

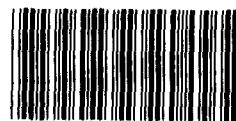
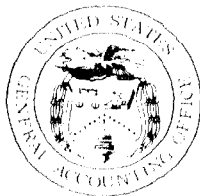
GAO

Report to the Chairman, Subcommittee
on Oversight and Investigations,
Committee on Energy and Commerce,
House of Representatives

April 1990

HAZARDOUS WASTE

Status and Resources of EPA's Corrective Action Program



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Resources, Community, and
Economic Development Division

B-239014

April 19, 1990

The Honorable John D. Dingell
Chairman, Subcommittee on Oversight
and Investigations
Committee on Energy and Commerce
House of Representatives

Dear Mr. Chairman:

In response to your July 31, 1989, request and subsequent discussions with your office, we studied the Environmental Protection Agency's (EPA's) corrective action program that resulted from the 1984 Resource Conservation and Recovery Act (RCRA) amendments. This program is designed to clean up hazardous waste that could be contaminating the land and air and seeping into the nation's ground and surface waters from facilities that treat, store, incinerate, or dispose of this waste. Specifically, this report addresses (1) the status of the corrective action program at hazardous waste facilities, including those facilities owned by the federal government, and (2) the level of staff resources that EPA's 10 regional offices are committing to the corrective action program.

EPA's corrective action program involves four stages: (1) EPA assesses the RCRA facilities to determine if any have the potential to leak or are leaking hazardous waste, (2) facility owner/operators investigate facilities to confirm the presence of leaks and determine their rate and extent, (3) facility owner/operators study corrective measures to develop cleanup options from which EPA selects cleanup remedies, and (4) facility owner/operators implement the selected corrective measures and complete cleanups.

Results in Brief

Of the 4,615 facilities in the RCRA hazardous waste universe, most have not yet been assessed to determine if a leak or potential leak exists. Of the 1,711 facilities that have been assessed, cleanup remedies are being studied, proposed, selected, or implemented for 95. The status of corrective action at federally-owned hazardous waste facilities (338 of the 4,615) resembles that of the overall universe of hazardous waste facilities. The level of staff resources that EPA's 10 regional offices estimated they committed to the overall corrective action program in fiscal year 1989 was 216 staff years. Of the estimated 216 staff years, which were almost twice what EPA headquarters budgeted, 118 were estimated to be used for critical oversight of cleanup activities underway. According to

EPA estimates, the 10 regional offices would have needed over 300 staff years for oversight, or more than two and one-half times that estimated to be used. EPA is budgeting more staff resources to corrective action in fiscal years 1990-91. However, if EPA intends to meet the 1984 RCRA amendments mandating various permitting deadlines by November 1992, almost all of the corrective action staff resources will have to be devoted to performing assessments and issuing corrective action permits. This will leave very little regional staff resources available for the vital oversight function.

Status of Corrective Action at Facilities

As of January 1990, 4,615 facilities, including those owned by the federal government, were in the RCRA hazardous waste universe. Facility assessments have been completed at 1,711, or 37 percent, of the facilities and 1,422 show evidence of a hazardous waste release or potential release requiring further investigation. The remaining 2,904 facilities have not yet been assessed. At 81 of the facilities requiring further investigation, investigations have been completed and facility owner/operators have begun to study and propose cleanup remedies, while at 11 others cleanup remedies have begun to be implemented and at 3 others cleanups have been completed. (See app. II.)

The status of corrective action at federally-owned hazardous waste facilities (338 of the 4,615) resembles that of the overall universe of hazardous waste facilities. Of the 146, or 43 percent, of the federal facilities for which assessments have been completed, 137 show evidence of a leak or potential leak requiring further investigation. The remaining 192 facilities have not yet been assessed. The federal government has completed investigations at five of the federal facilities requiring further investigations and has begun to study and propose cleanup remedies. No federal facilities have begun to implement cleanup remedies. (See app. III.)

Regional Office Staff Resources Devoted to Corrective Action

In fiscal year 1989, EPA's 10 regional offices reported using 216 staff years for all of its corrective action activities. This level of staffing was almost twice the 117 staff years EPA had budgeted for corrective action activities that fiscal year. Even though regions devoted increased resources to corrective action, the regional offices could not fully oversee corrective action at facilities undergoing further investigation and cleanup. Oversight is a critical component of EPA's corrective action program because it includes reviews of facility owner/operator workplans,

studies, and reports as well as site inspections during each of the stages to ensure that corrective actions are completed as planned.

Of the 216 staff years used by the 10 regional offices in fiscal year 1989, we estimated that about 98 staff years were used to complete assessments and/or issue permits or orders and about 118 staff years were used to maintain corrective action oversight at facilities that were investigating, studying, or implementing cleanup. According to EPA headquarters estimates, the 10 regional offices would have needed over 300 staff years in fiscal year 1989, or more than two and one-half times what the region estimated using to fully maintain oversight at assessed facilities that were investigating, studying, or implementing cleanup.

The shortfall of regional resources needed to maintain corrective action oversight responsibility in future years will worsen even though EPA is increasing the staff years allocated for overall corrective action. If EPA intends to meet the 1992 permitting mandate, almost all of the EPA regional office staff years will have to be used for completing over 1,000 additional assessments and issuing corrective action permits. In fiscal year 1990, EPA budgeted 144 regional office staff years for corrective action activities and is proposing 186 regional office staff years for fiscal year 1991. These increases are still below the 216 staff years the regions estimated they used in fiscal year 1989, which were insufficient to maintain corrective action oversight. Even at fiscal year 1989 staffing levels, we estimate EPA's regions would have, on average, 6 staff days per facility, per year, over the next 2-1/2 years for critical oversight of facility owner/operator activities. However, EPA headquarters says, on average, 160 staff days per year are needed.

We recognize that the states commit staff resources to corrective action and that this allocation reduces the staff resource burden on EPA. While we attempted to obtain information on the amount of state staff resources used for corrective action, data were not available. As a result, our analyses do not include state staff resources. (See app. IV.)


We studied the status of the corrective action program, including federal facilities, by using data tapes from two information management systems maintained by EPA—the Hazardous Waste Data Management System and the Corrective Action Reporting System. The tapes contained data as of January 1990. Although we did not validate the data in these systems, we did follow up with regional office officials on certain data that were incomplete.

To obtain information on regional resources used to implement corrective action, we sent a questionnaire to each of EPA's 10 regional offices. We asked regional officials to provide us information on the staff resources used for various corrective action activities and regional office corrective action accomplishments during fiscal year 1989. The questionnaire results are included in appendix V.

We conducted our review between September 1989 and March 1990 in accordance with generally accepted government auditing standards, except that we did not verify EPA's data bases or internal controls. We discussed the results of our review with EPA officials, who generally agreed with the data presented. Their comments are incorporated, where appropriate. As requested, we did not obtain official comments on this report. Details of our objectives, scope, and methodology are contained in appendix I.

As agreed with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 15 days from the date of this letter. At that time we will send copies to appropriate congressional committees; the Administrator, EPA; the Director, Office of Management and Budget; and other interested parties. Copies will be made available to others upon request. If we can be of further assistance, please contact me at (202) 275-6111. Major contributors to this report are listed in appendix VI.

Sincerely yours,



Richard L. Hembra
Director, Environmental Protection
Issues

Contents

Letter		1
<hr/>		
Appendix I		10
Introduction	Facility Operations Requiring Corrective Action	10
	RCRA Corrective Action Process	12
	Federal/State Partnership	14
	Objectives, Scope, and Methodology	14
<hr/>		
Appendix II		17
EPA's Progress in Assessing Facilities	Universe of Hazardous Waste Facilities	17
	EPA's Progress in Assessing Facilities	18
	Status of Facilities Assessed	19
	Progress in Cleaning Up Facilities	19
	Operating and Closing Facilities	21
<hr/>		
Appendix III		24
Status of Corrective Action at Federal Facilities	Universe of Federal Hazardous Waste Facilities	24
	Progress in Assessing Federal Facilities	25
	Progress in Cleaning Up Federal Facilities	25
<hr/>		
Appendix IV		27
Staff Resources to Oversee Corrective Action Are Limited	Resources Used to Oversee Corrective Action Are Below EPA's Recommended Levels	28
	Staff Resources to Oversee Corrective Action Affected by Statutory Deadlines	30
	Staff Years Budgeted for Fiscal Year 1990 and Proposed for 1991 Are Not Sufficient for Corrective Action Oversight	32
<hr/>		
Appendix V		33
Regional Office Staff Day and Staff Year Estimates Used for RCRA and Corrective Action		

Appendix VI Major Contributors to This Report	39
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Tables		
Table II.1: EPA's Use of Permits and Enforcement Orders to Initiate RFIs by Facility Type		23
Table III.1: Ownership and Type of Federal Hazardous Waste Facilities		24
Table IV.1: RFAs and Corrective Action Permits Needed at Operating Facilities to Meet the Permitting Deadlines		30
Table V.1: Number of Staff Years Used for RCRA and Corrective Action Program Activities		34
Table V.2: Number of Regional Staff Days to Complete an RFA or Review a Contractor or State Drafted RFA		35
Table V.3: Estimated Number of Staff Days to Complete the Corrective Action Portion of a Part B Permit		36
Table V.4: Estimated Number of Staff Days to Issue a Corrective Action Order		36
Table V.5: Estimated Number of Staff Days Spent, Per Year, by EPA Staff in Oversight of Corrective Action, Per Facility		37
Table V.6: Number of RFAs Completed and Permits and Orders Issued During Fiscal Year 1989		38

Figures		
Figure I.1: RCRA Corrective Action Process		13
Figure II.1: Number, Percent and Types of RCRA Facilities Requiring Assessment for Corrective Action		17
Figure II.2: RFAs Completed by Type of Facility		18
Figure II.3: Facilities Requiring Corrective Action Based Upon RFA Results		19
Figure II.4: Progress in Cleaning Up Facilities		20
Figure II.5: Status of Facilities, by Type, Requiring RFIs		21
Figure II.6: Operating and Closing Facilities		22
Figure III.1: Federal Facilities Requiring Corrective Action Based Upon RFA Results		25
Figure III.2: Progress in Cleaning Up Federal Facilities		26

Abbreviations

EPA	Environmental Protection Agency
CMI	Corrective Measures Implementation
CMS	Corrective Measures Study
FTE	Full Time Equivalent
GAO	General Accounting Office
RCRA	Resource, Conservation, and Recovery Act
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation

Introduction

Thousands of hazardous waste facilities across the country, including those owned by the federal government, handle toxic chemicals that could be seeping into the nation's groundwater and surface waters and contaminating the land and the air. This situation is the result of years of the inadequate management practices of many facilities that treat, store, incinerate, or dispose of materials that contain hazardous chemical waste.¹ The magnitude of the environmental threat posed by leaking hazardous waste facilities was initially recognized by the Congress when it enacted the Resource Conservation and Recovery Act of 1976 (RCRA). This act gave EPA the authority to manage hazardous waste from its generation to disposal. During the late 1970s and early 1980s, however, the Congress became concerned over numerous incidents of contamination at hazardous waste facilities. As part of the 1984 RCRA amendments, the Congress mandated that EPA require corrective action and clean up all leaking hazardous waste facilities as part of EPA's overall responsibilities.

Over 5 years have passed since the 1984 amendments were enacted. Concerned about EPA's progress in requiring corrective action at leaking hazardous waste facilities, the Chairman of the Subcommittee on Oversight and Investigations, House Committee on Energy and Commerce, asked us to determine the status of the corrective action program at hazardous waste facilities and EPA's regional resources devoted to this program.

Facility Operations Requiring Corrective Action

RCRA requires any person or company owning or operating a treatment, storage, incinerator, or disposal facility to obtain a permit. To control facilities until EPA could issue operating permits, facilities were allowed to continue operating under "interim status" until final permits were issued or denied. Facilities with interim status must comply with interim status regulations, which include general operating and design requirements. After receiving a permit, facilities must comply with EPA's final permit regulations, which include facility-specific technical standards.

The operations of hazardous waste facilities are often very complex. Since various methods are used to treat, store, incinerate and dispose of many different types of hazardous wastes, a hazardous waste facility includes many solid waste management units, including landfills, surface impoundments, waste piles, incinerators, and container storage

¹Hazardous Waste: New Approach Needed to Manage the Resource Conservation and Recovery Act (GAO/RCED-88-115, July 19, 1988).

areas. Prior to the 1984 amendments, only certain solid waste management units at land disposal facilities were subject to corrective action. These included land disposal units such as landfills, surface impoundments, waste piles, and land treatment units in operation as of January 1983. EPA refers to these land disposal units as "regulated" units. Solid waste management units at incinerators and treatment and storage facilities were not subject to corrective action, nor were land disposal units at land disposal facilities that stopped receiving waste as of January 1983. These units are referred to as "nonregulated" units. Because many hazardous waste facilities, including those owned by the federal government, have been operating for many years, it is not uncommon for facilities to have a number of solid waste management units, both regulated and nonregulated.

The 1984 RCRA amendments mandate that EPA require all facilities to determine whether any of their regulated and nonregulated units are leaking and, if so, to require the facility owner/operator to carry out corrective action. As a result, the 1984 amendments expanded the focus of the RCRA corrective action program from detecting and monitoring releases (leaks) as they occurred at active regulated units to cleaning up problems resulting from both regulated and nonregulated units within a RCRA facility. Because of this expanded focus, the number of solid waste management units at a hazardous waste facility, as well as the number of hazardous waste facilities subject to corrective action, increased dramatically. For example, EPA estimated that the average number of units per facility subject to corrective action increased 16-fold as a result of the 1984 RCRA amendments, and because incinerators and treatment and storage facilities were also required to clean up their nonregulated units, the total number of units for all hazardous waste facilities subject to corrective action increased 27-fold.

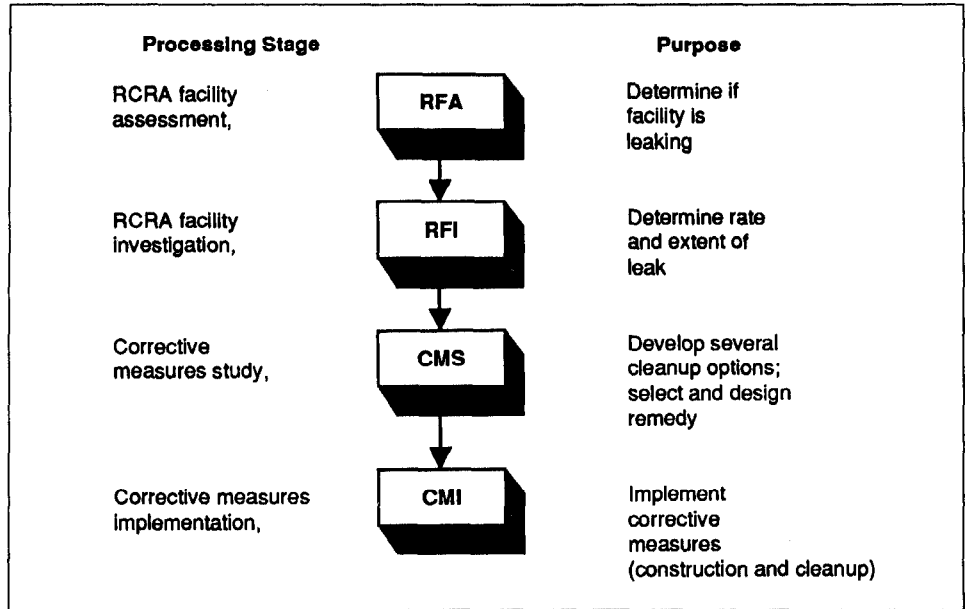
The 1984 amendments established deadlines for final permit determinations, in addition to requiring corrective action at all permitted facilities. The statutory deadlines require that land disposal facilities be issued or denied final permits by November 1988, that incinerators be issued or denied permits by November 1989, and that treatment and storage facilities be issued or denied permits by November 1992. To meet these deadlines, EPA has provided guidance to the regions to issue permits to operating facilities by the above statutory dates. According to EPA, closing facilities are to be assessed and/or issued permits as time and regional staff resources allow. In instances where EPA has not been able to meet the statutory deadlines, EPA has allowed the facilities to continue operating until final permits are issued or denied.

Because many owner/operators are unable to meet regulatory requirements as specified by the 1984 amendments, a large number of facilities have decided to close their solid waste management units and not seek permits to operate. Regardless of whether a facility plans to discontinue operating or to seek a permit to continue operating, it will be required by EPA to carry out corrective action at any leaking solid waste management unit. For facilities seeking permits, EPA requires corrective action as a prerequisite to obtaining a permit. EPA uses enforcement orders to require corrective action at facilities that are not due to receive permits in the immediate future or at facilities not requiring permits to close, such as treatment and storage facilities.

RCRA Corrective Action Process

The intent of the RCRA corrective action program is to require facilities to clean up their leaking solid waste management units. EPA is responsible for approving the various stages in the cleanup process and monitoring cleanup activities. Although the identification of leaking facilities and the determination of corrective action for these facilities follow a logical process, EPA can require facility owner/operators to take appropriate interim measures in the event of an immediate threat to human health or the environment. As illustrated in Figure I.1, the process generally includes four stages—the RCRA facility assessment (RFA), the RCRA facility investigation (RFI), the corrective measures study (CMS), and the corrective measures implementation (CMI).

Figure I.1: RCRA Corrective Action Process



Note: Interim measures can occur at any point in the corrective action process.

EPA performs the RFA to identify actual and potential releases from all solid waste management units. The RFA includes, among other things, a file review, a site inspection, and often sampling. This assessment determines whether sufficient evidence of a release exists to require the facility owner/operator to undertake more detailed investigations.

An RFI is the next stage in the corrective action process. If EPA determines that sufficient evidence of a release of hazardous waste or hazardous chemicals does exist at a facility, EPA will require a facility owner/operator to conduct an RFI to characterize the nature, extent, and rate of releases to the air, soil, or water. While the facility owner/operator is responsible for conducting the RFI, EPA is responsible for overseeing the work through reviews of workplans, reports, and site inspections.

Once the RFI stage is completed, EPA evaluates the results and determines whether corrective measures are needed. If so, the facility owner/operator is required to complete a CMS. The CMS proposes various cleanup remedies. EPA is responsible for overseeing the work performed during the CMS and ultimately selects the remedy that best addresses corrective action at the facility.

The facility owner/operator implements the selected remedy during the CMI. During this stage, EPA requires the facility owner/operator to design, construct, operate, maintain, and monitor the corrective measures. Again, EPA is responsible for overseeing the work conducted by the owner/operator to ensure that work is completed as planned.

Federal/State Partnership

At the federal level, EPA administers the corrective action program through its 10 regional offices. Like many other environmental laws, RCRA provides for states to assume the responsibility of implementing and enforcing the RCRA corrective action program and requires EPA to oversee the states' programs. The states are encouraged to implement the program because each state is more familiar with regulating its own community and, therefore, is in a better position to more effectively administer the program and respond to local needs than the federal government. To receive authorization from EPA, a state program's regulations must be at least equivalent to the federal program and provide for adequate enforcement. However, authorized states may impose more stringent regulations than the federal government.

Because the 1984 RCRA amendments greatly expanded the requirements under the corrective action program, states must receive another authorization to implement and enforce these expanded requirements. As of January 1990, 43 states, the District of Columbia, and Guam have been authorized to administer the corrective action requirements in effect prior to 1984. These states administer corrective action at the regulated units of land disposal facilities. Only four states—Colorado, Georgia, Minnesota, and Utah—have been authorized to administer the expanded 1984 corrective action requirements. EPA's regional offices are responsible for completing RFAs, imposing RFIs through either permits or orders, and overseeing corrective action at facilities with nonregulated units in the remaining states and territories that have yet to be authorized for corrective action.

Objectives, Scope, and Methodology

On the basis of a July 31, 1989, letter from the Chairman of the Subcommittee on Oversight and Investigations, House Committee on Energy and Commerce, and subsequent discussions with the Chairman's office, we agreed to provide data on the following:

- the status of the corrective action program at hazardous waste facilities, including those facilities owned by the federal government and

- the level of staff resources EPA's regional offices are committing to the corrective action program.

To accomplish the first objective, we obtained data on the universe of RCRA hazardous waste facilities subject to corrective action and the status of corrective action at those facilities. We obtained the data from two information management systems maintained by EPA—the Hazardous Waste Data Management System and the Corrective Action Reporting System. The Hazardous Waste Data Management System contains data on facility type, federal ownership, operating status, and the date facilities received permits. The facility data we obtained from this system include only those facilities listed in EPA's multi-year strategy as those facilities subject to EPA's permitting requirements. The Corrective Action Reporting System includes data on whether a facility has had an RFA and, if so, the necessity for the facility to conduct an RFI. This system also shows what stage of the corrective action process (RFI, CMS, CMI) each facility is currently in. Both systems' data tapes included data as of January 1990.² Although we did not validate either of the two EPA information management systems, we did follow up with regional office officials on certain data that were incomplete. We also combined the data from the two information management systems to verify permitting data and to obtain more complete information on the universe of RCRA facilities subject to corrective action. EPA agreed that this approach was the best available to obtain data on the status of corrective action at hazardous waste facilities.

To accomplish the second objective, we obtained information on regional staff resources committed to implement corrective action by sending a questionnaire to each of EPA's 10 regional offices. We asked the regional officials to provide estimates of the number of staff years used for corrective action activities during fiscal year 1989 and the number of staff years used for other RCRA program activities. We also asked for information on the amount of corrective action work that staff conducted during fiscal year 1989, including the number of RFAs completed, the number of permits or orders issued for corrective action, and the estimates of regional staff days corrective action activities required. The questionnaire results are included in appendix V. We used the information

²The number of facilities in the RCRA universe is continually expanding. Facilities that discontinued their hazardous waste operations to avoid permitting requirements are still potentially subject to corrective action. This condition will increase the number of facilities that could eventually be subject to corrective action. In addition, new hazardous waste regulations will bring additional facilities into the universe of hazardous waste facilities and the corrective action program although the estimated number of facilities is uncertain.

obtained to estimate the amount of corrective action work that regional staff could perform, given regional staffing levels. Because regional office staff spend time on a number of different RCRA programs and do not account for the time spent on each program, the resource data provided are based on regional staff's best estimates.

We also met with regional RCRA corrective action permitting and enforcement officials in EPA Regions 4 (Atlanta, GA), 5 (Chicago, IL), and 6 (Dallas, TX) to discuss the status of the corrective action program in those regions and the adequacy of regional resources to carry out corrective action. We discussed the adequacy of regional resources with additional regions receiving our questionnaire, including EPA Region 3 (Philadelphia, PA), Region 7 (Kansas City, KS), and Region 2 (New York, NY).

In addition, we met with officials at EPA headquarters to obtain information on corrective action program staff years since fiscal year 1989 and detailed information on EPA's fiscal year 1990 and proposed 1991 budget for RCRA and corrective action. These officials include the Chief, Superfund/RCRA Branch, Budget Division, Office of the Comptroller; the Acting Director, Permits and State Programs Division, Office of Solid Waste and Emergency Response; and the Section Chief, Analytical Operations Support Section, Office of Waste Programs Enforcement, Office of Solid Waste and Emergency Response.

We conducted our review between September 1989 and March 1990 in accordance with generally accepted government auditing standards, except that we did not verify EPA's data bases or internal controls. We discussed the results of our review with EPA officials who generally agreed with the data presented. Their comments were incorporated, where appropriate. As requested, however, we did not obtain official comments on this report.

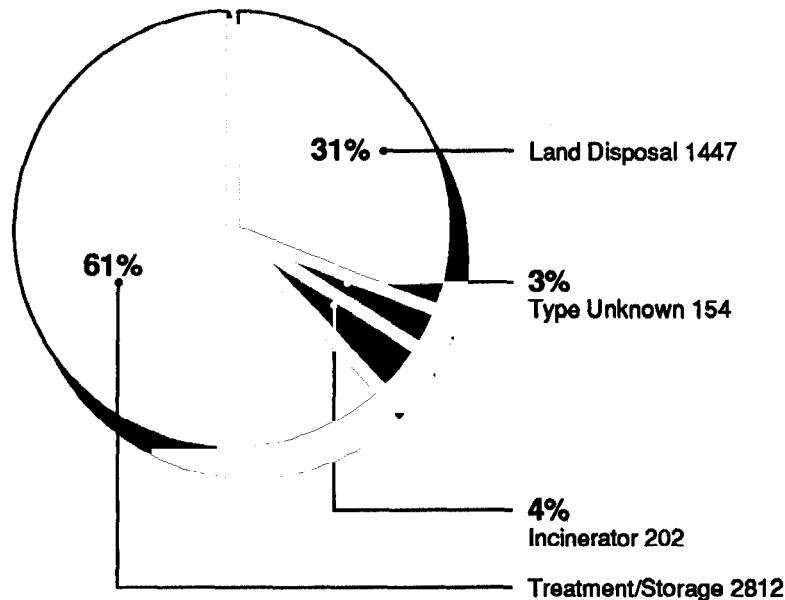
EPA's Progress in Assessing Facilities

EPA data, as of January 1990, shows that 4,615 facilities are in the RCRA hazardous waste universe and that 1,711, or about 37 percent, of these facilities have had an RFA completed. RFAs have not yet been initiated or completed for the remaining 2,904 facilities. Of the 1,711 facilities with completed RFAs, EPA has determined that 1,422, or 83 percent of the facilities, show sufficient evidence of a release or potential release of hazardous waste to warrant an RFI to confirm the release and/or characterize the hazardous release. RFIs have been initiated at 564 of these 1,422 facilities. Of the 564 facilities, 95 are at the stages where cleanup remedies have been proposed, selected, or implemented.

Universe of Hazardous Waste Facilities

As shown in Figure II.1, the largest portion of the 4,615 RCRA hazardous waste facilities are treatment and storage facilities, followed by land disposal facilities and incinerators. According to EPA's data bases, 154 of the 4,615 facilities could not be identified and classified into one of the three types of hazardous waste facilities.

Figure II.1: Number, Percent and Types of RCRA Facilities Requiring Assessment for Corrective Action

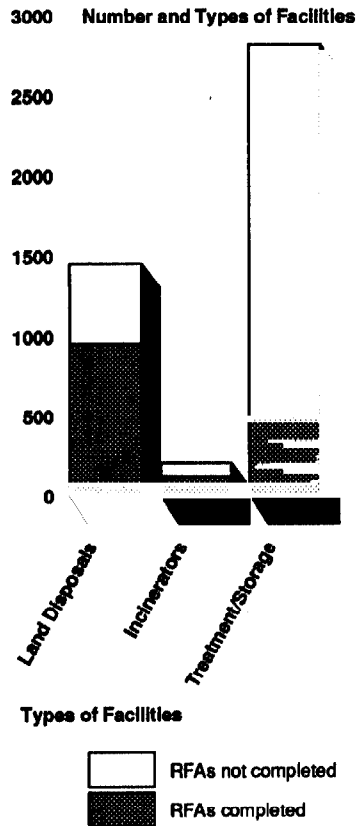


Note: Percent does not equal 100 due to rounding.

EPA's Progress in Assessing Facilities

As of January 1990, RFAs had been completed at 1,711 (37 percent) of the 4,615 hazardous waste facilities. Of the 1,711 RFAs completed, we were able to identify the types of facilities where 1,557 had been completed. However, we could not identify the types of facilities where 154 of the 1,711 RFAs were completed because EPA's data bases did not indicate if they have been completed at land disposal, incinerator, or treatment and storage facilities. For the 1,557 RFAs that we could classify by type of facility, 951 were conducted at land disposal facilities, 116 at incinerators, and 490 at treatment and storage facilities. Figure II.2 shows the number of land disposal, incinerator, and treatment and storage facilities with completed RFAs. Approximately 66 percent of the 1,447 land disposal, 57 percent of the 202 incinerators, and 17 percent of the 2,812 treatment and storage facilities have had RFAs completed.

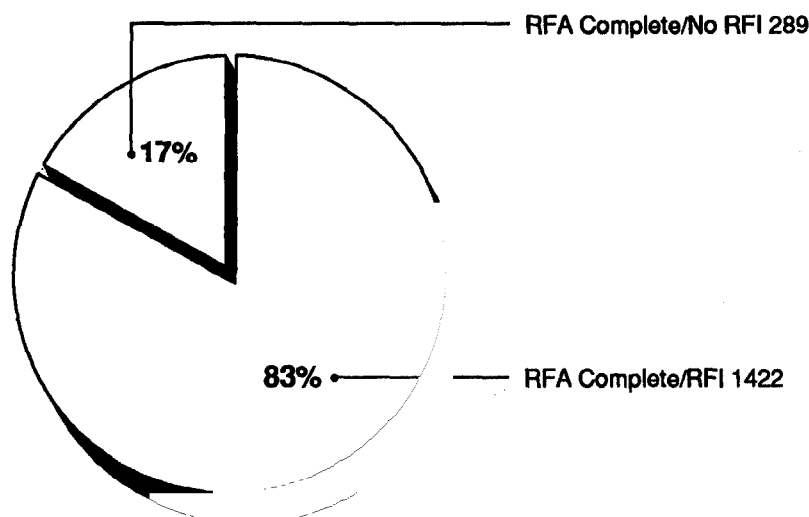
Figure II.2: RFAs Completed by Type of Facility



Status of Facilities Assessed

Of the 1,711 RFAs completed at hazardous waste facilities, EPA has determined that 1,422, or 83 percent, of the facilities have solid waste management units that are or may be causing a hazardous waste release and that the facilities require further investigation. As shown in figure II.3, EPA has determined that 289 of the 1,711 facilities have no RFIs required. RFIs were not required because the facilities have little or no likelihood of a release at any of their units and these facilities will not require further investigation at this time.

Figure II.3: Facilities Requiring Corrective Action Based Upon RFA Results

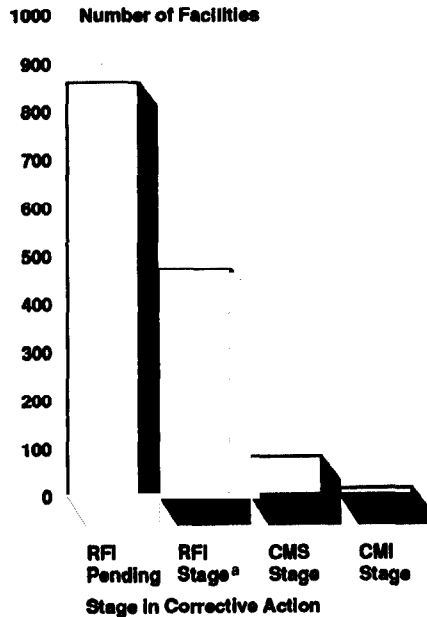


Progress in Cleaning Up Facilities

As previously discussed, 1,422 facilities that have had RFAs have solid waste management units that either are leaking or have the potential to leak and require further investigation through an RFI. Of these 1,422 facilities, 564, or 40 percent, have had RFIs imposed and 95 of these have progressed beyond the RFI stage. The remaining 858 facilities have not yet been required to investigate their solid waste management units because they have not been issued either a permit or an enforcement order to do so. For the 564 facilities that have had RFIs imposed, 469 are in the RFI stage. Of the 95 facilities that have progressed beyond the RFI stage, 81 are in the CMS stage and are studying proposed cleanup alternatives, while 14 facilities have progressed beyond the CMS stage. Of these 14, 11 facilities are in the CMI stage and 3 have completed cleanups. Figure II.4 shows the progress made by facilities that have been

determined to have solid waste management units that are or may be causing releases.

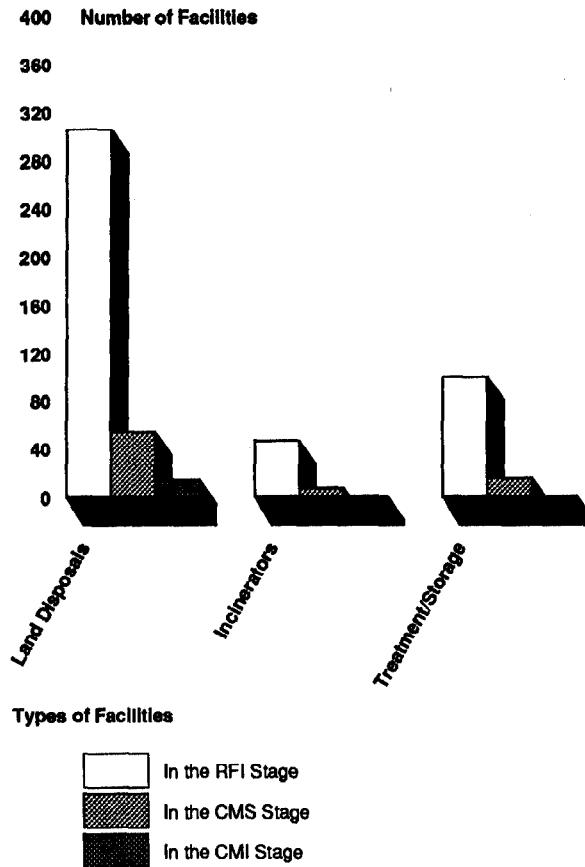
Figure II.4: Progress in Cleaning Up Facilities



^aOf the 469 facilities in the RFI stage, 20 had corrective action terminated. EPA's data bases do not indicate whether the RFI showed no evidence of a release or if corrective action was terminated because releases were cleaned up, according to EPA headquarters officials.

Of the 951 land disposal facilities that have completed RFAs, 856, or 90 percent, are or may be causing a release and require an RFI. Of these 856 facilities, 483 are still pending an RFI and 373 are in the RFI, CMS, or CMI stage. Based on the 116 RFAs completed at incinerators, 96 facilities, or 83 percent, require an RFI. Of these, 43 are pending an RFI and 53 are in the RFI, CMS, or CMI stage. Based on the 490 RFAs completed at treatment and storage facilities, 372 facilities, or 76 percent, require an RFI. Of these, 257 are pending an RFI and 115 are in the RFI, CMS, or CMI stage. Figure II.5 shows the status of facilities at which an RFI has been imposed. Most facilities are still in the RFI stage, while some have begun the CMS or CMI stage.

Figure II.5: Status of Facilities, by Type, Requiring RFIs



Operating and Closing Facilities

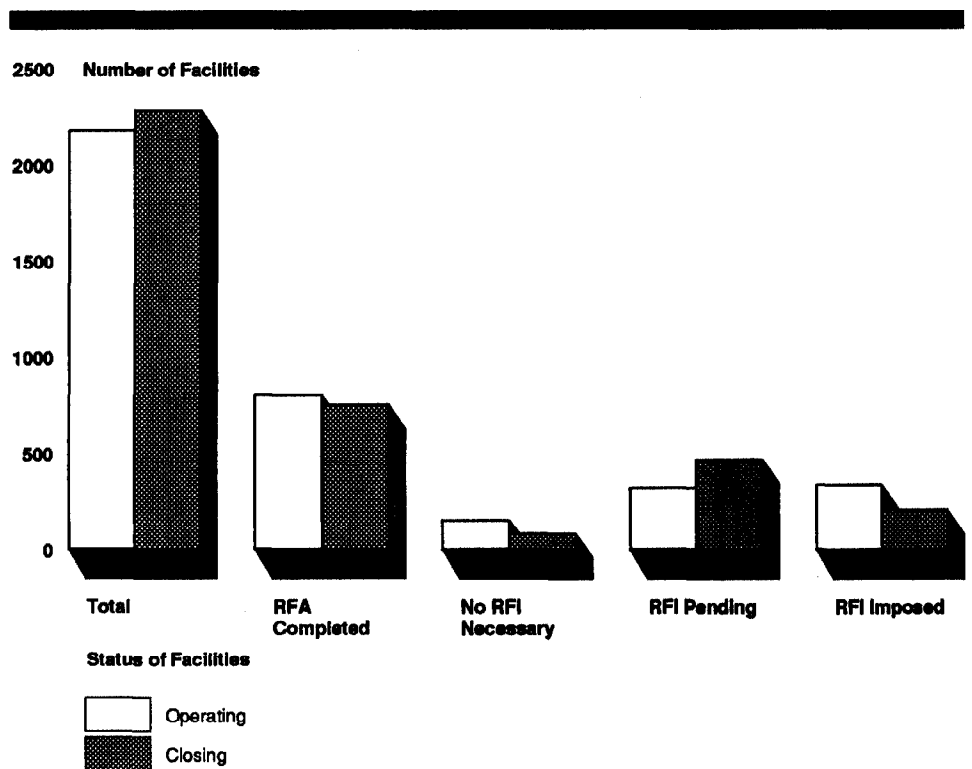
Of the 4,615 facilities in EPA's data bases, about half, or 2,179, are planning to continue operations, while 2,282 have either closed or are intending to close.¹ We classified facilities that are planning to continue operations as operating facilities and facilities that have either closed or are intending to close as closing facilities. Facilities that are planning to continue operations but have closed or are intending to close some of their solid waste management units were also classified as operating facilities.

Of the 1,711 RFAS completed as of January 1990, 804 have been completed at operating land disposal, incinerator, or treatment and storage

¹EPA's data bases do not contain sufficient information on 154 facilities to allow us to determine if they are operating or closing facilities, nor if they are land disposal, incinerator, or treatment and storage facilities.

facilities, and 753 have been completed at closing land disposal, incinerator, or treatment and storage facilities.² Of the 804 operating facilities receiving an RFA, 652, or 81 percent, were found to require an RFI, while 152 were determined not to require an RFI. Of the 652 operating facilities requiring an RFI, 334, or 51 percent, have had an RFI imposed through either a permit or an enforcement order and 318 RFIs are pending. Of the 753 closing facilities receiving an RFA, 672, or 89 percent, were found to require an RFI, while the remaining 81 were determined not to require an RFI. Of the 672 facilities requiring an RFI, 207, or 31 percent, have had an RFI imposed through either a permit or an enforcement order and 465 are pending. Figure II.6 presents information on the operating and closing universe, the number of facilities that have received an RFA, the number of operating and closing facilities that have an RFI pending based on the results of the RFA, and the number that have an RFI imposed.

Figure II.6: Operating and Closing Facilities



²An additional 154 RFAs were completed. However, these were conducted at the 154 facilities that we are unable to classify as operating or closing facilities, or land disposal, incinerator, or treatment and storage facilities.

In addition to the 541 RFIs imposed at operating and closing facilities, 23 RFIs were imposed at facilities where the operating status was unknown. Of the total 564 RFIs imposed, 373 have been imposed through permits and 168 have been imposed through enforcement orders.³ EPA issues corrective action permits to impose RFIs at facilities that need permits to continue to operate or post-closure permits to close land disposal facilities. EPA uses corrective action orders to impose RFIs at closing incinerator, treatment and storage facilities and at operating facilities and closing land disposals where EPA wants to initiate corrective action prior to issuing permits. As shown in table II.1, 277 permits and 57 enforcement orders at operating facilities and 96 permits and 111 enforcement orders at closing facilities have been issued. Table II.1 also shows that most of the permits issued have been at operating and closing land disposal facilities, while most of the orders issued have been at closing land disposal facilities.

Table II.1: EPA's Use of Permits and Enforcement Orders to Initiate RFIs by Facility Type

Facility status	Instrument used to initiate RFI		Total
	Permit	Order	
Operating			
Land disposal	159	17	176
Incinerator	42	10	52
Treatment/storage	76	30	106
Subtotal	277	57	334
Closing			
Land disposal	95	102	197
Incinerator	0	1	1
Treatment/storage	1	8	9
Subtotal	96	111	207
Total	373	168	541^a

^aThis total does not equal the 564 facilities that have had an RFI imposed and that were cited earlier in this appendix. This discrepancy occurs because an additional 23 facilities have had permits or orders issued, but we were unable to classify these facilities as operating, closing, land disposal, incinerator, or treatment and storage facilities. At these 23 facilities, 5 permits and 18 corrective action orders were issued.

³Of the 564 permits and orders issued, 5 permits and 18 orders were imposed at 23 of the 154 facilities that we are unable to classify as operating or closing, land disposal, incinerator, or treatment and storage facilities.

Status of Corrective Action at Federal Facilities

Facilities owned by the federal government that handle hazardous waste are subject to RCRA hazardous waste requirements, including corrective action. Of the 4,615 facilities in the RCRA universe, 338 are federal facilities. In general, EPA's progress in completing RFAS and initiating RFIs at these facilities is comparable to the progress EPA has made at the overall universe of hazardous waste facilities. As of January 1990, 146, or 43 percent, of the 338 federal facilities have had an RFA completed. RFAS have not yet been completed for the remaining 192 federal facilities. Of the RFAS completed, 137, or 94 percent of the facilities, will require an RFI to investigate and determine if cleanup is necessary. Five federal facilities have progressed beyond the RFI stage and are studying clean up alternatives.

Universe of Federal Hazardous Waste Facilities

The Department of Defense's Air Force, Army, and Navy and the Department of Energy own 295, or 87 percent, of the 338 federal facilities. About 69 percent of the federal facilities are treatment and storage facilities, 24 percent are land disposals, and the remaining 7 percent are incinerators. Table III.1 shows which federal department, service, or agency owns the facilities, the number each owns, and the number of land disposal, incinerator, and treatment and storage facilities by ownership.

Table III.1: Ownership and Type of Federal Hazardous Waste Facilities

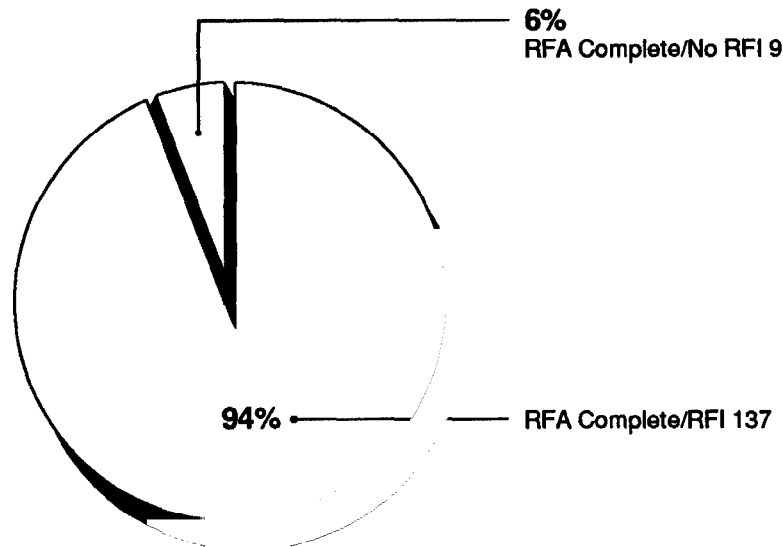
Agency/department	Number of facilities owned	Types of facilities		
		Land disposal	Incinerator	Treatment/storage
Army	93	21	12	60
Air Force	89	18	1	70
Navy	83	12	3	68
Energy	30	16	2	12
National Aeronautics and Space Administration	8	4	0	4
Transportation	6	4	0	2
EPA	5	0	2	3
Health and Human Services	5	3	1	1
Interior	5	0	1	4
Other ^a	14	4	1	9
Total	338	82	23	233

^aThis category includes a number of departments and agencies that individually own three or fewer facilities.

Progress in Assessing Federal Facilities

Progress in completing RFAs at federal facilities resembles that made at the overall universe of facilities. According to EPA's data bases, 146, or 43 percent, of the 338 federal facilities have had RFAs completed. As noted in appendix II, 37 percent of all facilities have had RFAs completed. For the remaining 192, or 57 percent, of the federal facilities, RFAs have not been completed and thus EPA does not know if these federal facilities' solid waste management units are causing or have the potential for causing releases. As shown in figure III.1, for the 146 RFAs completed, EPA has determined that 137, or 94 percent, required an RFI to investigate and determine if cleanup is necessary. For the remaining nine facilities with completed RFAs, EPA has determined that these facilities have little or no likelihood of a release at any of their units, and these nine facilities will not be subject to further investigation at this time.

Figure III.1: Federal Facilities Requiring
Corrective Action Based Upon RFA
Results



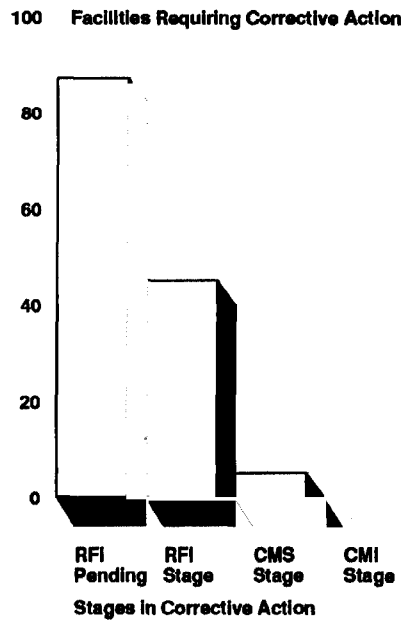
Progress in Cleaning Up Federal Facilities

As previously discussed, 137 federal facilities have had RFAs completed and have been determined to have solid waste management units that are leaking or have the potential to leak and require further study through an RFI. Of these 137 facilities, 87 facilities, or about 64 percent, have not been issued permits or enforcement orders requiring them to investigate. The remaining 50, or 36 percent, of the federal facilities have had RFIs imposed through either corrective action permits or

**Appendix III
Status of Corrective Action at
Federal Facilities**

orders. The percent of RFIS imposed at federal facilities is comparable to the percent of all facilities that have had RFIS imposed. As discussed in appendix II, 40 percent of all facilities requiring RFIS have had them imposed through permits or orders. Of the 50 federal facilities with RFIS imposed, 38 had RFIS imposed through corrective action permits and 12 through corrective action orders. As shown in figure III.2, 5 of the 137 facilities that have had RFAS completed and have been determined to require an RFI have progressed beyond the RFI stage and are in the CMS stage to study cleanup alternatives. No federal facility has advanced to the CMI stage.

**Figure III.2: Progress in Cleaning Up
Federal Facilities**



Staff Resources to Oversee Corrective Action Are Limited

The corrective action program requires significant regional office resources to complete RFAS, impose RFIS through either permits or orders, and oversee the facilities' corrective actions once RFIS are imposed. EPA's regional offices estimated that they used a total of 216 staff years in fiscal year 1989, or about twice the 117 staff years budgeted, for corrective action activities. Of these 216 staff years, we estimate that about 98 staff years were used to complete RFAS and issue permits and orders while about 118 staff years were used to maintain corrective action oversight at facilities that had RFIS imposed. Based on EPA headquarter's estimates, EPA regional offices would have needed over 300 staff years in fiscal year 1989, or more than two and one-half times what regions estimated using, to fully maintain corrective action oversight at assessed facilities where RFIS were imposed.

The shortfall of regional staff resources needed to maintain corrective action oversight responsibility in future years will worsen even though EPA is increasing the staff years allocated for overall corrective action. This deficiency will occur because EPA regional offices will be concentrating their corrective action staff resources on the assessment stage and imposing permits for facilities to address corrective actions to meet the 1992 permitting deadline rather than providing oversight for facilities that are in the RFI, CMS, or CMI stages. In fiscal year 1990, EPA budgeted 144 regional office staff years for corrective action activities, and is proposing 186 regional office staff years for fiscal year 1991. These increases are still below the 216 staff years the regions estimated they used in fiscal year 1989, which were insufficient to maintain corrective action oversight. If EPA intends to meet its November 1992 mandate and continues to use 216 staff years for corrective action, we estimate that almost all of the regional office corrective action staff years will have to be used for completing over 1,000 additional RFAS and RFIS. Completing these additional RFAS and RFIS would leave the regions, on average, with about 16 staff days per facility, or about 6 staff days per facility, per year, over the next 2-1/2 years to maintain corrective action oversight.

Resources Used to Oversee Corrective Action Are Below EPA's Recommended Levels

Oversight is a critical component of EPA's corrective action program. Oversight ensures that owner/operators conduct thorough RFIS, CMSS, and CMIS, and that cleanup is completed as planned. EPA headquarters estimates that regions should use 160 staff days¹, per year, to oversee each facility undergoing corrective action. Using regional estimates, however, we estimate that regions had available, on average, 61 staff days to oversee corrective action at each facility in fiscal year 1989.

EPA's 10 regional offices estimated that they used a total of 216 staff years during fiscal year 1989 to carry out the corrective action program, including (1) preparing RFAs or reviewing state or contractor prepared RFAs, (2) writing permits and permit modifications and enforcement orders, and (3) overseeing corrective action, including compliance monitoring and enforcement, at facilities that are in the RFI, CMS, or CMI stages. We estimate that about 98 of those 216 staff years were used to complete RFAs and/or issue permits or orders.² (Appendix V contains regional estimates of corrective action staff resources used in our calculations for this appendix. The questions are also included in appendix V.)

Because about 98 of the 216 staff years were used to complete or review state and contractor prepared RFAs and issue corrective action orders or permits, we estimated that EPA regional offices had about 118 staff years to oversee corrective action in fiscal year 1989. Through fiscal year 1989, 547 facilities had RFIS imposed and were in various stages of completing RFIS, CMSS, and CMIS. Therefore, we estimate that EPA regional offices had available, on average, 61 staff days per facility to oversee

¹EPA uses this 160 staff day figure to estimate the amount of resources necessary to oversee corrective action. It is based on the staff days used to oversee corrective action at hazardous waste facilities being cleaned up under EPA's Superfund program—a program to clean up abandoned or inactive hazardous waste sites, and a program for which EPA has more experience and data. While we did not evaluate whether the 160 staff day estimate is a realistic estimate of oversight resource needs for the corrective action program, EPA believes that it is the best estimate available at this time.

²This figure was obtained by multiplying the estimated average number of staff days reported by each region to complete or review a state or contractor completed RFA and the average number of days to complete a permit or order by the number of RFAs completed and the number of permits and orders issued by the regions in fiscal year 1989, respectively. These figures were then divided by 220 staff days and totaled. The 220 staff day figure is equal to 1 staff year for budget purposes.

corrective action.³ In fact, only 3 of the 10 regions reported spending, on average, 61 or more staff days overseeing corrective action at permitted facilities during fiscal year 1989. The 61 staff days of oversight is slightly over one-third of the 160 staff days per year that EPA headquarters estimates is needed to fully oversee corrective action at each facility. According to the number of staff days EPA estimates is needed to oversee corrective action, EPA regional offices would have required 308 staff years during fiscal year 1989, as opposed to the 118 staff years used, to conduct full oversight at the 547 facilities undergoing corrective action at that time.

Regional office officials told us that the level of resources they can commit to corrective action activities has already limited their ability to oversee corrective action. For example, Region 6 RCRA enforcement officials told us that because of limited resources, it will not be able to issue additional corrective action orders in fiscal year 1990. While staff are available to issue corrective action orders, staff are not available to oversee orders once they are issued. As a result, regional office officials told EPA headquarters that the region would not commit staff to issuing any additional corrective action orders during fiscal year 1990. RCRA permitting officials in regions 3, 4, 5, and 6 told us that resource limitations are having a negative impact on the facilities' abilities to proceed with corrective action. Staff are unable to review facility owner/operator submissions in a timely manner, and some reviews are delayed by as much as 6 months to 1 year. As a result, corrective action is delayed at a number of facilities, according to officials in regions 3, 4, and 6. Officials in regions 3, 4, 5, and 6 were concerned also about the quality of work performed by facility owner/operators, and the need for additional resources to oversee work conducted as corrective action progresses through the RFI, CMS, and CMI stages.

Oversight of corrective action by EPA encompasses all activities performed to manage the corrective action process, including contract management, negotiations, review of documents, site visits, preparation of comments, approvals or disapprovals of submittals, and analyses of

³This figure is based on the estimated number of staff days used for oversight and the number of facilities requiring oversight in fiscal year 1989. The staff days available were 25,960 (estimated at 118 staff years X 220 staff days per staff year). According to EPA data bases, 211 of the 547 facilities did not have an RFI imposed until sometime during fiscal year 1989, and, therefore, did not require oversight for the entire year. We assumed oversight began the quarter following when an RFI was imposed. For example, if an RFI was imposed at one of these 211 facilities during the second quarter, we counted this facility as one-half rather than one. Using this process, we calculated that these were the equivalent of 423 facilities requiring oversight for the entire year. We then divided the 25,960 staff days available by 423 to arrive at 61 staff days per facility.

samples. Because corrective action is carried out by facility owner/operators, independent oversight is even more critical to the success of the corrective action program. EPA needs to ensure, especially in states that are not currently authorized for corrective action, that facility owner/operators fully investigate the nature and extent of contamination at their sites, thoroughly explore the best measures to clean up contamination, and carry out the corrective measures selected by EPA, as designed and approved. Without sufficient oversight, EPA cannot be assured that releases are fully investigated or that cleanup methods selected are appropriate and, when implemented, will clean up releases occurring at hazardous waste facilities.

Staff Resources to Oversee Corrective Action Affected by Statutory Deadlines

If EPA intends to meet its statutory permitting deadline for all operating facilities (November 1992), regional offices will not be able to fully oversee corrective action at facilities already conducting RFIs, CMSS, or CMIS, without significant increases in regional staff resources above the 216 staff years used in fiscal year 1989. Oversight at facilities could fall to about 6 staff days per year over the next 2-1/2 years even if no additional facilities are required to initiate RFIs.

Table IV.1 shows that as of January 1990, 1,056 operating facilities still require an RFA and will probably require a corrective action permit, while 375 operating facilities that have had RFAs are pending the issuance of a corrective action permit. Thus, a total of 1,431 corrective action permits would have to be issued by November 1992 if EPA intends to meet its 1992 statutory permitting deadline for treatment and storage facilities and complete action on the overdue land disposal and incinerator facilities.

Table IV.1: RFAs and Corrective Action Permits Needed at Operating Facilities to Meet the Permitting Deadlines

Facility	Number of corrective action activities		Total to be permitted
	Corrective action permits pending as of January 1990	Estimated permits required at facilities where RFAs not yet completed as of January 1990 ^a	
Land disposal	83	43	126
Incinerator	46	50	96
Treatment and storage	246	963	1,209
Total	375	1,056	1,431

^aThese figures were obtained by multiplying the number of operating facilities that do not have RFAs completed (as identified in appendix II of this report) by the probability that an RFI was required in the past, at land disposal, incinerator, or treatment and storage facilities 90 percent, 83 percent, and 76 percent, respectively).

**Appendix IV
Staff Resources to Oversee Corrective Action
Are Limited**

We estimated that if EPA's regions use the same number of staff days as they estimate were used to conduct and review RFAs and issue corrective action permits and orders during fiscal year 1989, the agency will need about 500 staff years to meet the 1992 treatment and storage permitting deadline and past land disposal and incinerator deadlines.⁴ If the regions continue to devote the same amount of resources to corrective action as they did in fiscal year 1989 (216 staff years), all but about 40 of the total number of staff years available over the next 2-1/2 years would have to be devoted to completing RFAs and issuing corrective action permits at operating facilities if the permitting deadlines are to be met. Clearly, as more facilities are assessed and permits are issued, the number of facilities requiring oversight will be greater than the 547 facilities requiring oversight at the end of fiscal year 1989. But even with 547 facilities requiring oversight, regions could spend, on average, only about 16 staff days per facility, or about 6 staff days per facility, per year, over the next 2-1/2 years to oversee corrective action.

Once EPA meets its deadline for permitting operating facilities, EPA will also require staff resources to conduct assessments and issue corrective action permits or orders at the remaining 2,096 closing facilities still requiring RFAs, corrective action orders and/or permits. These staff resources would be needed in addition to the staff resources necessary to oversee the nearly 2,000 facilities (1,431 facilities not yet permitted in addition to the 547 currently requiring oversight) that may require oversight by November 1992.

We recognize that four states are currently authorized for corrective action, thereby reducing the burden placed on EPA's resources to issue permits and oversee corrective action in those four states. We also recognize that additional states will be authorized between January 1990 and November 1992. However, unknown is the number of states that will receive authorization and the amount of resources authorized states will be able to commit to conducting RFAs, issuing permits, and overseeing corrective action. We also recognize that some states that are not currently authorized do commit staff resources to corrective action and

⁴Two assumptions were made to derive this estimate. First, we assumed states and contractors would conduct the same proportion of the remaining RFAs as they conducted during fiscal year 1989 (about 80 percent). Second, we assumed that the same proportion of RFAs completed in the future would result in a corrective action permit as occurred in the past (by type of facility). This allowed us to estimate the number of outstanding RFAs that will also need corrective action permits by 1992. The number of RFAs to be completed or reviewed and the number of permits to be issued were multiplied by the average number of staff days needed to complete these activities in fiscal year 1989. In total, the number of staff years needed to complete RFAs and permit operating facilities by 1992 was estimated to be 501.

that this allocation reduces the staff resource burden on EPA. While we attempted to obtain information on the amount of state staff resources used for corrective action, data were not available. As a result, our analyses do not include state staff resources.

Staff Years Budgeted for Fiscal Year 1990 and Proposed for 1991 Are Not Sufficient for Corrective Action Oversight

Corrective action regional staff years budgeted by EPA for fiscal year 1990 and proposed for fiscal year 1991 are below the estimated staff years used by the regions in fiscal year 1989, and will result in less than full oversight of corrective action for facilities that are in the RFI, CMS, and CMI stages. As previously discussed, EPA budgeted a total of 117 regional staff years for corrective action in fiscal year 1989, but EPA regions reported using about 216 staff years for corrective action, of which about 98 were used by the regions to prepare or review state or contractor prepared RFAs and issue corrective action permits and orders. For fiscal year 1990, EPA has budgeted 144 staff years for corrective action, including oversight, and has proposed to use 186 staff years during fiscal year 1991. If regions continue dedicating the same amount of staff years (98) in fiscal years 1990 and 1991 to prepare and review RFAs and issue corrective action permits and orders as they did in fiscal year 1989, they will not have sufficient staff years to fully oversee corrective action.

However, it is unlikely that the regions will only use 98 staff years during fiscal year 1990, and again in 1991, to complete RFAs and issue permits. As discussed previously, we estimate that EPA regions would require about 500 staff years total during fiscal years 1990 through 1992, or about 167 staff years each fiscal year to complete RFAs and issue corrective action permits if EPA intends to meet its 1992 statutory permitting deadline and complete action at facilities under prior deadlines. The 1990 budgeted corrective action staff years and the 1991 proposed staff years will result in no staff years during fiscal year 1990 and limited staff years in 1991 to oversee the 547 facilities requiring oversight at the end of fiscal year 1989 and some of the additional 1,431 facilities requiring permits by November 1992.

Regional Office Staff Day and Staff Year Estimates Used for RCRA and Corrective Action

To obtain information on the resources used to carry out corrective action, we sent a questionnaire to each of EPA's 10 regional offices and asked them to provide us information on the number of staff days and staff years they committed to corrective action during fiscal year 1989, in comparison with the total number of staff years used to implement other RCRA hazardous waste activities that year. We also asked the regional offices to estimate the number of staff days required to complete and/or review an RFA, issue a corrective action permit or order, and conduct oversight at a facility.

Information we requested from and questions we posed to regional office officials are presented below, followed by a table charting their responses.

**Appendix V
Regional Office Staff Day and Staff Year
Estimates Used for RCRA and
Corrective Action**

Question: Please list for fiscal year 1989 (estimates, if necessary):

a. The number of FTEs (staff years) of EPA professional staff in your region actually used in activities under the Corrective Action program (including preparing/reviewing RFAS, writing permits, permit modifications, compliance monitoring, oversight, and enforcement). Count only professional staff here, do not include administrative staff. To count FTEs, if for example, two staff people spend about half their time working on Corrective Action program activities this would count as $1/2 + 1/2 = 1$ FTE.

b. The number of FTEs (staff years) of EPA administrative staff in your regions (including support work for RFAS, permits, permit conditions, compliance monitoring, oversight, and enforcement). Count only administrative staff here—do not include professional staff. Count FTEs in the same manner as above.

c. The number of FTEs (staff years) of EPA professional staff in your regions actually used in activities not under the Corrective Action program. Again, do not include administrative staff here. Count FTEs in the same manner as above.

d. The number of FTEs (staff years) of EPA administrative staff in your region actually used in activities not under the Corrective Action program. Do not include professional staff here. Count FTEs in the same manner as above.

Table V.1: Number of Staff Years Used for RCRA and Corrective Action Program Activities

EPA region	Total RCRA staff years	Staff years used for corrective action program activities	Staff years used for other RCRA program activities
1	52	14	38
2	72	16	56
3	66	27	39
4	93	34	59
5	133	43	90
6	107	24	83
7	70	21	49
8	46	13	33
9	87	15	72
10	52	9	43
Total	778	216	562

**Appendix V
Regional Office Staff Day and Staff Year
Estimates Used for RCRA and
Corrective Action**

Question: On average, about how much time does it take for EPA staff (professional and administrative/support) to complete and/or review an RFA for one facility in your region? (Enter number of staff days. If less than one full staff day, enter fraction. If none, enter zero.)

Table V.2: Number of Regional Staff Days to Complete an RFA or Review a Contractor or State Drafted RFA

Region	Type of facility	Total staff to complete an RFA ^a	Total staff days to review contractor or state drafted RFA
1	Land disposal	b	20.0
	Incinerator	b	20.0
	Treatment/storage	b	20.0
2	Land disposal	30.5	15.5
	Incinerator	48.0	33.0
	Treatment/storage	30.5	15.5
3	Land disposal	165.0	60.0
	Incinerator	165.0	60.0
	Treatment/storage	99.0	36.0
4	Land disposal	23.0	12.0
	Incinerator	23.0	12.0
	Treatment/storage	23.0	12.0
5	Land disposal	28.0	5.0
	Incinerator	28.0	5.0
	Treatment/storage	28.0	5.0
6	Land disposal	40.0	10.0
	Incinerator	33.5	6.0
	Treatment/storage	23.5	4.0
7	Land disposal	45.0	21.0
	Incinerator	45.0	21.0
	Treatment/storage	35.0	16.0
8	Land disposal	67.0	12.0
	Incinerator	45.0	6.0
	Treatment/storage	18.0	4.0
9	Land disposal	c	10.0
	Incinerator	c	5.0
	Treatment/storage	c	5.0
10	Land disposal	35.0	6.0
	Incinerator	35.0	6.0
	Treatment/storage	35.0	6.0

^aIncludes professional and administrative/support staff days.

^bRegion 1 contracts out all RCRA facility assessments.

^cData was not provided by Region 9.

**Appendix V
Regional Office Staff Day and Staff Year
Estimates Used for RCRA and
Corrective Action**

Question: On average, about how much time does it take for EPA staff (professional and administrative/support) to issue the corrective action portion of a permit or corrective action order for one facility in your region? (Enter number of staff days. If less than one full staff day, enter fraction. If none, enter zero.)

Table V.3: Estimated Number of Staff Days to Complete the Corrective Action Portion of a Part B Permit

Region	Total staff days for land disposal facility ^a	Total staff days for incinerator facility ^a	Total staff days for treatment and storage facility ^a
1	80.0	80.0	80.0
2	29.0	29.0	29.0
3	150.0	90.0	70.0
4	18.0	18.0	18.0
5	95.0	95.0	95.0
6	37.0	37.0	30.0
7	55.0	55.0	45.0
8	82.0	55.0	43.0
9	80.0	80.0	80.0
10	60.0	60.0	60.0

^aIncludes both professional staff days and administrative/support staff days.

Table V.4: Estimated Number of Staff Days to Issue a Corrective Action Order

Region	Total staff days for land disposal facility ^a	Total staff days for incinerator facility ^a	Total staff days for treatment and storage facility ^a
1	80.0	80.0	80.0
2	29.0	29.0	29.0
3	114.0	114.0	114.0
4	18.0	18.0	18.0
5	95.0	95.0	95.0
6	60.0	60.0	60.0
7	85.0	85.0	85.0
8	82.0	55.0	43.0
9	80.0	80.0	80.0
10	60.0	60.0	60.0

^aIncludes both professional staff days and administrative/support staff days.

**Appendix V
Regional Office Staff Day and Staff Year
Estimates Used for RCRA and
Corrective Action**

Question: On average, about how much time is spent over the course of one year by EPA staff (professional and administrative/support), in oversight of corrective action (RFI, CMS, CMI) at one facility in your region? (Enter number of staff days. If less than one full staff day, enter fraction. If none, enter zero.)

Table V.5: Estimated Number of Staff Days Spent, Per Year, by EPA Staff in Oversight of Corrective Action, Per Facility

Region	Total staff days ^a spent overseeing corrective action at one facility
1	160.0
2	120.0
3	5.0
4	23.0
5	37.5
6 ^b	61.5
7	57.0
8	78.0
9	47.5
10	32.0

^aIncludes both professional and administrative staff days.

^bRegion 6 separated out staff days to oversee a permit versus a corrective action order. Staff days to oversee an order were greater than those to oversee a permit. Permit and order staff day estimates were combined and averaged to obtain a single value for this table.

**Appendix V
Regional Office Staff Day and Staff Year
Estimates Used for RCRA and
Corrective Action**

Question: Please enter the number of RFAs and permits/orders that were completed in your region by EPA staff, by contractors, or by the states in fiscal year 1989. (Enter number. If none, enter zero.)

Table V.6: Number of RFAs Completed and Permits and Orders Issued During Fiscal Year 1989

Corrective action activities	Regions										Total
	1	2	3	4	5	6	7	8	9	10	
RFAs											
EPA staff	0	0	0	20	45	0	1	0	0	5	71
Contractors	3	44	32	49	23	18	17	17	0	0	203
State	0	28	8	38	7	17	5	0	0	0	103
Total RFAs	3	72	40	107	75	35	23	17	0	5	377
Permits											
EPA staff	3	13	11	34	20	12	7	1	0	11	112
Contractors	0	0	0	0	0	0	0	0	0	0	0
State	0	0	0	18	1	23	0	1	0	0	43
Total permits	3	13	11	52	21	35	7	1	0	11	155
Orders											
EPA staff	6	3	24	29	10	4	9	5	22	5	117
Contractors	0	0	0	0	0	0	0	0	0	0	0
State	0	0	0	0	0	0	0	0	0	0	0
Total orders	6	3	24	29	10	4	9	5	22	5	117

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