgia sent all land disposal facility owners/operators a letter explaining how they would be affected by the 1984 amendments and informing them that all permit applications would be requested no later than November 8, 1985. According to the official, the remaining facilities installed groundwater monitoring systems because groundwater monitoring data were required to complete the permit applications. As a result, by November 1985, all of the closing facilities had installed adequate groundwater monitoring systems.

In contrast, facilities in the other two states have not all installed adequate groundwater monitoring systems. Officials in both states informed us that they interpreted the November 1988 deadline to apply only to operating facilities. Therefore, they focused their resources on requesting applications only from those facilities seeking operating permits and then processing those permits. Although both states have taken enforcement actions against closing facilities that lack adequate groundwater

monitoring systems, these actions have had limited success. This is because numerous factors, such as the cost of installing the systems and a lack of incentives, have hampered states' efforts to convince facility owner/operators to install the systems. These factors are discussed further in chapter 3 of this report.

Conclusions

While states have generally followed EPA's inspection guidelines and detected numerous violations at closing facilities, the agency has relaxed time frames for both compliance and groundwater monitoring inspections because of resource constraints. EPA's former inspection guidance provided for annual compliance inspections at closing land disposal facilities to ensure that facilities comply with closure and minimum groundwater monitoring requirements. However, current guidance no longer provides for an annual inspection if a facility was inspected the previous fiscal year and has no outstanding violations. Therefore, violations that may delay or prevent closure could go undetected for longer periods of time. EPA's former inspection guidance also instructed states to conduct groundwater monitoring inspections every 3 years to ensure that monitoring systems installed at facilities can adequately characterize the nature and extent of any groundwater contamination. However, current guidance provides no established time frame for these inspections. The failure to install a groundwater monitoring system can prevent a facility from certifying closure and receiving a post-closure permit. Furthermore, the failure to have a system or one that can fully characterize the nature and extent of contamination results in a lack of information on the risks closing land disposal facilities pose to humans and the environment.

Of the 20 facilities we reviewed, 8 have outstanding Class I groundwater violations, and 5 have no groundwater monitoring systems. Nationwide, 77 percent of the 837 closing land disposal facilities have outstanding Class I groundwater violations, yet EPA does not have data on the number of these that have no groundwater monitoring systems or that have inadequate systems. In addition, it has no plans to obtain this information. In view of the large number of closing facilities that have outstanding Class I groundwater violations, routine groundwater monitoring inspections appear warranted to ensure that the systems, once installed, can adequately characterize the nature and extent of any contamination. Without this knowledge, determinations cannot be made on the extent to which facilities pose a serious health and environmental risk requiring cleanup.

The three states generally met EPA's enforcement time frames by taking action against high-priority violators within 135 days. States are not required to comply with EPA's time frames, however, and they rarely issued administrative orders with penalties or referred cases to EPA within 135 days. Because of state policy or a lack of authority, states took informal actions, which were, in some instances, followed by administrative orders or referrals to EPA. Informal actions do not necessarily lead to delays in closing facilities and issuing post-closure permits if facilities have installed adequate groundwater monitoring systems and states use formal enforcement actions when informal actions do not return facilities to compliance. Georgia typically takes informal action, but has closed more facilities than Texas, which more closely conforms with EPA's policy. Illinois, however, lacks the authority to take effective action if the state's informal actions do not lead to compliance. This is because the state agency does not have the authority to issue administrative orders and penalties. None of the facilities in Illinois has closed.

In addition, EPA has not followed its own enforcement policy. The agency did not initiate independent enforcement action in those cases when states failed to take timely and appropriate action because of the agency's belief that states were making progress and because of its desire to maintain reasonably good working relationships with the states. EPA also did not issue enforcement orders with penalties or send cases to the Department of Justice within 90 days after receiving referrals from states. While we endorse EPA's enforcement policy for high-priority violators and believe that enforcement orders with penalties should be initiated in a timely manner, we recognize that states and EPA regional offices may not always find it prudent or have the ability to follow these guidelines. Conflicting state policies, a state agency's lack of authority, and facility-specific factors do result in the need for some flexibility.

While EPA is considering revising its regulations and requiring states to have the ability to take timely and appropriate enforcement action as a condition for authorization, the agency has yet to adopt this revision. Regardless of any adjustments that EPA makes to its enforcement policy, a more immediate factor deserving consideration is the importance of having adequate groundwater monitoring systems in place at closing land disposal facilities.

Recommendations

GAO recommends that the EPA Administrator direct EPA regions and the states to

- obtain and maintain data on the status of closing land disposal facilities' groundwater monitoring systems and on barriers delaying or preventing their installation, as well as develop a plan to address these barriers in a timely fashion so that closure can be completed;
- give a higher priority to closing land disposal facilities by annually conducting compliance inspections at these facilities, thereby ensuring that facilities do not have any violations that would significantly delay or prevent closure; and
- reinstate the requirement that groundwater monitoring inspections be conducted at least every 3 years at closing land disposal facilities once basic monitoring systems are installed to ensure that the systems are capable of providing necessary and basic information on the extent to which these facilities pose a threat to human health and the environment and require cleaning up.

A Number of Impediments Significantly Delay or Prevent Proper Closing of Facilities

Not only can the lack of adequate groundwater monitoring significantly delay the closure process at land disposal facilities, but other factors outside the scope of EPA's enforcement policy can as well. EPA's policy only provides the time frame for taking an enforcement action and the type of action that should be taken once a violation is detected. The policy does not address delays that are inherent in providing facilities opportunities to negotiate and appeal enforcement actions. The policy also does not address delays that result when facilities attempt to remove waste, rather than contain it. Furthermore, the policy does not prevent or minimize delays that occur in issuing post-closure permits because EPA has no guidance on when states should request permit applications.

The underlying reasons for delays include the high cost of complying with closure and post-closure requirements and the lack of incentives owners/operators have to comply. Ultimately, there will be owners/operators who cannot or will not properly close their facilities, yet EPA has no plan to identify and address these facilities. In the interim, many of these facilities may continue to contaminate groundwater, thus threatening human health and the environment.

Activities After Initial Enforcement Actions Lead to Delays

Delays in taking initial enforcement actions against facilities found in violation may be minor in comparison to subsequent delays that occur when facilities contest the action. Negotiations and administrative hearings can delay the closing of facilities and issuance of post-closure permits by years. Negotiations can stretch out because EPA has not established guidelines for how long they should last. EPA has also not established guidelines for timely conducting hearings and reaching decisions in those hearings.

Negotiation Process

EPA has not established time frames for settling disagreements with owners/operators after administrative orders have been issued even though the lack of such time frames may significantly delay the closure process. At an Illinois facility we reviewed, EPA Region V took initial enforcement action on July 15, 1986, but the order did not become final until 987 days later because of lengthy negotiations with the facility owners/operators. Negotiations were lengthy because EPA had taken another separate enforcement action against the facility on August 4, 1987, for additional violations observed during a subsequent compliance inspection and had proposed penalties for violations detected in that inspection. Following the August 1987 enforcement order, EPA made two

offers to reduce the penalties, but the facility rejected both of EPA's offers before agreeing to a negotiated penalty. The order, which covered violations detected in both enforcement actions, became final on March 28, 1989.

In a 1990 study, EPA found that it took EPA regions and states an average of 1.3 years to issue the initial formal enforcement actions and another 1.5 years to negotiate and issue the final formal actions against facilities. EPA's Enforcement Policy and Regional Operations Branch Chief said that the agency has requested its regions to comment on the need to limit negotiation time frames, but does not, at present, intend to establish rigid time frames for the negotiation process. According to the Chief, EPA believes that its negotiators should determine negotiation time frames on the basis of the specific circumstances in each case. While we agree that some cases may justify more prolonged negotiations than others, we believe that establishing basic time frames would provide EPA and the states guidance on when negotiations should be curtailed and final orders issued. Time frames are also an important management tool for evaluating progress in resolving enforcement matters.

Administrative Hearing Process

EPA has found that strains on the administrative hearing process are, in some cases, delaying facilities from returning to compliance. The complexity of RCRA cases, the significant caseload carried by administrative law judges, and delays inherent in affording due process can contribute to delays in obtaining timely administrative hearing decisions. Hearings are often postponed to allow facilities and regulatory agencies an opportunity to negotiate, and judges' decisions may come years after hearings are concluded.

Once EPA regions issue an administrative order, facility owners/operators have 30 days to request a hearing. If no hearing is requested, an order becomes final 30 days after being issued. At the state level, time frames for requesting a hearing vary. If facility owners/operators request a hearing, an adjudicatory hearing before a presiding officer is scheduled. Presiding officers are EPA administrative law judges or state environmental agency employees who preside over and decide cases. According to EPA's Chief Administrative Law Judge, EPA has seven federal administrative law judges who conduct administrative hearings concerning all environmental programs, including the hazardous waste program.

According to EPA enforcement officials, the administrative hearing process is very lengthy because EPA has not established mandatory time frames for conducting the hearings and obtaining decisions in them. EPA attorneys, on the other hand, told us that establishing time frames for administrative hearings would be difficult. According to one attorney, administrative law judges have considerable independence in how they carry out their functions, and many factors, such as the judges' caseload and the complexity of cases, affect the length of hearings and the timeliness of decisions. In addition, EPA's Chief Administrative Law Judge was concerned that establishing such time frames would limit judges' flexibility in scheduling work and allowing involved parties sufficient time to prepare for hearings.

The states we reviewed, however, have taken such steps to curtail delays. Georgia has established mandatory time frames for obtaining decisions in administrative hearings. Administrative law judges generally must render their decision within 30 days after the hearing is conducted. Texas has established a 60-day time frame for obtaining decisions in administrative hearings. However, a state hearing examiner informed us that this time frame is not mandatory.

While Illinois also has established a mandatory time frame for obtaining administrative decisions, an Illinois attorney told us that facilities can waive it to gather additional information or to negotiate with state agencies. She said that many facilities use this privilege to delay hearings for years. We found evidence of such delays during our review. In October 1986, an Illinois facility appealed the state agency's revisions to its closure plan. The Pollution Control Board, which is responsible for conducting administrative hearings, did not render a decision in the case until December 1990. According to an Illinois attorney, the facility had requested an open waiver of the board's decision. Thus, closure activity was delayed for over 4 years pending the hearing and a final decision from the board.

According to EPA's Enforcement Policy and Regional Operations Branch Chief, the small number of administrative law judges in comparison with the total caseload is the major factor causing delays, rather than the lack of mandatory time frames. According to EPA's Chief Administrative Law judge, as of July 1991 there were 955 administrative actions in the system, or about 135 for each of the seven judges. EPA's Enforcement Policy and Regional Operations Branch Chief said that the agency has explored the possibility of using regional RCRA resources to hire additional judges to

hear RCRA enforcement cases, but the agency is not actively pursuing this alternative because additional judges could probably not be dedicated to RCRA cases and would have to handle other environmental cases, such as those covered under the Clean Air Act and the Clean Water Act, as well.

Waste Removal Attempts Have Delayed Closure

Closure at some facilities has also been delayed because they have attempted, unsuccessfully, to remove their waste rather than close with it in place. If such attempts are successful, owners/operators are not required to obtain a post-closure permit, which requires them to maintain the facility and monitor the groundwater for 30 years following closure. However, EPA believes that groundwater contamination will prevent most facilities from successfully removing all their waste and avoiding these requirements. Even so, states may be granting extensions to facilities that attempt to remove waste, which ultimately delays when these facilities will have to comply with closure and post-closure requirements.

EPA's time frame for completing closure, once a facility has an approved closure plan, is 6 months. However, facilities that attempt to remove waste rather than close with it in place may require longer periods of time to determine if the waste can be completely removed. EPA has no realistic guidelines for (1) how long this determination should take, (2) when facilities should be provided the option to attempt waste removal, or (3) when waste removal attempts should be curtailed and closure with the waste in place required. As a result, some states have taken it on themselves to grant extensions to facilities attempting waste removal, even though these facilities may not be able to sufficiently remove the waste and will have to close with some in place. In the interim, these facilities do not have covers on their units to minimize the migration of hazardous waste to the groundwater or surface water and may not have installed adequate groundwater monitoring systems to detect any contamination.

Facilities that attempt waste removal generally must excavate all contaminants and the surrounding soil or use technologies such as bioremediation[1] to clean up the soil. According to EPA's Chief of Monitoring and Technology Section, physically removing waste might take a year or more, while bioremediation might take 2 years or more, depending on the specific facility. These time frames are significantly longer than the 6-month time frame established by EPA for completing closure.

[1]Bioremediation is a technique in which microorganisms are used to accelerate the degradation of environmental contaminants.

We found that more Texas facilities we reviewed had encountered delays in closure as a result of attempts to remove waste than had the facilities we reviewed in Georgia and Illinois. In Texas, four of the eight facilities we reviewed have attempted to remove their waste. As of June 1991, three of the four facilities had discontinued their attempts. Officials are allowing the fourth facility to continue its attempts even though groundwater is contaminated. The state agency approved the facility's closure plan in June 1988, and a sampling analysis conducted 2 months later revealed that the groundwater surrounding the facility had been contaminated with benzene, toluene, and xylene. Despite the results of this analysis, in February 1989 the Texas Water Commission granted the facility an extension to continue its efforts to remove its waste. The facility is still continuing to remove waste, even though the groundwater contamination will result in the facility's having to comply with closure and post-closure requirements. The state has allowed these lengthy delays because, according to state enforcement officials, removing any amount of waste is preferable to leaving it in the ground.

While we believe that facilities should attempt to remove waste when this is a realistic option, we do not believe that facilities with known groundwater contamination should be allowed to indefinitely delay their compliance with closure and post-closure requirements. If facilities are leaking hazardous substances into the groundwater, failing to properly cover the facilities can further the migration of contamination, thus increasing environmental and health risks.

Lack of Guidance Delays Issuance of Post-Closure Permits

Even though, in fiscal year 1991, EPA made post-closure permits a high priority and has required that regions and states establish and meet targets for issuing these permits, it has provided no guidance on when applications for these permits should be called in. While timely closing of facilities is needed to eliminate or minimize the spread of contamination at closing land disposal facilities, post-closure permits ensure that any existing contamination is cleaned up. However, because EPA has not provided guidance for calling in permit applications, there are inconsistencies among the states in doing so. While an official in one state informed us that the state requested permit applications from land disposal facilities on the date they lost interim status, an official in another state told us applications are generally requested after facilities have completed closure.

Requiring facilities to submit post-closure permit applications could force them to install groundwater monitoring systems in a more timely manner, as was the case in Georgia. An EPA Region IV enforcement official said the region required facilities to submit their post-closure permit applications early on to force the facilities to install groundwater monitoring systems. As of September 1991, 30 percent of the closing land disposal facilities in Region IV had received their post-closure permits. Nationally, only 11 percent of the 837 facilities had.

The results of Region IV's early initiative are evidenced in the progress states have made in closing and issuing post-closure permits to facilities. Georgia officials said that as of June 1991, the state had called in permit applications from all 23 of its closing facilities and had issued 16 post-closure permits. Regions V and VI officials told us that issuing operating permits was a higher priority than issuing post-closure permits. We found that few facilities in the states of Illinois and Texas have closed or been issued post-closure permits, and some have not even installed groundwater monitoring systems.

Officials in Regions V and VI told us they have instructed states to request permit applications from facilities on the basis of the environmental threat they pose—that is to say, the greater the threat posed by a facility, the earlier the permit application should be called in. Once the application is called in, regional officials said that they generally prefer to delay issuance of the post-closure permit until a facility has certified closure because they have more knowledge about the facility at that time. Following Region V's guidance, a state official said Illinois has requested post-closure permit applications from 3 of its 22 facilities, but has issued no post-closure permits. According to the Chief of the Permit Section in Texas, 15 of the state's 52 land disposal facilities have been requested to submit post-closure permit applications, but only 1 facility has been issued a permit. Region IV and Georgia state officials disagree with the instructions provided by Regions V and VI, however. These officials told us that states need not delay issuing permits because closure certification provides no additional information needed to write a permit. Furthermore, a Georgia official said that permits can be modified, if necessary, after closure is certified. Georgia hazardous waste officials said they prefer issuing permits as soon as basic information necessary to complete the permit applications is available. The officials follow this tact because permits enhance the effectiveness of enforcement actions and provide for greater environmental protection than allowing facilities to remain in interim status.

Costs of Requirements Could Affect Compliance

Complying with closure and post-closure requirements is a costly endeavor and could prevent some owners/operators with limited financial resources from being able to close facilities and obtain post-closure permits. EPA's minimum requirements for groundwater monitoring call for one upgrade well to determine the quality of groundwater before it reaches a land disposal unit, and three downgrade wells to detect any contamination entering the groundwater as it passes under or by the unit. According to a geologist in EPA Region IV, the minimum cost of installing an adequate groundwater monitoring system is about $20,000. However, the number of wells needed varies according to the geology and the hydrology of the site. He estimated that the average cost of installing a monitoring system ranges from $50,000 to $100,000. According to the Chief of EPA's Technical Assistance and Training Branch, installing an adequate groundwater monitoring system can cost as much as $3 million.

Owners/operators are financially responsible not only for installing monitoring systems, but also for providing post-closure care for a minimum of 30 years following closure. During this 30-year period, owners/operators must collect and analyze groundwater samples for contamination and provide the results of the analyses to EPA and/or the authorized states. If any leakage results in groundwater standards' being exceeded, owners/operators must then assess the nature and extent of the problem and correct any resulting environmental damage. This process—referred to as corrective action—may involve curtailing or preventing any further leakage from hazardous waste units and removing contaminants from the groundwater. The average cost of corrective action is estimated at $6.3 million.

Many owners/operators of closing land disposal units are facing financial difficulties that could prevent them from complying with these costly requirements. As of June 1991, 6 of the 97 closing land disposal facilities in the three states had been abandoned or had declared bankruptcy, and state officials have concerns over the financial status of 13 other facilities. While a Georgia official said that only 1 of the state's 23 closing land disposal facilities has declared bankruptcy, an Illinois official told us that 2 of the state's 22 closing facilities have declared bankruptcy, and he anticipates that 3 additional facilities may join them. In Texas, according to an Assistant Attorney General, 3 of the state's 52 closing facilities have declared bankruptcy. Another 10 facilities have no remaining assets but have not filed for bankruptcy. None of these facilities has been able to close and be issued a post-closure permit. EPA regional and state officials told us that many owners/operators will be financially unable to install

groundwater monitoring systems, properly close, or care for the units for 30 years.

Few Incentives to Comply With Closing Requirements

Some owners/operators that may have the financial resources to comply with EPA's closure and post-closure requirements are investing their resources in contesting formal enforcement orders, rather than in complying with EPA's and the states' regulations. EPA identified this issue in a 1990 study, and we also found this situation to be occurring in Illinois. Because closing facilities have lost interim status and can no longer accept hazardous waste, they are not producing revenue. Thus, owners/operators of closing facilities have fewer incentives to spend funds to install costly groundwater monitoring systems, properly cover disposal units, or maintain financial assurances to care for sites. In contrast, owners/operators of operating hazardous waste facilities have more incentives to comply with operating requirements, including the requirements to install groundwater monitoring systems and provide financial assurance for long-term post-closure care, because these owners/operators must obtain a permit to continue operating.

EPA can increase incentives by seeking to impose personal liability on individual facility owners/operators for the costs associated with closure and post-closure care. According to EPA, it is the agency's enforcement policy to seek to hold corporate officers personally liable as operators under RCRA when those individuals personally participated in the activities that EPA determines were in violation of RCRA. EPA detailed its policy on this matter in December 1990, when it petitioned an administrative law judge to reconsider his decision that an officer of a Georgia facility was not personally liable for violations of RCRA. In its petition, EPA stated that it decides whether or not to name corporate officers as operators on the basis of their involvement or decision-making in the day-to-day operations of hazardous waste facilities.

Imposing personal liability can provide a meaningful remedy in cases in which corporations file for bankruptcy or have insufficient assets to carry out closure and post-closure requirements. However, this option is only effective in facilitating closure if the owners/operators who are held liable are financially capable of compliance.

Limited Options for Closing Land Disposal Facilities When Enforcement Fails

EPA and the states have few options available to close land disposal facilities and issue them post-closure permits when enforcement efforts do not return facilities to compliance. While EPA and the states can increase enforcement efforts, these efforts will not always result in compliance and could, eventually, result in either bankruptcy or expensive, time-consuming hearings. Ultimately, some facilities may have to be cleaned up at the public's expense. However, information on which facilities should be cleaned up because of the environmental risk they pose and on the most cost-effective approach for doing so is currently not available. As discussed in chapter 2, EPA has made no comprehensive assessment of the status of groundwater monitoring at closing facilities because the agency believes that its ranking of land disposal facilities provides sufficient information. However, without a monitoring system to provide a thorough understanding of the nature and extent of contamination, the risks a facility poses may not fully be known. EPA also has not assessed facilities' financial statuses or the likelihood that facilities will comply with closure and post-closure requirements. EPA raised these issues in its 1990 study. However, the agency has not yet developed a plan to study these issues or taken the minimum steps necessary to prevent any further contamination or those steps necessary for long-term care.

EPA's 1990 study of compliance recommended that closing facilities be assessed to determine which are most likely to respond to increased enforcement efforts, ranked according to their environmental significance, and addressed accordingly. The study recognized, however, that certain problems, such as insufficient funds, may prevent many facilities from returning to compliance in the near future even though EPA could expend additional resources in taking enforcement actions against them. In these instances, the study recommended that EPA consider other options, such as referring cases to the national Superfund or the civil court system. The study did not, however, recommend when EPA should decide that facilities cannot be closed under its enforcement program. It also did not examine who should install (1) groundwater monitoring systems to provide basic information on the nature and extent of any groundwater contamination and (2) final covers to minimize the spread of any contamination to groundwater or surface water, nor did the study examine when these items should be installed. The study also did not address conditions under which facilities would be referred to the national Superfund, an analogous state program, the civil court system, or any other program for cleanup and care. Furthermore, EPA's study did not examine which option would provide the quickest results or how much the options would cost. In October 1991, EPA issued to its regions a memo about the study's results,

asking that regional representatives be designated to help devise a national strategy to address land disposal facilities that have not complied with RCRA's requirements. However, according to EPA's Policy and Regional Operations Branch Chief, as of January 1992, the regional representatives had not yet met to discuss the situation.

If EPA determines that these facilities should be referred to the national Superfund or analogous state programs, rather than addressed under the RCRA program, additional delays could occur and costs could therefore escalate. On average, it has taken over 10 years to clean up contamination at a facility once it has been referred to the Superfund program, with costs averaging about $25 million per site. If facilities do not qualify for cleanup under the national program, additional delays in closing them and cleaning up contamination could occur as a result of limited state funding.

Conclusions

Certifying closure and issuing post-closure permits are delayed by various factors not addressed by EPA's enforcement policy. Once enforcement action is initiated, negotiations and appeals can be very lengthy. Establishing time frames for conducting negotiations and for holding administrative hearings and obtaining decisions could be helpful in expediting the process. In addition, the lack of guidance concerning which facilities should be allowed to remove waste rather than contain it has resulted in delays in closure. While we endorse policies that encourage waste removal, we believe that closure plans adopting this alternative need to be closely evaluated to determine their feasibility and the reasonableness of time frames. Additional delays occur in issuing post-closure permits because EPA has not provided guidance on when post-closure permit applications should be requested and processed. Earlier submissions of such applications could force facilities to install groundwater monitoring systems in a more timely manner.

While EPA can implement various changes to ensure greater compliance with closure and post-closure requirements, the agency acknowledges that some closing land disposal facilities, either because of financial distress or the lack of incentives, will not comply with RCRA's requirements. EPA's enforcement efforts will likely be unsuccessful at these facilities, and until adequate groundwater monitoring systems are installed to provide critical information on the actual or potential threat these facilities represent, no one is in a position to determine how great a threat these facilities pose. In addition, until the waste at these facilities is properly contained, there is nothing to prevent migration to groundwater and surface water. EPA needs

to consider alternatives to its current efforts to close these facilities. This consideration would include determining whether it would be appropriate for EPA or the states to take unilateral actions to complete closure and post-closure activities, such as installing adequate groundwater monitoring systems, and determining the most efficient and cost-effective means of accomplishing them.

Recommendations

GAO recommends that the EPA Administrator

- establish time frames for settling disagreements with owners/operators after enforcement orders are issued, and when such disagreements cannot be resolved and orders are appealed, evaluate the feasibility of establishing time frames for administrative hearings and for obtaining decisions in those hearings;
- develop guidance regarding (1) when facilities should be allowed to attempt waste removal and how long these attempts should continue before facilities are instructed to revise their closure plans to close with waste in place and (2) when regions and states should request post-closure permit applications; and
- develop and implement a plan that (1) identifies those closing land disposal facilities not making reasonable progress toward properly closing and unlikely to comply with RCRA's requirements, (2) determines who will install necessary groundwater monitoring systems and when they will be installed to provide basic information on the nature and extent of groundwater contamination, (3) determines the best options for controlling and/or cleaning up—in a reasonable time—those facilities that pose the greatest threat.

Major Contributors to This Report

Resources, Community, and Economic Development Division, Washington, D.C.

Peter F. Guerrero, Associate Director
Gerald E. Killian, Assistant Director
Ned L. Smith, Assignment Manager
Thaddeus J. Gapinski, Senior Evaluator

Dallas Regional Office

Marcia B. McWreath, Regional Assignment Manager
Deborah S. Ortega, Evaluator-in-Charge
Sandra H. Vice, Site Senior
M. Leigh McCaskill, Staff Evaluator

Ordering Information

The first copy of each GAO report is free. Additional copies are $2 each. Orders should be sent to the following address, accompanied by a check or money order made out to the Superintendent of Documents, when necessary. Orders for 100 or more copies to be mailed to a single address are discounted 25 percent.

U.S. General Accounting Office
P.O. Box 6015
Gaithersburg, MD 20877

Orders may also be placed by calling (202) 275-6241.

United States
General Accounting Office
Washington, D.C. 20548

Official Business
Penalty for Private Use $300

First-Class Mail
Postage & Fees Paid
GAO
Permit No. G100