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HAZARDOUS WASTE SITES

State Cleanup Practices





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

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

B-281473

December 24, 1998

The Honorable John R. Kasich
Chairman
Committee on the Budget
House of Representatives

Dear Mr. Chairman:

As of October 1998, about 1,200 of the nation's most severely contaminated hazardous waste sites were being cleaned up under the Environmental Protection Agency's (EPA) Superfund program. States are addressing thousands of additional hazardous waste sites in their own cleanup programs. Some of the state programs, which were originally modeled after the Superfund program, have been adjusted over the years to encourage more cleanups by site owners and others and to achieve cleanups more efficiently.

This report responds to your request that we (1) identify practices that are both used in selected state programs at sites that may be contaminated enough to qualify for long-term cleanup under the Superfund program and that are believed by state officials to reduce the time and expense of cleanups, and (2) obtain the views of EPA, environmentalists, and other stakeholders about whether the states' practices may be applicable to the Superfund program.

Results in Brief

Hazardous waste program officials at each of the seven states we contacted—Illinois, Massachusetts, Michigan, Minnesota, New Jersey, Pennsylvania, and Texas¹—identified cleanup practices that they believe lead to faster or less costly cleanup of sites and that have been applied at sites that are sufficiently contaminated to qualify for the Superfund program. The practices were generally used in several of the states, but two were used in only a single state.² State officials said that the practices facilitated cleanups in one of three ways. First, some practices promoted faster decision making about how to clean up sites, that is, decisions about which cleanup “remedies” to use. In six states, for example, a state or a

¹We selected these states' hazardous waste remediation programs because they are among the largest state programs in the nation and were cited by environmental policy stakeholders, such as environmental and industry groups and EPA, as likely to have implemented practices that are different from EPA's. Profiles of the state programs we selected are presented in app. I. App. III lists the stakeholders that we contacted.

²App. II lists the states in which each practice was used.

party responsible for site cleanup can choose cleanup remedies on the basis of preestablished standards for maximum contaminant levels in soil or water, without the lengthy studies of the site's health and environmental threats that EPA nearly always requires before remedy selection at Superfund sites.

Second, officials of all seven states said that their programs allow less costly cleanup remedies than the Superfund law requires, which are nevertheless, they believe, protective of health and the environment. For example, some of these states are more willing to accept remedies that "contain" contaminants on site instead of removing or destroying them in permanent remedies, so long as they prevent human or environmental exposure.

Lastly, officials of two states said their state programs reduce litigation costs, speed up cleanups, and improve the fairness of the cleanup process by not holding some parties responsible for cleanup who would be liable under the Superfund law. Although the officials provided some anecdotal evidence illustrating the benefits of these practices, none could provide a formal assessment of time and cost savings.

The environmental policy stakeholders that we interviewed, including EPA, state and national environmental organizations, and representatives of local governments, generally did not dispute that the state practices identified can facilitate faster or less costly cleanups. Because they can reduce costs, the state practices are generally advantageous to private companies and others responsible for cleaning up sites. However, EPA and environmental and local government groups said that applying some of the practices to the Superfund program could have disadvantages. For example, while using state-established standards to specify the end goals of a cleanup without a site-specific risk assessment can save money, an EPA regional official said that the use of such standards may not be suitable at very complex sites, with numerous contaminants and possible avenues of human exposure.

Environmental groups as well as representatives of state and local officials noted that containment remedies leaving contamination at sites would require controls over the use of the sites, such as restrictive zoning, to reduce human exposure to the contaminants. These groups were concerned that these controls might be changed over time or might not be enforced in the long term. Some stakeholders, such as a Michigan environmental group, opposed any changes that would lessen the liability

of parties at Superfund sites, because the loss of their contributions to site cleanup would increase government costs or result in fewer cleanups.

Finally, a number of stakeholders, including state officials, said that a lessening of the Superfund program's more rigorous cleanup requirements or liability standards could negatively affect the state programs. They noted that states can refer sites at which parties responsible for cleanup refuse to comply with state requirements to EPA for possible action under the Superfund program. The belief of responsible parties that the Superfund requirements are more onerous than the states' is a powerful incentive for cooperation with state authorities that might be weakened if the Superfund program became more like the state programs.

Background

After a possible hazardous waste site is reported to EPA, it is evaluated to determine whether it should be placed on the National Priorities List (NPL), EPA's list of sites that present serious threats to human health and the environment. The cleanup at an NPL site consists of several phases. First, through the remedial investigation and feasibility study, the conditions at a site are studied, problems are identified, and alternative methods to clean up the site are evaluated. Then, a final remedy is selected, and the decision is documented in a record of decision. Next, during an engineering phase, called the remedial design, technical drawings and specifications are developed for the selected remedy. Finally, in the remedial action phase, a cleanup contractor begins constructing the remedy according to the remedial design. Under the Comprehensive Environmental Response, Compensation, and Liability Act, (CERCLA), which established the Superfund program, EPA must give preference to those long-term cleanup actions that permanently and significantly reduce the volume, toxicity, or mobility of hazardous substances at a site.³ Under CERCLA, parties responsible for cleaning up sites can include site owners and operators, as well as generators and transporters of hazardous waste.

As of August 1998, 1,193 sites were listed on the NPL, and another 56 were proposed for listing. Remedies had been constructed at 526 sites. Since the Superfund program began, 175 sites have been deleted from the NPL. In addition, the program has conducted about 5,000 removal actions—short-term response actions to address emergency and other situations—at NPL and other sites.

³This report will refer to this concept as the "preference for permanent remedies."

Our reviews have shown that the Superfund cleanup process can be long and expensive. In March 1997,⁴ we reported that the cleanup of nonfederal sites completing the cleanup process in 1996 had taken an average of 10.6 years after placement on the NPL and that remedy selection at sites completing that phase of the cleanup process in 1996 had taken an average of 8.1 years after a site's listing. In September 1997,⁵ we reported on a growing number of expensive Superfund cleanups. We said that in 1996 EPA had spent \$10 million or more in that year alone on nine sites, up from two sites with the same level of annual spending in 1989. Spending on the nine sites, which represented less than 3 percent of the sites where EPA spent money for remedial actions, totaled about \$238 million, almost 57 percent of remedial action spending at all sites.

Beginning in 1993, EPA launched a series of administrative reforms to address a wide range of Superfund concerns. These reforms have attempted to speed up site investigations, choose more cost-effective remedies, reduce litigation, and make other improvements. According to EPA officials, the reforms have begun to work. EPA officials believe that cleanup durations have recently been reduced to an average of 8 years.⁶ In addition, the National Remedy Review Board EPA created to review proposed site cleanup remedies, had saved \$37 million as of November 1997 through its examination of 20 remedies. EPA has also encouraged its regions to revisit remedy decisions when new information or technical advances indicate that the intended level of health or environmental protectiveness might be achieved at less cost. According to EPA, these remedy updates had saved at least \$725 million at over 120 sites as of November 1997. EPA also made it easier for parties with only minimal responsibility for site contamination to settle their liability with lower legal expenses.

All 50 states have established their own clean up programs for hazardous waste sites, according to a 1998 survey by the Environmental Law Institute.⁷ Some of these state programs can handle highly contaminated sites, whose risks could qualify them for the Superfund program, as well as less dangerous sites. Some states initially patterned their cleanup

⁴Superfund: Times to Complete the Assessment and Cleanup of Hazardous Waste Sites (GAO/RCED-97-20, Mar. 31, 1997).

⁵Superfund: Trends in Spending for Site Cleanups (GAO/RCED-97-211, Sept. 4, 1997).

⁶Our report entitled Superfund: Duration of the Cleanup Process at Hazardous Waste Sites on the National Priorities List (GAO/RCED-97-238R, Sept. 24, 1997) presents our assessment of the projected 8-year completion time for sites that began the cleanup process in fiscal years 1986 through 1994.

⁷An Analysis of State Superfund Programs: 50-State Study, 1998 Update, Environmental Law Institute.

programs after the Superfund program, but over the years, in an effort to clean up more sites faster and less expensively, have developed their own approaches to cleaning up sites. States accomplish cleanups under three programs: (1) voluntary cleanup programs that allow parties to clean up their sites without enforcement action, often to increase the site's economic value; (2) brownfields programs that encourage the voluntary cleanup of sites in urban industrial areas to reuse the sites and avoid the expansion of industry into "greenfields," that is, undeveloped land; and (3) enforcement programs that oversee the cleanup of the most serious sites and force uncooperative responsible parties to clean up their sites.⁸ States generally use their voluntary and brownfields programs to clean up less complex sites by offering various incentives to responsible parties, such as reduced state oversight. Some states maintain cleanup funds to pay all or a portion of the costs of cleanups at sites for which responsible parties able to pay for full cleanups cannot be found.

State Practices That Officials Believe May Facilitate Faster, Less Costly Hazardous Waste Cleanups

Hazardous waste officials in each of the seven states we contacted identified practices used at sites sufficiently contaminated to be included in the Superfund program that they believe achieve faster and less costly cleanups than would occur under the Superfund program. Some of these practices are designed to facilitate faster remedy selection, thereby saving time or money before site cleanup begins. Other practices allow the implementation of less expensive cleanup remedies that officials believe are nonetheless protective of human health and the environment. Two states have adopted practices that reduce the liability of parties who might be responsible for cleanup costs under Superfund's liability rules. State officials said that these practices have been applied to some state program sites that are sufficiently contaminated to qualify for the NPL. Although the officials described instances in which these practices have yielded benefits, none could formally document the time and cost savings of the practices.

States Contend Approaches to Site Assessment and Remedy Selection Can Save Time

State officials from all seven states described practices that they believe facilitate faster remedy selection at contaminated sites, including sites contaminated enough to qualify for Superfund cleanups. These officials said that the use of preestablished cleanup standards or of presumptive remedies, that is, remedies proven to be effective for certain cleanup problems, without extensive consideration of alternate remedies, can

⁸EPA has provided seed money for the development of voluntary state cleanup programs and provided support for the development of brownfields programs.

expedite remedy selection. Officials of five states said that more flexible public involvement requirements can save time when cleanups are not controversial.

Fixed Standards for Soil and Groundwater

Officials representing six state programs said that selecting cleanup remedies for sites on the basis of preestablished standards that specify the maximum concentrations of contaminants in soil and water after cleanup, without conducting time-consuming, site-specific risk assessments, speeds up the remedy-selection process. Illinois, for example, allows the use of “look-up tables” that specify maximum concentration levels for about 150 specific soil and groundwater contaminants.⁹ These look-up tables, according to the state officials, quickly and clearly defined the end goal of the site cleanup without a risk assessment, allowing the state and the responsible parties to determine how best to achieve this standard.

According to the state officials, the use of the statewide standards offers a time savings when compared to the approach that the sites in EPA’s Superfund program follow. EPA has developed a few soil cleanup standards and may in certain circumstances apply standards from its water programs and state standards at Superfund sites; however, the Superfund regulations require that each site receive a baseline risk assessment showing the need for action. These risk assessments characterize the current and potential threats to human health and the environment posed by contaminants at the site. Officials in both Illinois and Pennsylvania said that eliminating risk assessments can save considerable time. According to an Illinois official, while the duration of risk assessments varies by site, a risk assessment can add as much as 2 years to the remedy-selection process, while a Pennsylvania official said that many months can be saved.

More Limited Public Involvement Efforts

Officials in five states said that, in comparison to EPA, they have less rigorous requirements for extensive public involvement in remedy selection. According to New Jersey program officials, state law requires that program officials notify local officials—such as the mayor’s office or the municipal health department—about an impending site cleanup. The state then generally defers the decision about public meetings or other more extensive forms of public outreach to local officials. State officials explained that more extensive public involvement measures are not

⁹In the states that we contacted, this reliance on preestablished standards was typically one of several approaches the state and responsible parties could take to develop a site remedy. For example, under Pennsylvania law, the standards are one of three overall approaches to site cleanup. Other options included cleaning up the site to background standards, i.e., restoring the site to conditions that existed before the contamination occurred, and site-specific standards, which require detailed risk assessment.

required—although the state may pursue them if it sees the need—because public meetings are often sparsely attended, and the results of such efforts do not justify the time and resources required.

New Jersey's approach contrasts with EPA's more extensive public involvement requirements. The Superfund program's regulations require that at each NPL site, EPA develop a community relations plan describing a community's information needs and outlining ways that the agency will meet these needs. Furthermore, EPA must notify groups affected by the site of the availability of technical assistance grants that can be used to hire experts to explain technical information about the site. EPA must also allow adequate opportunity for public comment, such as at a public meeting. A transcript of the public meeting must be made available to the public as well. The final cleanup plan must include a response to each significant comment and question received. EPA headquarters officials said that they could tailor community involvement procedures at sites, depending on the circumstances, but according to the officials, the minimum EPA requirements exceeded the simple notice procedures New Jersey used.

Greater Use of Presumptive Remedies

Texas officials said that their program's greater use of standard cleanup approaches—known as presumptive remedies—has significantly reduced the time and expense involved in the remedy-selection process. Presumptive remedies are remedies that have proven effective in cleaning up a particular kind of hazardous waste site and would presumably work at similar sites in the future. Such remedies can be viewed as off-the-shelf solutions that can be selected with less study of alternative remedies in the absence of site-specific conditions requiring such consideration. Because presumptive remedies allow the state to focus quickly on one or a limited range of remedies, they can save considerable time and expense in the remedy-selection process. On the basis of a comparison of a limited number of state sites, Texas officials estimated that the studies at presumptive remedy sites were less than half as costly as the full feasibility studies that were conducted at other sites. Officials of three other states said that they also had a greater number of presumptive remedies than did EPA.

EPA has also developed presumptive cleanup remedies for some types of NPL sites. However, as table 1 indicates, Texas has developed presumptive remedies for four contaminants—metals, semivolatile organic compounds,

pesticides, and polychlorinated biphenyls (PCB)—for which EPA has not.¹⁰ These contaminants are frequently found at Superfund sites.

Table 1: Comparison of EPA’s and Texas’s Presumptive Remedies

Type of sites	Has agency established a presumptive remedy for corresponding contaminant or type of site?	
	EPA	Texas
Metals	No	Yes
Volatile organic compounds	Yes	Yes
Semivolatile organic compounds	No	Yes
Pesticides	No	Yes
PCBs	No ^a	Yes
Municipal landfills	Yes	No ^b
Wood treater sites	Yes	No ^b

Note: Both Texas and EPA have established a presumptive remedy for groundwater as well.

^aEPA officials said that the regulations promulgated under the Toxic Substances Control Act provide EPA with guidance similar to a presumptive remedy for PCBs.

^bTexas officials said that the state’s contaminant-specific presumptive remedies generally cover municipal landfills and wood treater sites.

Source: Prepared by GAO from EPA’s and Texas Natural Resource Conservation Commission’s data.

Potential for Cleaning Up Sites at Lower Costs

Some states have adopted two practices that state officials believe result in less expensive remedies than those used in the Superfund program and that could be useful even at highly contaminated sites. These practices are (1) greater acceptance of remedies that contain waste on site rather than removing or destroying it and (2) more willingness to assume that sites will be used for industrial or commercial rather than residential purposes.

Acceptance of Containment Remedies

State officials in Illinois, Pennsylvania, and Texas told us that their states’ authorizing statutes do not contain a preference for permanent cleanup remedies.¹¹ Permanent cleanup remedies are those that remove or treat the principal waste threats, permanently eliminating hazardous waste from the site or reducing the volume, toxicity, or mobility of the waste, through

¹⁰EPA officials said that they expect to issue a presumptive remedy for metals in soil in early 1999.

¹¹Officials in Michigan, Minnesota, and New Jersey told us that although their state laws contain preferences for permanence in cleanup remedies, other considerations, such as costs, risk, and future land use, limit the applicability of the preference. Officials in Massachusetts said that their authorizing statute also contains a preference for permanence but not treatment and that containment remedies could be considered permanent if properly monitored and maintained.

techniques such as incineration or bioremediation.¹² Because the state programs lack such preferences, more nonpermanent containment cleanup remedies may be used. Nonpermanent remedies typically prevent human contact with contaminants by containing the waste in place—by, for example, placing a clay cap or a parking lot over contaminated soil, restricting the land’s use, or placing barriers around the contamination. These remedies tend to be less expensive to implement than permanent ones.

Although the states had no studies documenting cost reductions from containment remedies, some officials did cite cases in which cost savings resulted. Pennsylvania officials described how a change in the state cleanup statute that eliminated a preference for permanence had reduced cleanup costs for a site. The remedy proposed by the state for the site under the old statute—a \$30 million- to \$40 million-permanent remedy consisting of the excavation and treatment of contaminants—was changed with the passage of the new statute to an excavation and containment remedy with a cost of \$2 million to \$3 million. According to state officials, containment remedies remain protective of human health and the environment if properly controlled and maintained. We reported in April 1997 that cleanup managers for Illinois, Minnesota, and New Jersey estimated that containment methods were used for at least half of the cleanups of contaminated soil in their voluntary cleanup programs.¹³

In contrast, the Superfund program operates under the requirements of CERCLA, which establishes a preference for permanent remedies. EPA’s remedy-selection criteria require the selection of a permanent remedy to the maximum extent practicable, though other factors, such as cost and implementation concerns must also be taken into account. EPA officials said that they attempt to adhere to the preference whenever possible. EPA officials also noted that in recent years the agency has moved away from a “treatment for treatment’s sake” approach to one of applying treatment to principal threats. Principal threats include liquids, areas contaminated with high concentrations of toxic compounds, and highly mobile materials. According to a September 1997 EPA analysis, between 1988 and 1993, 70 percent of all remedies dealing with the source of contamination involved treatment, while in 1995, this number dropped to 53 percent. Where contaminants are left on site, EPA requires periodic site reviews to

¹²Incineration destroys waste by controlled burning at high temperatures, and bioremediation uses living organisms to remove pollutants from the soil, water, or wastewater.

¹³Superfund: State Voluntary Programs Provide Incentives to Encourage Cleanups (GAO/RCED-97-66, Apr. 9, 1997).

monitor and analyze the implementation and effectiveness of the containment remedies.

Consideration of Future Land Use

Some of the states believed that, in setting cleanup standards and selecting remedies, their cleanup programs were more likely than Superfund to determine that sites would be used for future industrial or commercial purposes rather than for residential purposes. The determination of how sites will be used in the future is important because a site whose expected use is industrial or commercial may be cleaned to less strict standards, resulting in less costly cleanups. The states that believe they base site cleanups on assumptions of industrial or commercial uses more readily than EPA have established specific cleanup standards for industrial sites.

Until several years ago, EPA generally assumed that a residential use of land was possible in the future, unless there was substantial evidence to the contrary. Because EPA cannot control local zoning or other institutional controls that restrict the land's use, its guidance suggested that those assessing the sites' risk assume that in the future the land would be residential even though no one was living there at the time. Critics contended that EPA was assuming residential uses for sites that would be used solely for industrial purposes in the foreseeable future. In 1995, however, EPA issued new guidance for considering future land use in making remedy selection decisions at NPL sites. The guidance encouraged parties cleaning up sites to collect as much information as possible about the site's future use and to obtain the local community's consensus regarding its future. Furthermore, EPA officials believe that as a result of this policy, EPA has evolved toward a new balancing of the various mandates contained in CERCLA and that now EPA is as likely as the states to opt for nonresidential future land-use scenarios. An EPA analysis found that only 38 percent of remedies selected in 1995 included residential land-use scenarios.

States did not have data to confirm their beliefs that they base cleanup decisions on future industrial or commercial uses of sites more often than does EPA. However, our April 1997 report noted that voluntary cleanup programs in four of the states we covered in our current review used industrial standards most frequently for their cleanups.¹⁴ Some states believed that EPA's requirement for obtaining a local community's consensus on the future uses of sites could make it more difficult to consider a land use other than residential. EPA officials, however, believe

¹⁴Superfund: State Voluntary Programs Provide Incentives to Encourage Cleanups (GAO/RCED-97-66, Apr. 9, 1997).

that early community involvement, with a particular focus on the community's desired future use of the property associated with an NPL site, can result in a more democratic decision-making process; greater community support for remedies selected as a result of this process; and more expedited, cost-effective cleanups. In addition, EPA officials said that communities were willing to accept cleanups based on continued nonresidential uses of sites.

State Liability Policies Are Intended to Reduce Litigation and Speed Up Cleanups

Two of the states we surveyed had adopted policies on the cleanup liability of parties associated with sites that they believed reduce litigation costs and encouraged faster cleanups. These policies involved reducing the liability of site owners and operators for cleanups and making the cleanup of municipal landfills a state responsibility.

Michigan Limits Liability for Owners and Operators

A Michigan law adopted in 1995 provides that the owners and operators of contaminated sites are liable only if they are responsible for an activity causing a release of hazardous substances into the environment. By contrast, under CERCLA, responsible parties—including owners and operators—are liable regardless of whether they actually caused the release. Thus, anyone seeking to recover cleanup costs under Michigan law from owners and operators must prove causation, while parties seeking to recover cleanup costs under CERCLA generally need not address the issue.

The causation standard, according to a state official, results in more expeditious cleanups of facilities because it reduces litigation and transaction costs and disruptions or delays. In addition, a Michigan survey of 33 municipalities indicated that the causation standard has facilitated the redevelopment of sites. A state official also noted, however, that some fraction of the contaminated sites that would have been cleaned up by owners and operators under a strict liability standard may need to be addressed at public expense.

Minnesota Assumes Cost of Closed Municipal Landfills

Minnesota state officials cited the state's Closed Landfill Program as a better way to clean up and care for landfills and protect innocent parties. Under this program, the state performs cleanup actions, takes over the long-term operation and maintenance of the cleanup remedy, and reimburses eligible parties for past cleanup costs. Although this approach is costly to the state, which assumes the cost of remediating the site, it reduces litigation costs and protects parties that may have made a very small contribution to site contamination but that could be caught up in

litigation if all contributors were liable. According to state officials, it is difficult to assign responsibility to the many parties that contribute to the contamination of municipal landfills, and very small contributors often face potentially bankrupting lawsuits. State officials said that it is preferable that the cost of addressing the problems of closed landfills be viewed as a societal cost. The officials said that Minnesota is the only state that has adopted this program, and it has signed an agreement with EPA to end federal involvement in 10 closed landfills on the NPL within the state.

In contrast, EPA's "polluter pays" approach, according to Minnesota officials, does not work well for most landfills, where a large portion of the waste comes from many small businesses and households. However, EPA is currently mitigating the impact of Superfund liability on the smallest contributors by offering expedited or low-cost settlements to parties that contribute small amounts of hazardous substances. These settlements protect the parties from further litigation.

EPA and Other Stakeholders Identified Potential Disadvantages of Applying State Practices to the Superfund Program

Environmental policy stakeholders that we interviewed, including EPA, state and national environmental organizations, and representatives of state and local government associations, generally did not dispute that the state practices had the efficiency benefits described by state officials. Some of the environmental organizations and a local government organization, however, identified potential risks of applying these practices to the Superfund program. Since the state practices can reduce cleanup costs, they are generally advantageous for businesses and others responsible for cleaning up sites. (See app. III for the list of stakeholders that we contacted.)

Stakeholders' Views on State Practices That Could Facilitate Faster Remedy Selection

The stakeholders that we contacted generally supported the broader use of presumptive remedies in the Superfund program. A representative of Resources for the Future (RFF), an independent environmental research organization, said that the use of presumptive remedies where particular contaminants predominate—as Texas does for pesticides, PCBs and semivolatile organic compounds—is a sound approach because there are only a limited number of ways to deal with certain contaminants. A representative of citizens groups and environmental organizations in Texas noted that presumptive remedies can make sense, as long as the remedies that have been designed are truly protective. Similarly, the representatives of an environmental organization cautioned that the value of presumptive remedies depends on the level of protection they provide.

EPA officials cited another advantage of presumptive remedies: consistency in remedy selection from site to site.

The stakeholders were more cautious about the use of preestablished standards to specify the goal of the remediation process without a site-specific risk assessment and with reduced public involvement. EPA regional officials believed that the use of the automatically applied standards without a risk assessment is more appropriate for sites that have fairly simple contamination problems, but would not be appropriate for the very large and complex sites that come under the Superfund program. Superfund sites can be over 100 acres, with 30 contaminant sources and 100 different contaminants, and according to EPA officials, using a look-up table would be too simplistic an approach to remedy selection at such sites. These tables are based on assumptions about exposure to contaminants that they said needed to be verified at more complex sites through a risk assessment. An Illinois official said, however, that the preestablished standards could be appropriate for portions of complex sites, even if they could not be used throughout the site.

Other stakeholders were not familiar with the details of the state cleanup standards. However, a representative of RFF said that while the standards may reduce debate about appropriate cleanup levels, there is a tradeoff involved if the standard is not sufficiently protective of public health. Representatives of the Sierra Club said that use of look-up tables to define the end goal can be overly simplistic, and it was important that parties responsible for the original contamination remain liable if events prove that the cleanup to specified standards was not adequate.

Regarding reduced requirements for public involvement based on a presumed lack of public interest, an EPA regional official said that low attendance at meetings arranged for public input may be less a reflection of public indifference than a sign that the public has not been sufficiently informed of issues surrounding a contaminated site. This official said that it is necessary to be very proactive in public outreach efforts. For example, he said that it may be necessary to contact churches in order to reach some ethnic communities. A representative of an environmental organization noted that while limiting public involvement may conserve resources in the short term, it may lead to greater costs in the long run if members of the public believe that they have been excluded from the process and decide to litigate. The representative emphasized that the Superfund cleanup process should produce no surprises, and an effective public involvement effort is critical.

Stakeholder's Views on Practices That Could Lead to Lower-Cost Remedies

The representatives of the environmental groups and others that we contacted, such as the Sierra Club, John Snow Institute, RFF, and EPA regions, generally believed that the states' lack of preference for permanent cleanup remedies and their greater readiness to consider that sites will not be used for residential purposes in the future tend to weaken the long-term effectiveness of site remediation programs. These groups were concerned that nonpermanent remedies, like clay caps designed to isolate contaminants, would not be maintained over time, and that institutional controls, like zoning or deed restrictions needed to prevent the residential or other higher-risk use of sites, would be changed or not enforced. Representatives of the International City/County Management Association (ICMA) said that the land-use and other institutional controls required by nonpermanent remedies require better cooperation and communication between state and local governments than often currently exists. Furthermore, according to an ICMA representative, a recent ICMA focus group indicated that many state and local officials do not fully appreciate the long-term demands—including oversight and enforcement—that institutional controls may place upon local governments. According to an EPA official, some contaminants cannot be contained over the long term (50 to 100 years) and that Superfund's preference for permanent cleanup remedies is necessary for such long-term protection. In addition, EPA officials said that the costs of long-term operations and maintenance of nonpermanent remedies may partially offset initial cost savings.

A report by RFF conducted under a grant from EPA,¹⁵ discussed the implications of basing remedy selection on land-use assumptions. The report stated that land-use categories (such as residential, industrial, and commercial) are used to estimate the future exposure of people to contaminants; yet the relation between land use and exposure is often not known and may vary widely. Anticipating the likely future use of a site is no easy task, according to the report, given the competing interests that want different land uses. The report noted that EPA does not have the authority to ensure that local land-use controls are maintained and enforced over time at sites where residual contamination precludes unrestricted use. Local land-use restrictions are typically the province of local government and private property law. The report observed that land-use controls are subject to various pressures, such as demands for property development, that may limit their effectiveness. Two major challenges result from a cleanup policy linking land use to remedy selection, according to the report: first, how to involve the public more

¹⁵Resources for the Future, *Linking Land Use And Superfund Cleanups: Unchartered Territory* (1997).

effectively in cleanup and reuse decisions, and second, how to ensure the effectiveness of property-use restrictions when the legal authority for such controls is the private property laws of each state.

Stakeholders' Views on State Liability Practices

Some stakeholders were not supportive of the changes Michigan made in its liability provision. A representative of the Michigan Environmental Council said that causation would increase public expense for cleanup and that because there would be fewer responsible parties available for cleanup, fewer contaminated sites would be remediated. According to an EPA official, CERCLA establishes a defense to liability for innocent landowners who obtain property without knowing that it was contaminated, despite taking due care to discover potential contaminants. However, an EPA official acknowledged that owners are generally unable to qualify for this defense because it is rare that an in-depth investigation of a contaminated site would not detect the contamination.

While not disagreeing with Minnesota's policy of assuming the cost of closed municipal landfills, representatives of the Sierra Club said that it is important that the policy not be extended to privately owned landfills because this would burden the taxpayers with costs that are the responsibility of a private party. EPA officials said that Minnesota's approach is a potentially very costly program from the government's standpoint, and EPA could probably not afford to adopt such a policy without significant additional funding.

Views on the Importance of the Superfund Program's Continued Role

Several state officials told us that, although they believe the practices of their state programs facilitate faster and less costly cleanup, they also wanted to stress the importance of an ongoing Superfund program. For example, officials in Massachusetts said that the existence of the federal program, with what they characterized as more daunting requirements and procedures than exist in state programs, was an important element in obtaining the cooperation of responsible parties in the state program. If these parties are not cooperative and the site is sufficiently dangerous, responsible parties risk being brought into the Superfund program.

Agency Comments

We provided a draft of this report to EPA for its review and comment. We spoke with EPA officials, including the Director of the State, Tribal, and Site Identification Center, in EPA's Office of Solid Waste and Emergency Response, to obtain the agency's comments. EPA generally agreed with the

description of the Superfund practices presented in the report but made technical comments and corrections, which we incorporated as appropriate. In addition, EPA officials said that the agency's recent administrative reforms had reduced the cost and duration of Superfund cleanups. The officials provided us with data on the cost and time savings achieved by certain of these reforms, which we included in our report. EPA also believed that the report should highlight the fact that containment remedies require long-term management and monitoring and may fail without such attention. We pointed out that this issue was addressed in the report's section summarizing stakeholders' views.

We also provided selected portions of this report to officials responsible for the state programs we discussed. We incorporated state comments and corrections as necessary.

Scope and Methodology

To identify practices that may facilitate cleanups of hazardous waste sites that are faster or less costly in comparison with the federal Superfund program, we selected seven states—Illinois, Massachusetts, Michigan, Minnesota, New Jersey, Pennsylvania, and Texas—with cleanup programs that are among the largest in the nation and that were recommended by various stakeholders—including EPA, industry organizations, and environmental groups—as states that had implemented time- and cost-saving practices. We then conducted interviews with these states' program officials, who identified and described program practices that, in comparison with the practices of the federal Superfund program, they believe facilitated faster or less costly cleanup of hazardous waste sites. We also reviewed pertinent laws, regulations, and other available documentation describing these practices. We did not independently verify the officials' statements regarding time and cost savings.

To identify issues that should be considered before these practices would be adopted by the Superfund program, we talked with officials from environmental and local governmental organizations, and EPA regional and headquarters offices. Where possible, we obtained references to these organizations from states and EPA. We interviewed officials in each of EPA's regional offices whose jurisdiction includes the selected states, environmental groups in the selected states, and national environmental groups.

We conducted our work from July through December 1998 in accordance with generally accepted government auditing standards.

As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 10 days from its date. At that time, we will send copies of this report to appropriate congressional committees; interested Members of Congress; the Administrator of EPA; state program managers; and other interested parties. We will also make copies available to others upon request.

Please call me at (202) 512-6111 if you or your staff have any questions. Major contributors to this report are listed in appendix IV.

Sincerely yours,

David G. Wood

David G. Wood
Associate Director, Environmental
Protection Issues

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Abbreviations

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EPA	Environmental Protection Agency
GAO	General Accounting Office
ICMA	International City/County Management Association
NPL	National Priorities List
PCB	poly-chlorinated biphenyls
RFF	Resources for the Future

State Program Profiles as of Fiscal Year 1997

State	Date program established	Principal statutes	State agency	Responsible program office	Staff employed/ authorized ^a
Illinois	1970	Environmental Protection Act Responsible Property Transfer Act	Environmental Protection Agency	Bureau of Land, Division of Remedial Management	105/105
Massachusetts	1983	Massachusetts Oil and Hazardous Material Release Prevention and Response Act	Department of Environmental Protection	Bureau of Waste Site Cleanup	203/230
Michigan	1982	Michigan Natural Resources and Environmental Protection Act	Department of Environmental Quality	Environmental Response Division	240/249
Minnesota	1993	Environmental Response and Liability Act	Pollution Control Agency	Hazardous Waste Division	80/80
New Jersey	1976	Spill Compensation and Control Act Industrial Site/Recovery Act Brownfield and Contaminated Site Remediation Act Water Pollution Control Act Solid Waste Management Act Underground Storage Tank Act	Department of Environmental Protection	Division of Publicly Funded Site Remediation, Site Remediation Program	512/512
Pennsylvania	1988	Hazardous Sites Cleanup Act Land Recycling and Environmental Remediation Standards Act	Department of Environmental Protection	Bureau of Land Recycling and Waste Management, Division of Land Recycling and Cleanup Programs	120/120
Texas	1985	Solid Waste Disposal Act Hazardous Substances Spill Prevention and Control Act	Natural Resource Conservation Commission	Office of Waste Management, Pollution Remediation Division	106/107

^aExpressed as full-time equivalents.

Source: GAO summary of information compiled by the Environmental Law Institute.

State Practices That State Officials Believe Facilitate Faster or Less Costly Hazardous Waste Site Cleanup

Practice	Illinois	Massachusetts	Michigan	Minnesota	New Jersey	Pennsylvania	Texas
Faster remedy selection							
Use of state standards documented in look-up tables as alternative to risk assessment	X	X	X	X		X	X
Less rigorous requirements for public involvement	X	X	X	X	X		
Greater number of presumptive remedies			X	X	X		X
Use of faster or less costly remedies							
No preference for permanence	X					X	X
Greater likelihood to determine that future site land use will be nonresidential	X	X	X		X	X	X
Liability practices							
Causation liability			X				
State assumes full cost of landfill cleanups					X		

Source: GAO summary of information provided by state officials.

List of Organizations GAO Contacted

Federal Agencies

Environmental Protection Agency — Headquarters
Environmental Protection Agency offices in regions I, II, III, V, and VI

State Agencies

Illinois Environmental Protection Agency
Massachusetts Department of Environmental Protection
Michigan Department of Environmental Quality
Minnesota Pollution Control Agency
New Jersey Department of Environmental Protection
Pennsylvania Department of Environmental Protection
Texas Natural Resources Conservation Commission

Environmental Organizations

The John Snow Institute, Center for Environmental Health
Michigan Environmental Council
Sierra Club, Headquarters
Sierra Club, State Chapters in Minnesota and Pennsylvania

Industry Organizations

Chemical Manufacturers Association¹
DuPont¹
U.S. Chamber of Commerce¹

State and Local Government and Other Organizations

Association of State and Territorial Solid Waste Management Officials¹
Environmental Council of the States¹
Environmental Law Institute¹
International City/County Management Association
Environmental Technology Council
Henry, Lowerre, Johnson, Hess and Frederick (Law firm representing environmental and community groups in Texas)
International City and County Managers Association
Resources for the Future

¹We contacted this organization in a preliminary phase of our work in order to obtain its views on the best states to survey.

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