

December 1987

SUPERFUND

Extent of Nation's Potential Hazardous Waste Problem Still Unknown



RESTRICTED—Not to be released outside the General Accounting Office except on the basis of specific approval by the Office of Congressional Relations.

540866



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

**Resources, Community, and
Economic Development Division**

B-226922

December 17, 1987

The Honorable Thomas A. Luken
Chairman, Subcommittee on Transportation,
Tourism and Hazardous Materials
Committee on Energy and Commerce
House of Representatives

The Honorable James J. Florio
House of Representatives

As you requested, this report estimates the potential universe of hazardous waste sites, discusses the efforts of EPA and the states in identifying and reporting potential hazardous waste sites, and reports on the status of sites GAO reported in 1985 as missing from EPA's inventory.

Unless you publicly release its contents earlier, we will make this report available to other interested parties 30 days after the date of this letter. At that time, copies of the report will be sent to appropriate congressional committees; the Administrator, Environmental Protection Agency; and the Director, Office of Management and Budget.

This work was performed under the direction of Hugh J. Wessinger. Other major contributors are listed in appendix I.

A handwritten signature in cursive script that reads 'J. Dexter Peach'.

J. Dexter Peach
Assistant Comptroller General

data, that as many as 425,000 sites may need to be evaluated, compared with about 27,000 in CERCLIS, of which a small portion is expected to become NPL sites.

Nevertheless, EPA continues to give low priority to helping states identify and inventory new sites. Federal leadership, guidance, and money has been generally nonexistent. As a result, state site identification programs vary considerably. Further, despite GAO's past recommendations, EPA has done little to improve reporting of known sites. Well over half the sites in five states that were missing from CERCLIS at the time of GAO's earlier review are still not listed.

GAO agrees with EPA that it should give high priority to the timely assessment and cleanup of sites already on CERCLIS and the NPL. However, GAO believes that EPA needs to strike a better balance between assessing and cleaning up existing sites and assuring that reasonable efforts are being made to uncover, inventory, and assess potential new sites. The importance of such an approach is underscored by the estimated large number of additional potential sites.

Principal Findings

Potential Hazardous Waste Sites

GAO's latest estimate of the universe of potential hazardous waste sites ranges from 130,000 to 425,000 sites, which is generally consistent with the estimate of 131,000 to 379,000 contained in GAO's 1985 report. In contrast, EPA's CERCLIS inventory currently only contains about 27,000 potential hazardous waste sites, roughly 7,000 more than it contained in 1985.

Although the 1985 and 1987 estimates of potential sites are similar, the current estimate includes additional site categories. For example, over 5,400 federal facility sites are now part of the latest estimate, and 32 such sites are already on the NPL. (See ch. 2.)

State Inventory Programs

The Resource Conservation and Recovery Act of 1976, which authorizes the regulation of facilities that handle hazardous waste, requires each state to continually compile an inventory of all sites at which hazardous wastes were stored or disposed of and to report the results to EPA. Under

section 3012, if EPA finds that a state's program is inadequate, the agency is required to take it over.

Although EPA uses these state programs as the basis for its CERCLIS inventory, and ultimately the NPL, it has offered the states little direction, guidance, or money to conduct site identification. In addition, EPA has not reviewed any state program to determine whether it is adequate, nor has it developed criteria for evaluating these programs. As a result, although all states have site identification programs, they vary considerably: some states rely solely on citizen reports of potential sites, while others actively seek out sites through comprehensive surveys.

EPA recognizes that there may be many more hazardous waste sites than those already discovered, but it believes that meeting the 4-year legislative deadline for evaluating sites on CERCLIS is a higher priority. To meet these deadlines, EPA believes it must limit its grants to states to evaluating reported sites, without providing any grant money for site discovery. Recognizing the importance of evaluating and cleaning up known sites, GAO nevertheless believes that EPA, the Congress, and the public need to be aware of the full extent of the nation's hazardous waste problem in order to make informed decisions about national cleanup issues. (See ch. 3.)

Reporting Potential Hazardous Waste Sites

As it told GAO in 1985, EPA considers it important to have a complete inventory of sites that are believed to contain hazardous wastes in order to determine which sites are most in need of federal cleanup. Even if states are pursuing cleanup action, EPA officials said that the agency needs to evaluate a site to see if it belongs on the NPL or whether emergency removal actions are needed.

This view is not reflected in formal EPA policy, however, and EPA regions and the states have been given no instructions or guidance on when to add sites to CERCLIS. As a result, EPA's inventory still does not contain all of the sites identified by the states. In its 1985 report, GAO found that 837 sites, including 7 that state officials thought might be serious enough to qualify for the NPL, had been discovered by the states but were not included in CERCLIS. As of March 1987, 494 of these sites were still missing from the inventory, including 3 of the potential NPL candidates. Of the total number missing, 262 are in California, 103 in Connecticut, 126 in New York, 2 in Texas, and 1 in Louisiana.

In most of these cases, the sites were reported or known to EPA, but EPA regional officials did not add them to CERCLIS. Instead, they added to CERCLIS only the number of sites for which they had evaluation funds. The officials explained that the 4-year legislative deadline for evaluating CERCLIS sites makes it necessary to limit the size of CERCLIS to the number of sites they can afford to evaluate. In other cases, states did not report sites to EPA because they (1) wanted to first verify the presence of hazardous wastes, (2) believed that they could get responsible parties to clean them up more quickly and at less cost if EPA was not involved, or (3) felt obliged to report only sites eligible for federal cleanup.

In its 1985 report, GAO recommended that EPA encourage the states to report the existence of hazardous sites and emphasize to its regions the need to incorporate into CERCLIS the sites identified by the states. Although EPA agreed with these recommendations, it nevertheless continues to view this issue as a low priority and has not developed a formal CERCLIS reporting policy or issued any instructions or guidance either to its regions or to the states. As a result, CERCLIS is becoming more a reflection of the amount of money EPA has allocated to site evaluations than an indication of the nation's potential hazardous waste problem, as the Congress intended it to be. (See ch. 4.)

Recommendations

To provide a more complete picture of the nation's hazardous waste problem, GAO recommends that the Administrator, EPA, develop guidelines and criteria for assessing state hazardous waste site identification programs and evaluate them according to these criteria. As part of these evaluations, EPA should examine the states' need for federal funding or other forms of assistance. (See ch. 3.)

Further, the Administrator should issue a formal policy, to be followed by the regions and the states, on when and what types of sites should be added to CERCLIS. (See ch. 4.)

Agency Comments

During the course of its review, GAO discussed its findings with EPA and state officials; their comments are incorporated where appropriate. As directed by the Subcommittee Chairman, GAO did not ask EPA or the states to comment officially on a draft of this report.

Contents

<hr/>	
Executive Summary	2
<hr/>	
Chapter 1	8
Introduction	
Background	8
Identifying and Evaluating Potential Hazardous Waste Sites	9
GAO Reviews of EPA's National Hazardous Waste Site Inventory	10
Objectives, Scope, and Methodology	10
<hr/>	
Chapter 2	13
Number of Categories of Potential Hazardous Waste Sites Has Grown	
EPA's CERCLIS Inventory	13
Estimates of Potential Hazardous Waste Sites	13
Conclusions	21
<hr/>	
Chapter 3	22
EPA Provides Little Support to State Site Discovery Programs	
State Site Discovery Programs	22
EPA Has Given Little Assistance to State Site Discovery Efforts	27
EPA Is Not Exercising Oversight of State Programs	28
Conclusions	29
Recommendations	30
<hr/>	
Chapter 4	31
EPA's Hazardous Waste Site Inventory Continues to Be Incomplete	
Status of Sites Previously Not in CERCLIS	31
EPA Does Not Have a CERCLIS Policy	32
EPA Has Not Been Responsive to GAO Recommendations	37
Conclusions	37
Recommendations	38
<hr/>	
Appendix	40
Appendix I: Major Contributors to This Report	40
<hr/>	
Tables	
Table 2.1: Types and Numbers of Potential Hazardous Waste Sites	14
Table 3.1: State Site Discovery Methods	23

Contents

Table 4.1: Status of Sites in Five States Previously Not Included in March 1985 CERCLIS Inventory	32
Table 4.2: Sites Not Included in CERCLIS Inventory, Reported and Unreported	33

Abbreviations

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
EPA	Environmental Protection Agency
ERRIS	Emergency and Remedial Response Information System
GAO	General Accounting Office
PCBs	polychlorinated byphenyls
RCED	Resources, Community, and Economic Development Division
RCRA	Resource Conservation and Recovery Act
NPL	National priorities list
SARA	Superfund Amendments and Reauthorization Act
TSDf	Treatment, Storage, and Disposal Facility

Introduction

The Congress enacted the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), also called Superfund, to clean up the nation's hazardous waste sites. The law requires owners and operators to report to the Environmental Protection Agency (EPA) all facilities at which hazardous substances have been stored, treated, or disposed of. In other legislation, the Congress also directed the states to prepare and submit to EPA inventories of all their potential hazardous waste sites. EPA has compiled this information in a national inventory from which it determines the sites that qualify for federal cleanup.

In 1985, we reported that EPA's inventory was far from complete, in part because EPA did not have an aggressive site discovery program. We also found that the states and EPA were not including all known sites in the inventory. To determine EPA's progress since then, the Chairman, Subcommittee on Transportation, Tourism and Hazardous Materials, House Committee on Energy and Commerce, asked us to again review the efforts of both EPA and the states in identifying hazardous waste sites.

Background

Following the discovery of serious health and environmental problems at Love Canal and other communities around the country, the Congress began to address the problem of cleaning up contamination caused by hazardous wastes. CERCLA provides the legal and financial mechanisms for cleaning up the worst of these hazardous waste sites. It makes all owners and operators of hazardous waste disposal and storage facilities, as well as generators and certain transporters of hazardous wastes, liable for all cleanup costs. To pay for cleanup until responsible parties can be located, or if they are unable to pay, the law established a \$1.6 billion, 5-year trust fund, which was supplemented in 1986 by \$8.5 billion and extended for another 5 years.

CERCLA also requires EPA to develop a national contingency plan for responding to releases of hazardous substances. Among other things, the plan is to include methods for discovering and investigating potential hazardous waste sites and criteria for determining priorities among releases or threatened releases at those sites. As part of the plan, EPA was to develop a national priorities list (NPL) of those sites considered to present the most serious threats to public health and the environment. Although not restricted by CERCLA, the national contingency plan limits the use of the trust fund, or Superfund, to cleaning up only those sites listed on the NPL. Cleanup at all other hazardous waste sites (other than at federal facilities) is left to the states.

Identifying and Evaluating Potential Hazardous Waste Sites

EPA's national contingency plan refers to several statutory reporting requirements as the means by which the agency can identify hazardous waste sites. Section 103(c) of CERCLA required all past and present owners and operators of facilities where hazardous substances were stored, treated, or disposed of to notify EPA by June 1981 of the existence of such facilities and of any known, suspected, or likely releases of hazardous substances at those facilities. Following the reporting deadline, EPA received 11,000 reports of such facilities. Section 103(a) also requires that EPA be notified of any significant releases of hazardous substances as they occur.

The Congress also added reporting requirements in amendments to the Resource Conservation and Recovery Act of 1976 (RCRA). Among other things, RCRA authorizes the regulation of hazardous wastes at facilities where they are currently generated, treated, stored, or disposed of. Section 3012, added in 1980, required states to establish ongoing programs for identifying hazardous waste sites and reporting them to EPA. The Congress also authorized grants to states to assist them in their efforts.

Using these and other sources, EPA compiled a national inventory of hazardous waste sites. Originally known as the Emergency and Remedial Response Information System, (ERRIS) the data base first contained 9,500 sites. In 1985, it was merged with other data bases to become the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS). According to EPA, only those sites listed in CERCLIS will be evaluated and considered for inclusion in the NPL.

Once a site has been entered into CERCLIS, it is evaluated—either by EPA or by the state under a cooperative agreement with EPA—to determine whether hazardous substances are uncontained and are contaminating soil, groundwater, or the air. The evaluation progresses through a series of assessments, each more detailed. The first step, a preliminary assessment, uses readily available information to determine whether emergency action is called for, additional investigation is needed, or no further action is necessary. If the assessment reveals a problem, the site will be inspected to determine if there is any immediate danger to persons living or working nearby. The site inspection may also include monitoring, surveys, and tests.

This information is then used to determine if the site should be listed on the NPL. To be included, the site must score above a threshold level on EPA's Hazard Ranking System, or it may be designated by a state as its highest priority. EPA may also list a site if the Department of Health and

Human Services has issued a health advisory in connection with it. CERCLA stipulates that the NPL contain at least 400 sites; as of July 1987, it contained 802 sites, with an additional 149 proposed for inclusion. Historically, up until 1984, roughly 8 percent of CERCLIS sites were added to the NPL. According to EPA Superfund officials, EPA has not updated this analysis.

Under the Superfund Amendments and Reauthorization Act of 1986 (SARA), EPA is required to meet certain schedules for evaluating candidate sites for the NPL. By the end of 1987, it must complete preliminary assessments for all sites listed on CERCLIS as of October 1986, the date of SARA's enactment. Any necessary inspections must be completed by the end of 1988. EPA must complete all evaluations by October 1990, having determined by then which CERCLIS sites should be placed on the NPL. For all sites listed on CERCLIS after October 1986, evaluations must also be completed within 4 years of their listing.

GAO Reviews of EPA's National Hazardous Waste Site Inventory

In two previous reports, we reviewed EPA's progress in identifying hazardous waste sites and concluded that its national inventory was incomplete. In 1982, we reported that EPA had not requested the funds authorized by the Congress to compile statewide inventories and recommended that it do so.¹ In a March 1985 report, we found that EPA's inventory could contain many more sites—from 130,000 to over 378,000—but EPA was concentrating its resources on evaluating and cleaning up known sites rather than searching for new ones.² We also found that not all known sites were being added to CERCLIS, either because states were not reporting them to EPA or because EPA regional offices were not entering them into CERCLIS. In the 5 states we visited, more than 800 known sites were not listed on CERCLIS for one of these reasons, including several sites that state officials thought could qualify for the NPL.

Objectives, Scope, and Methodology

On June 16, 1986, the Chairman, Subcommittee on Transportation, Tourism and Hazardous Materials, House Committee on Energy and Commerce, requested that we study the extent to which EPA has

¹Environmental Protection Agency's Progress in Implementing the Superfund Program (GAO/CE-82-91, June 2, 1982).

²EPA's Inventory of Potential Hazardous Waste Sites Is Incomplete (GAO/RCED-85-75, March 26, 1985).

increased its site discovery efforts since our March 1985 report.³ In particular, he asked us to determine

- the total possible number and types of sites that may need to be studied to obtain a comprehensive inventory of potential hazardous waste sites;
- the status of the 837 sites we reported were discovered in 5 states but not included in CERCLIS;
- what actions have occurred at those sites the 5 states reported as being serious enough to be placed on the NPL but were not; and
- the extent to which other states are developing comprehensive inventories of their hazardous waste sites.

To determine the number and types of sites that may need to be studied, we reviewed EPA's report to the Congress on the extent of the hazardous release problem⁴ and other EPA studies. We met with EPA Superfund and other program managers to discuss and obtain EPA's most recent estimates of the number of sites in each category.

For two of these categories—federal facilities and mining and mineral processing facilities—we did not use EPA estimates. We obtained documents including estimates of the number of sites at defense facilities from officials of the Department of Defense; estimates of civilian sites came from a GAO review of civilian agencies that we reported on in July 1987.⁵ Our estimates of mining sites were based upon EPA criteria for mining wastes and U.S. Bureau of Mines data on active and permanently closed mines and mineral processing facilities in the United States. For all categories of sites, we reviewed our estimates with officials and staff of EPA's Hazardous Site Evaluation division, the office within the agency responsible for the national hazardous waste site inventory. We did not determine the accuracy of the data obtained nor the reasonableness of the methodology used in studies conducted by EPA or its contractors.

To follow up on the status of the sites we had earlier reported as missing from CERCLIS, we returned to the 5 states in which they were located and

³At the time of the request, the subcommittee was called the Subcommittee on Commerce, Transportation, and Tourism and was chaired by Congressman James J. Florio. This report is addressed to both the former and current subcommittee chairmen.

⁴Extent of the Hazardous Release Problem and Future Funding Needs, CERCLA Section 301(a)(1)(c) Study, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, December 1984.

⁵Superfund: Civilian Federal Agencies Slow to Clean Up Hazardous Waste (GAO/RCED-87-153, July 24, 1987)

the EPA offices in those regions. These included California and Region IX in San Francisco; Connecticut and Region I in Boston; Louisiana and Texas, both in Region VI in Dallas; and New York and Region II in New York City. In California and New York, we compared the number of sites reported missing in our 1985 report with the number on CERCLIS in late 1986 and early 1987. In Connecticut, Louisiana, and Texas, where we were able to identify each of the missing sites in 1985, we checked the CERCLIS lists in late 1986 and early 1987 to see which sites had been entered.

We then discussed with the state and EPA officials responsible for hazardous waste site identification and evaluation the reasons why sites were still missing. The officials also furnished us with reports and other documents pertaining to their procedures for reporting sites to EPA, the laws in their states governing site discovery and cleanup, and their programs for identifying hazardous waste sites and compiling inventories.

Our information on the extent to which other states are developing hazardous waste site inventories was based largely on a report prepared for EPA by Booz-Allen and Hamilton, Inc.⁶ We supplemented this information with interviews with state officials and with staff of the Hazardous Site Control Division of EPA's Superfund Office.

We conducted our review between August 1986 and August 1987 in accordance with generally accepted government auditing standards. In keeping with the Chairman's request, we did not ask EPA or the states for their official review and comment on a draft of this report. Instead, we sought the views of state and EPA officials with responsibility for Superfund activities and incorporated their views into the report where appropriate.

⁶A National Study of Site Discovery Methods, Booz-Allen and Hamilton, Inc., (EPA Contract 68-01-6888, March 1987).

Number of Categories of Potential Hazardous Waste Sites Has Grown

Since our 1985 report, the number of potential hazardous waste sites in EPA's inventory, has grown, but is still much smaller than the 130,300 to 425,400 sites we estimate may have to be evaluated. This range is roughly the same as EPA's 1984 estimate, but includes several new categories of facilities and sites. Many of the newly suspected sites may be contaminated leaking underground injection wells or other sources. Until suspected sites are added to CERCLIS, they will not be evaluated, and the extent of the nation's hazardous waste problem cannot be accurately assessed.

EPA's CERCLIS Inventory

As of August 1987, EPA's CERCLIS inventory had grown to include 27,200 potential hazardous waste sites, nearly 7,000 more than the 20,375 listed in its inventory in March 1985 when it was known as the ERRIS inventory. According to EPA officials, most of the additional sites were reported by the states, with some sites added as a result of special EPA studies. While all states, territories, and the District of Columbia reported sites to EPA during this period, 10 states accounted for nearly two-thirds of the additions. The greatest number of new sites reported was in California, up from about 1,050 to 1,750 between 1985 and 1987, for an increase of 700 sites. Texas reported over 500 new sites, bringing its total to 2,125; Pennsylvania added about 600 sites to its March 1985 total of 1,437. New Jersey, New York, Florida, Illinois, Indiana, Michigan, and Missouri each added from 256 to 481 sites to CERCLIS between 1985 and 1987.

Estimates of Potential Hazardous Waste Sites

On the basis of EPA and other federal agency data, we estimate there may be 130,300 to 425,400 potential hazardous waste sites altogether that qualify for inclusion on the CERCLIS inventory.¹ While the overall totals are similar to the estimates developed by EPA in 1984 and discussed in our 1985 report, the estimated number of sites in some categories has decreased—particularly, underground storage tanks—while, at the same time, new potential sources of hazardous waste problems have been identified. In EPA's view, only a small portion of the estimated number of sites will actually be found to require cleanup.

As table 2.1 shows, we have added six new categories of potential hazardous waste sites to those in our earlier report. Most of these categories were identified in EPA studies as likely sources of additional CERCLIS sites. We have also added underground injection wells as a category because

¹Estimates include an unknown number of CERCLIS sites.

**Chapter 2
Number of Categories of Potential Hazardous
Waste Sites Has Grown**

they are generally unregulated and may contain hazardous wastes. In any case, sites within all six categories are currently listed on CERCLIS and either proposed for or on the NPL.

Landfills and other disposal facilities that received hazardous wastes in the past and continue to receive them in small quantities remain a significant cause of concern. Other potentially large categories may be mining waste sites and underground injection wells. This chapter discusses these and other types of problems.

Table 2.1: Types and Numbers of Potential Hazardous Waste Sites

	1985	1987 ^a
Waste facilities		
nonhazardous (RCRA subtitle D)	109,000–127,000 ^b	70,419–261,930
hazardous (RCRA subtitle C) ^c	605	818
Mining waste sites	9,770–63,770	22,339
Underground storage tanks, (non-petroleum)	11,250–187,500	10,820
Pesticide-contaminated sites	•	3,920 ^d
Federal facility sites		
civilian	•	1,882 ^e
defense	•	3,526
Radioactive releases	•	300
Underground injection wells	•	13,839–117,368
Town gas facilities	•	1,502
Wood preserving plants	•	975
Total	130,625–378,875	130,340–425,380

^aEstimates based on latest available data. (See text for additional information.)

^bMunicipal and industrial landfills only; does not include other types of subtitle D facilities included in 1987 estimates.

^cProjected failures of facilities under RCRA financial assurance requirements.

^dNumber of sites in six states where pesticide levels are known to exceed state standards.

^eIncludes 171 municipal landfills or dumps that may also be included in the estimates of RCRA subtitle D facilities.

Waste Facilities

Under RCRA, waste facilities are categorized as either hazardous or non-hazardous. Only permitted facilities, referred to as treatment, storage, and disposal facilities (TSDF), are allowed to handle hazardous wastes; these are regulated under subtitle C of the law. Nonhazardous waste facilities, which generally fall under the provisions of RCRA subtitle D, include municipal and industrial landfills, surface impoundments, land

application units, and waste piles.² Although these facilities may not currently receive hazardous wastes unless permitted under subtitle C, they may have received hazardous wastes in the past and may in fact continue to receive small quantities from households and small quantity generators.

Although subtitle C facilities may have uncontained hazardous wastes that are causing environmental contamination, it is EPA's policy to consider them for the NPL only if the owners or operators are unwilling or unable to take corrective action. According to estimates that EPA developed for us in July 1987, over 50 percent, or about 2,500 of the approximately 4,800 TSDFs may have some form of leakage requiring cleanup. EPA further estimated that some owners and operators will be unwilling or unable to cleanup about one-third of those 2,500 TSDFs. On the basis of this estimate, EPA now projects that 818 TSDFs may be candidates for inclusion in the CERCLIS inventory.

The estimates of nonhazardous waste, or subtitle D, facilities that may require cleanup are far less precise, although there appear to be more than were reported in 1985. Altogether, there are reported to be 261,930 nonhazardous waste facilities in the United States, both active and closed. These do not have to have EPA permits to operate, however, and only half of the 227,127 operating facilities are subject to any state permitting requirements. Although 58 percent of subtitle D operating facilities are reported to have inspections at least once a year, only about one-third were actually inspected in 1984, and only 5 percent had groundwater monitoring systems. Many of these facilities existed before hazardous waste disposal was regulated, and any of them could be receiving hazardous wastes from companies or households that generate unregulated small quantities. EPA and the states have already found serious contamination problems at some of these types of facilities, including 184 subtitle D landfills on the NPL.

For these reasons, EPA and state officials suspect that hazardous wastes may be present, in some amount, at virtually all of the estimated 261,930 subtitle D facilities. Of these, 70,419 facilities, by their nature, have a high likelihood of being hazardous waste sites. As of 1984, 35,622 facilities, according to data provided to EPA by the states, received hazardous wastes from small quantity generators, i.e., those facilities that generated 1,000 kilograms of hazardous waste or less a

²Waste piles are not included in our estimate because work is currently ongoing by EPA to obtain more data on waste piles.

Chapter 2
Number of Categories of Potential Hazardous
Waste Sites Has Grown

month. Another 32,941 were establishments (locations that include one or more facilities) that were reported closed as of 1984, and therefore, because of their age, were most likely accepting hazardous wastes before the disposal of hazardous waste was regulated. In addition, 1,856 are facilities that EPA classifies as open dumps because they pose a reasonable probability of adverse effects on health or the environment.

Mining Waste Sites

According to EPA, the extraction and refining of certain nonfuel minerals³—copper, lead, zinc, gold, silver, phosphate, and asbestos—can produce waste constituents with significant levels of highly acidic or alkaline materials, as well as cyanide and other metals.⁴ In 1984, EPA estimated that from 9,700 to about 64,000 sites might be contaminated by mining and mineral processing wastes, a range based on U.S. Bureau of Mines estimates of inactive and abandoned mines as well as active operations that produce these types of nonfuel minerals.

Using 1987 Bureau of Mines data, we estimate there could be 22,339 hazardous waste sites at mines and processing facilities in the United States. Most of this number—20,966—are mines that are closed permanently and may be abandoned; another 169 are permanently closed ore processing plants. The remainder consists of 1,015 mines and 189 processing plants that are currently operating, intermittently producing, or temporarily closed. Although considered active operations, they are currently not regulated as hazardous waste operations and could therefore be causing contamination.

As of January 1987, 38 nonfuel mineral waste sites were either included or proposed for inclusion on the NPL. However, under SARA, EPA may not list any additional mine sites on the NPL before it revises its hazard ranking system, unless EPA takes into consideration the concentration of the hazardous constituents in mine wastes, not simply the volume of wastes produced.

³Coal mine wastes are not included because their cleanup is covered by provisions of the Surface Mining Control and Reclamation Act for reclaiming abandoned coal mine lands.

⁴Wastes From the Extraction and Beneficiation of Metallic Ores, Phosphate Rock, Asbestos, Overburden From Uranium Mining, and Oil Shale, Report to Congress, U.S. Environmental Protection Agency (EPA/530-sw-85-033, Dec. 1985).

Leaking Underground Storage Tanks

Millions of underground tanks in the United States are used to hold a variety of substances, many of them hazardous. Once these tanks begin to corrode and leak, they can pollute groundwater, poison crops, corrode sewer lines and buried cables, and cause fires and explosions. Under subtitle I of RCRA, as amended in 1984, EPA regulates tanks containing petroleum and hazardous substances (as defined under CERCLA), but those containing petroleum are not covered by the Superfund. Each state must maintain separate inventories of petroleum and non-petroleum underground storage tanks.

In its 1984 report to the Congress, EPA estimated that of the 500,000 to 1 million non-petroleum underground storage tanks, 15,000 to 250,000 might be leaking at anywhere from 11,250 to 187,500 sites. Since then, an EPA study found that the number of non-petroleum tanks may actually be much smaller, about 54,100.⁵ Of these, EPA estimated that up to 20 percent, or 10,820, may be leaking.

Pesticide-Contaminated Sites

According to EPA, the problem of pesticides in groundwater is widespread. Although the full extent of contamination is not known, 7 states have discovered pesticides in 6,180 drinking water wells, of which 3,920 had pesticide levels that exceeded state standards.

EPA recognizes that the problem is much larger, however. Altogether 20 different pesticides have been detected in groundwater in 24 states, most probably as a result of agricultural application. In 1984, EPA calculated that there were 86 sites on or proposed for inclusion on the NPL that, to some extent, involved pesticide contamination, although only 6 were related to agricultural use.

Determining the potential number of pesticide-contaminated sites is exceedingly difficult. While some contamination falls into the category of leaks and spills at places where pesticides are handled, these potential "point sources" are not nearly as extensive as the "nonpoint sources" consisting of pesticides applied to croplands, forests, and other large land areas. In total, the nation uses about 383 million acres for cropland, and about 180 million acres are crop-dusted at least once a year.

⁵Compliance Cost Calculations for EPA Regulation of Underground Storage Tanks (EPA Contract 68-01-6621, Dec. 20, 1985).

Even point source contamination could be extensive. EPA has estimated that there are about 40,000 commercial pest control firms in the United States, each of which could be storing and mixing pesticides that may be accidentally leaked and spilled. There are also about 14,000 grain elevators in the nation where fungicides are regularly applied.

Federal Facilities

As owner of one-third of the nation's land area, the federal government could have thousands of hazardous waste sites at research laboratories, maintenance facilities, municipal and state-operated landfills and dumps, and former oil and gas and mining operations, among others. CERCLA, as amended, makes the federal government liable for cleanup of any hazardous waste sites. Federal agencies are also required under RCRA to notify EPA biennially of any sites or facilities where hazardous wastes are or were stored, treated, or disposed of. As of July 1987, there were 32 federal sites listed on the NPL and 16 proposed sites.

Overall, federal agencies have identified about 5,400 potential hazardous waste sites on their lands, although the number will increase as agencies complete their site discovery efforts. The Department of Defense accounts for 3,526 of these potential sites, located on 529 military bases and installations. The Air Force is responsible for the majority of these sites—1,862—followed by the Army with 839 sites and the Navy with 771. All or nearly all of the sites have been assessed, and 99 have already been cleaned up.

In general, civilian agencies have not progressed as far in their site identification and cleanup efforts. In our July 1987 report, we stated that 11 civilian agencies—those that account for nearly all potential hazardous waste sites identified by civilian agencies—had identified 1,882 potential sites. The agencies included the federal government's land management agencies: the five Department of the Interior bureaus and the U.S. Forest Service. The other agencies were the U.S. Coast Guard, the Federal Aviation Administration, and some of the largest nonmilitary research departments and agencies: the Department of Energy, the National Aeronautics and Space Administration, and the Agricultural Research Service. Over 70 percent, or 1,326 sites belong to the Department of Energy and are located at research laboratories and nuclear materials and weapons facilities. The Interior bureaus account for 385 sites located, for the most part, at former mining operations and municipal landfills and dumps. However, as of September 1986, only four of the agencies had completed their inventories. The Energy Department,

for example, was expecting to identify another 400 to 550 potential sites.

Radioactive Releases

Radioactive materials may be a source of contamination at a number of different types of facilities, including landfills and dumps, chemical plants, and nuclear facilities. As of July 1987, 27 sites with radioactive contamination were either listed or proposed for inclusion on the NPL. Three of the 27 are at federal facilities belonging to the Departments of Energy and Defense.

Some radioactive releases are excluded from CERCLA because cleanup response is provided by other legislation, such as certain facilities under the Atomic Energy Act of 1954, or the Uranium Mill Tailings Radiation Control Act of 1978. In addition, as a matter of policy, EPA does not respond to releases at nuclear facilities that are currently licensed by the Nuclear Regulatory Commission but will respond to releases at formerly licensed or state-licensed facilities.

EPA estimates that there may be about 300 radioactively contaminated sites around the country that could potentially require cleanup under CERCLA. This estimate is based on a telephone survey conducted by EPA's Office of Radiation Programs among its regional offices. According to the chief of the office's Environmental Studies and Statistics Branch, the survey did not identify specific types of sites, and the estimate could include any of the types of radioactive releases covered by CERCLA.

Underground Injection Wells

Underground injection came into use as an alternative disposal method for oil field waste in the 1930s; by the 1950s it became a disposal method for other industrial waste as well. Although underground injection wells are regulated under state and federal laws, it is estimated that there may be from 13,794 to 117,323 wells that are presently classified as non-hazardous but at which hazardous wastes were once or are still being disposed of. At least five underground injection wells are listed on the NPL because they threaten drinking water supplies.⁶

EPA regulations under the Safe Drinking Water Act establish five classes of injection wells, each of which must meet certain construction and, in some cases, operating standards. Class I wells inject hazardous and non-hazardous waste below the deepest underground sources of drinking

⁶Most are class IV wells.

water. (A recent GAO report discusses EPA's controls over Class I wells.)⁷ Class II wells are used in conjunction with oil and gas production. Class III wells are used for the extraction of minerals in solution mining operations. All three types include deep wells into which wastes are injected below drinking water levels. In contrast, Class IV and Class V wells are shallow, extending anywhere from about 5 feet to a few hundred feet below the ground surface, into or above drinking water supplies. Class IV wells, which must be closed, contain hazardous wastes. Class V wells contain all other types of wastes.

The 13,839 to 117,368 potential hazardous waste sites fall into the latter two classes of wells. Within this range are the 45 Class IV wells that were reported to EPA by the states in early 1987, all of which, by definition, contain hazardous wastes at relatively shallow depths. The remaining number are Class V wells at which EPA believes the potential for contamination is moderate to high, and the contaminants are likely to include hazardous wastes.

A September 1987 EPA study included approximately 173,000 Class V wells reported by states.⁸ According to an official of EPA's Office of Drinking Water, there is a likelihood that 10 types of Class V wells contain hazardous wastes and are causing drinking water contamination. The number of such wells could range from 13,794 at which there is a high probability of hazardous waste contamination, to 117,323. This higher figure includes 103,529 wells at which the probability of hazardous waste contamination is somewhat lower. Some wells with a high probability of hazardous waste contamination include agricultural drainage wells (1,338), mining and other backfill wells (6,500), industrial drainage wells (3,802), and industrial process water and waste disposal wells (1,989). Some of the other wells with a moderate potential for contamination but with a lower probability of containing hazardous wastes include stormwater drainage wells (80,000 to 100,000), and abandoned drinking water waste disposal wells (3,050).

Town Gas Facilities

Town gas facilities, common in the United States around the turn of the century, represent another new category of potential hazardous waste sites. These facilities, at which gas supplies were manufactured from

⁷Hazardous Waste: Controls Over Injection Well Disposal Operations (GAO/RCED-87-170, Aug. 29, 1987).

⁸Class V Injection Wells, Report to Congress, U.S. Environmental Protection Agency (EPA 570/9-87-006, Sept. 1987).

coal and oil, generated various types of hazardous wastes. At least two town gas disposal sites are listed on the NPL.

According to a 1985 EPA study,⁹ town gas was manufactured at 1,502 sites in the United States between 1890 and 1950. As a result, 11 billion gallons of tar were produced, some portion of which, EPA assumes, was disposed of on or near the sites, either by burial, underground injection, or some other method. EPA therefore assumes that all 1,502 town gas production sites contain significant amounts of hazardous wastes.

Wood Preserving Plants

According to a 1985 study,¹⁰ as many as 975 sites around the country could contain hazardous wastes as a result of wood preserving processes. This estimate assumes that all 608 inactive facilities, along with 80 percent of the 459 active facilities, followed inadequate management practices.

Although EPA restricts the wastewater discharged from wood preserving plants, the toxic chemicals used to treat the wood can nevertheless drip onto soil as the wood is being treated. In addition, rainwater falling around the work area can become contaminated with trace amounts of chromium, arsenic, benzene, and other chemicals used in the preserving process. Facilities may also discharge effluent into unused wells. Forty sites related to the wood preserving industry have already been included or proposed for inclusion on the NPL.

Conclusions

While still not fully understood, the extent of the nation's potential hazardous waste problem appears to be much larger than EPA's CERCLIS inventory indicates. In the last couple of years, EPA has taken a closer look at the potential hazards posed by several types of industries and facilities, and our estimates suggest that as many as 426,000 sites may have to be surveyed, and perhaps further assessed, to determine if federal cleanup under Superfund is necessary. In order for these assessments to be made, sites must be formally identified and entered into EPA's CERCLIS inventory. With an inventory of about 27,000 sites, however, many more sites will have to be formally identified before the extent of the federal and state cleanup effort can be accurately assessed.

⁹Prospective Uses of Field Investigation Team Resources, U.S. Environmental Protection Agency (EPA Contract 6872-028, Dec. 1985).

¹⁰Prospective Uses, EPA, Dec. 1985.

EPA Provides Little Support to State Site Discovery Programs

State programs to identify potential hazardous waste sites vary considerably. Some states rely solely on citizen reports of potential sites, while others actively seek out sites through comprehensive surveys. EPA depends, in part, on these site discovery efforts as the basis for its CERCLIS inventory, and ultimately the NPL, but it has provided the states with little direction or assistance in identifying new sites. Even though EPA is aware that there may be many more sites than are currently included in its inventory, it continues to use its resources almost exclusively for evaluating and cleaning up sites already identified.

RCRA requires that EPA put its own site identification program into place if it finds that a state's program is inadequate. Because it has assigned a low priority to identifying new sites, however, EPA has not evaluated any state site discovery programs, nor has it developed criteria by which to evaluate them. Although the agency has undertaken a review of site discovery methods used by the states, it intends to use the results only to suggest how the states might improve their programs if they wish.

State Site Discovery Programs

As noted in chapter 1, section 3012 of RCRA requires each state to undertake "a continuing program to compile, publish, and submit" to EPA "an inventory describing the location of each site...at which hazardous waste has at any time been stored or disposed of." Each state has such a program, but the methods used to identify potential sites vary considerably.

According to a 1987 EPA-sponsored study of state discovery activities, many states reported that they relied exclusively on "passive" methods in which information is volunteered or channeled to state officials responsible for hazardous waste cleanup.¹ As table 3.1 shows, the study found that citizen reports or complaints about hazardous waste sites are the most widely used of these passive approaches, but a number of states also list as sources other state environmental officials who come across potential hazardous waste sites in the course of their inspections, as well as state officials or contractors who identify new sites during assessments of already identified sites. EPA's study shows that seven states have laws requiring that they be notified of sites where hazardous waste has been disposed of whenever that property is sold or transferred.

¹Site Discovery Methods, EPA Contract 68-01-6888, March 1987.

**Chapter 3
EPA Provides Little Support to State Site
Discovery Programs**

Table 3.1: State Site Discovery Methods

Method	Number of states employing method	Type of method
Citizen complaints	47	passive
Referrals from other agencies	38	active/passive
Survey reviews (records search)	22	active
By-product of preliminary assessment or site investigation work on another site	20	active/ passive
Reports of spills (emergency action)	12	passive
Information solicited from hazardous waste users	11	active
Property transfer regulations	7	passive
Aerial photography	6	active
Reporting by commercial interests	5	passive
Identified during searches for responsible parties	5	active/ passive
Study of selected industry	4	active
Study of selected geographical area	3	active
Other	3	active/ passive

Source: Booz-Allen and Hamilton, Inc.

In a number of states, citizen reports and referrals from either other state agencies or site evaluation teams are the only routine sources of information regarding hazardous waste sites, according to EPA's study. Hawaii, Nevada, and South Carolina rely exclusively on citizen reports, while 12 other states depend on citizen complaints as well as one other source of information.

By contrast, slightly more than half the states reported that they were actively searching for hazardous waste sites through industry or regional surveys, record reviews, analyses of aerial photographs, or other means. All of these states combine these reviews with the passive methods used elsewhere.

**Site Discovery Programs in
States GAO Visited**

Site discovery programs in the five states we visited—California, Connecticut, Louisiana, New York and Texas—were also quite varied, in some cases employing statewide surveys and in others relying mostly on citizen complaints and other passive methods. Each of the states at one time had an active discovery program funded by an EPA grant authorized by section 3012 of RCRA. However, only California, Connecticut, and New York continued these efforts with state funds when federal funding ended in 1984.

California

Although California identifies sites through a variety of methods, including citizen reports, agency referrals, and discoveries during other site evaluations, the major part of its site discovery program has been a statewide survey of abandoned hazardous waste sites. Begun in 1979 by the California Department of Health Services, the abandoned sites project produced a listing of about 25,000 sites in the state's 30 industrial counties where hazardous wastes may have been stored. The listing was compiled from telephone books, business registers, other government agency registers, aerial photographs, and other sources of information. Once the sites were identified, the Department sent questionnaires to present owners to verify that wastes had been disposed of at that site. Department staff also inspected sites to assess the possibility of imminent hazards. As a result of these checks, the state found that about 5,000 of the 25,000 sites might actually contain hazardous waste; these sites are now being evaluated.

In 1986, the project was expanded to include the remaining 28 counties in the state. The Department of Health Services expects to find an additional 5,000 sites through this survey, of which perhaps 50 might be NPL sites, according to a Department official. In this survey, the state is focusing on particular types of industries and sites, such as mines, pulp and paper mills, and pesticide application facilities. California also conducted a study of PCB sites.

When first begun, the project was funded from the Department's operating budget and an EPA grant under the Federal Water Pollution Control Act. In 1983, the state also received a \$558,000 grant under section 3012 of RCRA for identifying and evaluating hazardous waste sites, of which \$65,000 went toward the abandoned sites project. Since 1985, however, the project has been supported entirely by state funds.

Connecticut

Like California, Connecticut also conducted a statewide survey and used reports from citizens and other government agencies to identify hazardous waste sites. Further, the state enacted a real estate transfer law in 1985 that requires sellers of property where certain quantities of hazardous wastes were generated or handled to declare the status of hazardous wastes that may have been released on the property.

Connecticut began its statewide survey in 1979, following a mandate from the state legislature to complete a hazardous waste site inventory by 1981. Only the first phase was completed by that date; it covered 85

of the state's 169 towns. The second phase, covering the remaining 84 towns, was completed in January 1987.

The principal source of information on hazardous waste sites came from the State Department of Environmental Protection's review of manufacturing directories and other records. The state also sent questionnaires to town officials who furnished information on their towns' current and former sites at which hazardous wastes were disposed of. From these sources, the state identified over 3,000 potential sites and found another 2,700 in other ways during its investigation. After visiting the towns and reviewing the data, the state produced an inventory of 567 sites where hazardous wastes had been disposed of.

For the most part, the inventory was funded by the state, to some extent with revenues generated from the state's tax on hazardous waste generators. The state also received a RCRA section 3012 grant in 1983 for \$128,000, which went toward site identification and assessment.

According to a state official, although the worst sites have now been identified, more sites may still be found. As an example, he pointed out that even after the statewide survey was completed, additional sites were identified as a result of the disclosure requirement in the state's real estate property transfer law.

Louisiana

Since the lapse of the state's RCRA section 3012 grant and until recent new efforts, Louisiana did not have active site discovery activities. Its information on hazardous waste sites came from citizens and agencies, and information uncovered during evaluations of sites or searches for parties responsible for cleanup. In 1983, Louisiana had a \$189,000 section 3012 grant from EPA, and used \$20,000 of it for site discovery activities, including a review of existing aerial photographs and hotline calls and a survey of companies handling hazardous waste. However, although questionnaires were sent to each county in the state, many did not respond, and no sites were identified by those that did respond. In August 1987, the Department of Environmental Quality and the Department of Natural Resources undertook another survey, this time of pipeline pumping stations, to determine whether any contaminants, including PCBs, were present.

The manager of Louisiana's Inactive and Abandoned Sites Program believes that additional sites, including potential NPL sites, would be discovered in the state if an active site discovery effort were funded. He

believes, for example, that a review of the state's chemical manufacturers' guide would reveal additional abandoned sites, particularly at former creosote and oil refinery plants. He also believes sites would be found by reviewing herbicide and pesticide application sites, but he states that without funds for the review, the sites will for the most part go undiscovered.

New York

With a mandate from its state legislature, New York has undertaken an active effort to identify sites, in addition to the usual passive methods. Spurred by the disaster at Love Canal, the state legislature in 1979 enacted a law, which (with amendments) required the state to compile a registry of hazardous waste sites and annually report the results to the legislature. To compile the registry, the Department of Environmental Conservation solicited information from the health and planning departments of New York's 62 counties. It also set up telephone hotlines for citizen referrals and analyzed aerial photographs. Close to 900 sites had been identified from these sources by the end of 1983.

In 1984, concerned that there were still undiscovered sites, the department sent questionnaires to 14,000 handlers of hazardous waste who operated between 1952 and 1982. About 60 percent responded. From these responses, 449 sites are to be further evaluated, and the state expects that about 50 of these will eventually be listed on the registry. However, a state official estimated that in the long run about 200 sites altogether may be identified by one means or another.

Since 1982, New York's site identification program has been funded by revenues generated from the state tax on hazardous waste generators. New York also received a section 3012 grant in 1983, but all of those funds were used for evaluating known sites.

Texas

Although Texas has actively searched for certain types of hazardous waste sites, its current program is based largely on citizen complaints and other passive methods. In 1984, the state received a \$28,000 amendment to its section 3012 grant in order to survey 35 wood preserving plants, 30 town gas facilities, and 1,300 pesticide aerial spray application facilities in Texas. As a result of these surveys, two wood preserving plants are now on the NPL.

In 1985, the Texas legislature enacted a state Superfund law that provides funds for cleanup when necessary to abate health hazards. As

part of this law, the state is required to identify sites posing an imminent hazard to public health and safety or the environment. The Texas Water Commission, the agency in charge of the Superfund program, has produced an inventory based on citizen complaints and records in its files but has not initiated any searches for new sites.

EPA Has Given Little Assistance to State Site Discovery Efforts

As indicated in these discussions of state activities, EPA has provided some funding for site discovery efforts in the past; it has also furnished the states with the results of its own special studies. Both forms of assistance have been limited, however, and EPA has not provided funding for site discovery since 1983, despite continued congressional authorization.

In our 1985 report, we recommended that, given the large number of potential hazardous waste sites, EPA should develop a plan for identifying them. In responding to our report, EPA contended it had such a plan, one that relied on a combination of federal and state activities. EPA activities were to include maintaining the CERCLIS inventory, conducting special studies, and evaluating known sites. The states' role, among other things, was to identify new sites.

EPA has given the states little assistance or guidance in this role, however. For fiscal year 1983, the Congress appropriated \$10 million for grants to the states authorized under section 3012 of RCRA. The funds were to be for completing the site survey and inspection process, which the Congress then believed was nearly at an end. The grant funds EPA awarded to the states were used for surveys, aerial photographs, and other active search methods.

Recognizing that states still needed assistance in identifying sites, the Congress, in the 1984 amendments to RCRA, again authorized \$25 million a year over 4 years to help states develop hazardous waste inventories. However, EPA did not request any funds under this authorization. Since the 1986 Superfund reauthorization, funds have also been available under SARA and fiscal year 1987 appropriations for inventory and assessment efforts carried out by the states under cooperative agreements with EPA. Once again, however, because EPA would rather use limited resources for evaluating and cleaning up sites already identified, EPA does not plan to use any funds for site discovery purposes but only for assessment, evaluation, and cleanup of known sites.

Although little assistance has been given to states, EPA regions have sponsored nine special studies aimed at identifying additional sites. According to EPA officials from the Discovery and Investigations Branch, each was undertaken by a regional office on its own initiative rather than as part of a comprehensive nationwide program. The Boston, Philadelphia, and Dallas offices, for example, each sponsored efforts that used aerial photographs and other information. These efforts resulted in the identification of more than 1,000 potential sites. EPA headquarters also sponsored studies of the wood preserving industry and town gas facilities (referred to in ch. 2) that were used by Texas and other states as a basis for further investigation.

When we reported on EPA's program in 1985, the agency had assigned low priority to identifying new sites. It continues to do so. At that time, EPA believed the vast majority of potential hazardous waste sites had been identified, and it consequently chose to emphasize the assessment of known sites in order to determine cleanup priorities. According to EPA Superfund officials, this emphasis remains.

Although these officials now recognize that many more hazardous waste sites may exist, they believe a higher priority is to meet the deadlines imposed by SARA for assessing and evaluating those sites already included in the CERCLIS inventory. As noted in chapter 1 of this report, section 116 of SARA recommends that EPA attempt to complete assessments of all sites on CERCLIS (as of October 1986) by January 1988 and requires EPA to complete evaluations of those sites requiring cleanup by October 1990, or 4 years after listing on CERCLIS. In order to meet these deadlines, EPA officials believe it is necessary to limit the agency's grants to states to include no provisions for site discovery. As a result, the extent to which new sites are identified is a function of the states' willingness to fund discovery activities.

EPA Is Not Exercising Oversight of State Programs

To make sure that states are adequately performing their responsibilities for identifying and reporting potential hazardous waste sites, RCRA authorizes EPA to review state programs. While this review is discretionary, EPA is to put its own program into place if it finds that a state's program is inadequate. While this review is discretionary, EPA is to put its own program into place if it finds that a state's program is inadequate. Specifically, section 3012 of RCRA states:

"[i]f the [EPA] Administrator determines that any state [site inventory] program ... is not adequately providing information respecting the sites in such State ..., the

Administrator shall notify the State. If within ninety days following such notification, the State program has not been revised or amended in such manner as will adequately provide such information, the Administrator shall carry out the inventory program in such State."

Because of the low priority given to site discovery, however, EPA has not reviewed any state program to determine whether it is adequate and would meet the requirements of the above section, nor has it developed any criteria or standards for evaluating state programs, according to a Discovery and Investigations Branch official. In late 1986, in response to congressional interest and our earlier report, EPA sponsored a nationwide study of methods used by the states for discovering potential hazardous waste sites. However, as discussed earlier, this study examined the methods used by the states and rated them in terms of cost, effectiveness, and ease of administration. The study's objectives were to understand the status of nationwide site discovery activities, and to prepare options and determine requirements for a proactive nationwide site discovery program. EPA does not intend to use the information to evaluate any state programs, nor will it require any states to change the programs they currently have in place.

Superfund program officials told us that since they are not concerned with identifying additional sites, they have no reason to evaluate the adequacy of state site discovery programs. The Discovery and Investigations branch chief also said that since EPA is no longer awarding grants to the states for site discovery, it would be unrealistic for the agency to evaluate the states' programs. Once again, Superfund program officials emphasized that EPA's priority is evaluating and cleaning up known sites rather than seeking out new ones.

Conclusions

Although it is clear that there may be considerably more hazardous waste sites than listed in its inventory, EPA continues to devote its resources and attention almost exclusively to assessing and cleaning up already known sites. Identifying the remaining sites has been left to the states with little oversight or assistance from EPA, despite the Congress' expressed interest in providing such aid. Not unexpectedly, therefore, hazardous waste site identification has become a varied collection of state programs, each reflecting its own state's priorities, which may not reflect the goals of RCRA.

As we stated in our 1985 report, we recognize the importance of evaluating and cleaning up known sites, but we also believe that the Congress

Chapter 3
EPA Provides Little Support to State Site
Discovery Programs

and the public need to be aware of the full extent of the nation's hazardous waste problem in order to make informed decisions about the Superfund program. Although the Congress assigned the states responsibility for identifying hazardous waste sites and reporting them to EPA, it also gave EPA the responsibility for taking over state programs if it found that the states were doing an inadequate job. The survey of state programs EPA recently sponsored may provide some useful information for evaluating state programs, but EPA still needs to develop criteria to assess whether a state's efforts are adequate. These evaluations can also provide EPA with a basis for determining whether states need financial assistance in order to run their programs.

Recommendations

We recommend that the Administrator, EPA, develop guidelines and criteria for assessing state hazardous waste site programs under section 3012 of RCRA and evaluate the state programs according to these criteria. As part of these evaluations, EPA should examine the states' need for federal funding or other forms of assistance.

EPA's Hazardous Waste Site Inventory Continues to Be Incomplete

EPA's inventory of potential hazardous waste sites still does not contain all of the sites identified by the states, for the most part because EPA's regional offices are not adding them; to some extent, states are also not reporting all known sites. Despite our previous recommendations with which EPA agreed, EPA has done little to change the practices of its regions or to encourage complete reporting by the states.

Of the 837 sites (in 5 states) that our 1985 report said were known but not included in the CERCLIS inventory, nearly 500 are still missing, including 3 of the 7 that state officials then thought might be serious enough to qualify for the NPL. Most of the sites still missing that we were able to identify individually have been reported to EPA by two states, but are not included in CERCLIS because their corresponding EPA regions were accepting only the number of sites for which they had resources available for assessments. Many sites discovered by these two states since 1985 are also not included in CERCLIS for this reason.

Status of Sites Previously Not in CERCLIS

In 1985, the Director of EPA's Superfund Office told us that EPA needs to have a complete inventory of potential sites in order to determine which sites require federal cleanup. Even if states are pursuing cleanup action, all sites should be evaluated so that either they can be placed on the NPL, if appropriate, or EPA can take emergency actions, such as installing fencing or removing drums if necessary. The current head of EPA's Site Evaluation Division agrees that the inventory should include all sites that are reported by states.

Nevertheless, since our 1985 report, EPA has not taken steps to see that all identified sites are reported and entered into the CERCLIS inventory. We found in 1985 that 837 potential hazardous waste sites identified by the states of California, Connecticut, Louisiana, New York, and Texas, including 7 thought potentially serious enough to qualify for the NPL, had not been included in CERCLIS as of the beginning of 1985. By March 1987, 494 of these sites, including 3 of the potential NPL candidates, still did not appear on the inventory.

As table 4.1 shows, most of the 13 sites in Louisiana and Texas that had been missing in the beginning of 1985 are now in the inventory. But less than half of the 504 sites in California, and only a third of New York's 191 sites not in CERCLIS earlier have since been added. About 80 percent of the 129 sites in Connecticut are still missing, including 1 that is still believed to be a potential NPL site.

Chapter 4
EPA's Hazardous Waste Site Inventory
Continues to Be Incomplete

Table 4.1: Status of Sites in Five States Previously Not Included in March 1985 CERCLIS Inventory

States	Sites not on CERCLIS (3/85)	Sites on CERCLIS (3/87)	Sites with preliminary assessments	CERCLIS sites with site inspections	Sites still not on CERCLIS (3/87)
California	504	242	188	15	262
Connecticut	129 ^a	26	14	1	103 ^a
Louisiana	7	6	3	3	1
New York	191	65	NA ^c	NA ^c	126
Texas	6 ^b	4	4	3	2
Total	837	343	209	22	494

^aIncludes one site that the state believed could qualify for the NPL.

^bAll 6 sites were believed by the state to be potential NPL sites.

^cWe were unable to identify the 65 sites by name and were therefore not able to determine whether assessments and site inspections had been performed.

Most of the sites that were added to CERCLIS have had preliminary assessments and some have also had site inspections (table 4.1). We could not identify individually the 65 New York sites on CERCLIS and therefore were not able to determine the status of their assessments. But among the sites in the other 4 states, 209 had been assessed, and 22 had been inspected.

Status of Potential NPL Sites

Our 1985 report found that seven of the sites discovered by the states but not added to CERCLIS could be serious enough to qualify for the NPL, according to state officials. Six of these sites were in Texas, and one was in Connecticut. Since then, Connecticut has still not reported its potential NPL site to EPA. Texas has reported four of its six sites, which EPA has added to CERCLIS; the other two, the state decided, would not meet NPL criteria. The four sites are all at hazardous waste facilities permitted under RCRA subtitle C. In each case, Texas has used its delegated RCRA authority to compel corrective action. However, when one of the facilities went bankrupt, and could no longer pay for cleanup, the site was placed on the NPL.

EPA Does Not Have a CERCLIS Policy

Although EPA officials have stated that CERCLIS should contain all the sites identified by the states, the agency does not have a formal CERCLIS reporting policy. Because the regions and the states have not been instructed on when or what types of sites should be added to CERCLIS, they have adopted their own policies and practices, some of which limit or discourage full reporting.

Reporting of Sites by the Five States

As we found in 1985, most of the sites that are missing were reported to EPA's regional offices but not listed by them. In the remaining cases, the states chose not to report sites, for a variety of reasons, as table 4.2 shows, close to 193, or 83 percent, of the 232 sites we were able to identify individually were still missing from CERCLIS in 1987 because they were not added by EPA's regional offices. (Because we could not identify the sites in California individually, we were unable to determine why some did not appear in the inventory.) Much the same situation existed in 1985. That is, of the 837 sites not in CERCLIS then, 680, or 81 percent, had been reported to EPA but not included.

Table 4.2: Sites Not Included in CERCLIS Inventory, Reported and Unreported

State	No. of missing sites		No. of sites not reported (% of total missing)		No. of sites reported but not included (% of total missing)	
	1985	1987	1985	1987	1985	1987
California	504	262	104(21%)	(NA) ^a	400(79%)	(NA) ^a
Connecticut	129	103	40(31%)	36(35%)	89(69%)	67(65%)
Louisiana	7	1	7(100%)	1(100%)	•	•
New York	191	126	•	•	191(100%)	126(100%)
Texas	6	2	6(100%)	2(100%)	•	•
Total	837	494	157(19%)	39(17%)^b	680(81%)	193(83%)

^aWe could not identify the sites individually.

^bPercentage shown is of the 232 sites we could identify; it excludes California sites.

According to officials of EPA's Site Discovery and Evaluation Division, the agency does not have formal criteria for listing sites on CERCLIS, leaving it to the judgment of each EPA region as to whether a site should be added. EPA headquarters has not provided guidance to the states either. As described below, the five states and four regions we visited have adopted their own practices or policies on reporting, with varying results.

California

Although we could not identify each of the 262 sites in California that are still missing from CERCLIS, we found that the reasons for their absence are the same as in 1985. At that time, although the state's abandoned site list contained 504 entries, EPA's region IX office wanted California officials to identify only the 400 most highly suspect sites, the number for which preliminary assessment funds were available, for inclusion in CERCLIS so that they could receive preliminary assessments. Even these 400 were not placed on CERCLIS, however, apparently because of an oversight, an EPA regional official said.

Region IX has still not added all of these 400 sites to CERCLIS, however, and has continued its practice of asking California to report only those sites that the region will be able to fund for assessment and site inspection. As noted in chapter 3, the state Department of Health Services has now identified about 5,000 sites needing further evaluation, with perhaps an equal number to come. Out of these sites, however, the region is including only a small portion in CERCLIS. For fiscal year 1987, for example, officials have asked the state to identify only about 350 sites, the number for which EPA will provide assessment and evaluation funds. EPA officials told us that because of the deadlines for these activities—4 years for evaluating CERCLIS sites—they will only add to CERCLIS the number of sites for which assessment funds are available.

Connecticut

In Connecticut, both state and regional office practices account for the sites that are missing from the CERCLIS inventory. In 1985, we found that 129 known sites in Connecticut were not included in the CERCLIS inventory. Of this number, 89 were sites that Connecticut had reported to EPA region I but that the region did not enter into CERCLIS. At the time of our review, regional officials explained that the sites had been entered into an earlier data base and had not survived the conversion to EPA's new system. EPA officials told us they did not consider this reconciliation important enough to divert time and attention away from other activities.

This view persists. Of the 89 previously reported sites, 22 are now in CERCLIS because the state requested funds for their assessment. Region I has not sought out the 67 sites remaining to be assessed, still considering this a low priority. As in region IX, region I officials believe that SARA deadlines serve to limit the number of sites they can add to CERCLIS to those for which assessment funds are available. Although Connecticut has identified an additional 243 sites since March 1985, the region will add only 60 sites to CERCLIS this year and the rest in later years, as funds for their assessment become available.

Connecticut has also chosen not to report 36 sites, or most of the 40 it had not reported in 1985. Almost all of these 36 are sites at which the state's Water Enforcement Unit has been taking enforcement action and attempting to get responsible parties to clean up. According to an assistant director of Connecticut's hazardous waste program, it remains the state's policy to report sites already regulated by the state only when the state's enforcement efforts fail and it cannot compel cleanup.

For this reason, the state did not report to EPA the municipal landfill it told us in 1985 could be an NPL site. The assistant director told us there are many more landfills the state is not reporting that could qualify for the NPL. For one thing, he said, the criteria and ranking system EPA uses to determine what should be on the NPL overstates the degree of hazard present. He also believes that federal cleanup measures are often unnecessarily time-consuming and expensive. The state has installed groundwater monitoring systems and has taken other corrective actions to control contamination at these sites, he said.

Louisiana

Since 1985, the state has reported six of the seven sites that had been missing from CERCLIS, but its reporting policies generally have not changed. As in the past, Louisiana continues to report sites only after it has verified through file searches and inspections that hazardous wastes are present. The state will not report sites if they are regulated under other authorities, such as RCRA, but it will now report sites even if they would not qualify for the NPL. The state will also report a site if it fails to get responsible parties to pay for cleanup, or if EPA is providing funds for site assessment and evaluation.

Since our report, EPA's region VI has sought out the names of the sites that had not been reported in order to place them in CERCLIS. According to the region's Superfund section chief, the region has encouraged all the states in its area, including Louisiana and Texas, to report all of the sites they discover so EPA can determine if further evaluation or cleanup is necessary.

New York

As discussed in chapter 3, New York must compile a registry of hazardous waste sites throughout the state. During our 1985 review, staff from the state Department of Environmental Conservation and EPA region II were attempting to reconcile New York's registry with the CERCLIS inventory; they found that the state registry contained 191 sites that were not in CERCLIS. A staff member of the Department told us that once the state and EPA had finished reviewing the information on each site, it would be incorporated into CERCLIS.

As of March 1987, however, the reconciliation was not complete, and 126 of the missing sites were still not in CERCLIS. New York had also added another 70 sites that were not in CERCLIS. Although region II officials were not able to explain this discrepancy, they said that adding

new sites to CERCLIS was a low priority and that their resources, including staff, have instead been concentrated on evaluating and cleaning up the sites already in CERCLIS.

Texas

Although four of the six sites in Texas that were missing from CERCLIS in 1985 have since been added, Texas' reporting policy has not changed. Other sites have been discovered since 1985, but the state still does not report those for which it can seek cleanup under RCRA or those that it expects it will have to clean up without federal funds, that is, non-NPL sites.

The four sites Texas reported to EPA are RCRA subtitle C facilities that the state believed would become NPL sites if the owners were to go bankrupt; one owner did go out of business, in fact, and the site has been placed on the NPL. The two sites Texas did not report are also subtitle C facilities, but at these sites the state decided, after investigating further, that the contamination was not severe enough to qualify them for the NPL.

Reporting of Sites by Other States

Although we did not obtain information directly from the remaining states, the 1987 EPA-sponsored study of states' discovery activities showed that states are not routinely reporting all sites for a variety of reasons. Half the states prescreen sites before they are entered into CERCLIS. For example, the report stated that

- a Massachusetts official expressed a preference for managing the state's highest priority hazardous waste sites without entering them into CERCLIS;
- only a small number of sites that Illinois has identified have been entered into CERCLIS;
- Wisconsin ranked its 2,700 known sites, and identified 300 for inclusion in CERCLIS; and
- Kansas' list of sites contains three times as many sites as are in CERCLIS, although not all would be eligible for funding under CERCLIS.

EPA Has Not Been Responsive to GAO Recommendations

As a result of our earlier review, we recommended that EPA encourage the states to report the existence of hazardous sites and that it emphasize to its regions the need to incorporate into CERCLIS the sites reported by the states. In a July 1985 letter to the chairman of the House Committee on Government Operations, EPA said it agreed with our recommendations. According to the agency, its regional offices would become more assertive in obtaining information from the states. Regional offices would also obtain inventory data from states under new cooperative agreements then being negotiated with the states.

We found, however, that EPA headquarters has not issued to the regions or the states any written instructions or guidance on reporting sites. Region VI was the only region of those we reviewed to respond to our report by adding to CERCLIS most of the sites in Louisiana and Texas we had found to be missing, but this action was undertaken on the region's own initiative. While EPA headquarters officials still believe in the importance of full reporting, they nevertheless view it as a low priority and have therefore given it little attention.

Conclusions

Although EPA continues to believe that states should be reporting all identified sites for inclusion in CERCLIS, it has not given either the states or the regions any indication that it has such a policy, or any instruction on how to carry it out. Indeed, the EPA regions were responsible for most of the omissions we found for the sites we followed upon, once again reflecting the low priority generally given to site identification. Rather than keeping the CERCLIS inventory complete, two of the four EPA regions we visited have adopted the practice of adding only the number of sites for which they have assessment funds. In our view, this is not an appropriate approach. Recognizing that resources for site assessment are necessarily limited, we nevertheless believe EPA should first determine its work load and then submit to the Congress a request for the funds necessary to carry it out. However, these EPA regions have done precisely the reverse, defining their work loads not by the number of sites that have to be assessed, but by the amount of funds they have available for assessment. However, SARA gives EPA a chance to explain why time frames for evaluation may have been missed, thereby allowing for all known sites to be put on CERCLIS without making the evaluation goals a constraint to listing sites.

As a result of EPA's and states' policies, CERCLIS is not an accurate picture of the hazardous waste problem. Instead, CERCLIS is becoming more a reflection of the amount of money EPA has allocated to site assessment

and the sites the states are choosing to report. With only a partial inventory, the Congress is not fully informed about the amount of work facing EPA and the states, and the level of resources that should be allocated to the Superfund program. The Congress may decide to increase funds for assessment or to keep funding at the current level, but its decision should be made in full awareness of the amount of work that needs to be done.

As was evident in the case of region VI, the EPA regions can encourage states to do a better job of reporting known sites. However, region VI was the only region in our review that chose to do so. Some regions, as we have noted, are instead discouraging states from reporting all their sites, and some states are, under certain circumstances, delaying reporting sites to EPA. Thus, there remains a need for EPA headquarters to set a clear, agencywide policy for all regions, with specific instructions on the types of sites to be added to CERCLIS and when—that is, the conditions under which—sites are to be listed.

As stated in chapter 3, we do not disagree with EPA that high priority should be given to the timely assessment and cleanup of existing Superfund sites. However, we believe EPA needs to strike a better balance between assessing and cleaning up existing sites and assuring that reasonable efforts are being made to uncover, inventory, and assess potential new sites. The importance of such an approach is underscored by the large estimated universe of additional potential sites discussed in chapter 2.

Recommendations

To ensure that the public, the Congress, and EPA have a more accurate view of the nation's hazardous waste problem, we recommend that the Administrator, EPA, issue a formal CERCLIS reporting policy to be followed by the regions and the states. Specifically, we recommend that the Administrator

- develop a statement of EPA's position on the need for full reporting of sites identified by states as potential hazardous waste sites;
- issue instructions to EPA regions on the types of sites that should be added to CERCLIS and when they should be added, and periodically assess how well each EPA region is following these instructions; and
- advise each state of these reporting criteria and the importance of complying with them, and direct each region to work with the states to implement these criteria.

Major Contributors to This Report

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

Hugh J. Wessinger, Senior Associate Director, (202) 275-5489
Lawrence J. Dyckman, Group Director
Peggy L. Anthony, Evaluator
Tajuana Leach, Secretary

**Washington Regional
Office**

Walter E. Reed, Jr., Evaluator

Boston Regional Office

Ellen M. Crocker, Regional Assignment Manager
Carol L. Patey, Evaluator-in-Charge
James W. Hansbury, Evaluator
Jennifer W. Arns, Evaluator
Harriet C. Ganson, Analyst

Consultant

Bernice Steinhardt