# SUPERFUND'S FUTURE

## WHAT WILL IT COST?

*A Report to Congress*

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# Executive Summary

The debate about whether and how to reauthorize the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA)—better known as Superfund—has continued relatively unabated since 1986, when the law was last the subject of a major reauthorization. A central question now facing Congress is whether there is enough money in the Hazardous Substance Superfund (Trust Fund) to continue to pay for the program. If not, funds for the program will need to come from general revenues, unless the now-expired taxes that stocked the Trust Fund are reimposed. As a result, the question of whether, and when, the Superfund program will "ramp down" is a pressing concern.

To shed some light on this question, Congress asked Resources for the Future (RFF) to estimate the future cost of the Superfund program. More specifically, as part of the conference report that accompanied the FY 2000 Departments of Veterans Affairs and Housing and Urban Development, and Independent Agencies appropriations bill, RFF was asked to conduct an independent study to estimate how much money will be needed by the U.S. Environmental Protection Agency (EPA) to implement the Superfund program from FY 2000 through FY 2009. Congress identified six elements for the study:

1. the remaining cost of cleaning up the sites on EPA's National Priorities List (NPL) at the end of FY 1999—the sites at which the Agency can pay for long-term cleanups with monies from the Trust Fund;
2. the cost of cleaning up sites added to the NPL from FY 2000 through FY 2009;
3. the cost of conducting emergency response and removal actions, which are generally shorter in duration and less expensive than a typical NPL cleanup;

4. the cost of performing five-year reviews, which are required at most NPL sites to make sure that remedies remain protective over time;
5. the cost of implementing long-term response actions (a specific type of operation and maintenance activity) at NPL sites; and finally,
6. the cost of administering the Superfund program, including policy development, program support and management, rent, contract and information management, and accounting systems, as well as a number of Superfund-related programs at EPA and other federal agencies.

The total cost to EPA of implementing the Superfund program in FY 1999 added up to $1.54 billion.*

The congressional language requesting this report specifically excludes from our estimates the cost of cleaning up sites owned and operated by federal agencies (e.g., the Department of Energy and the Department of Defense), as well as the cost to EPA of overseeing these cleanups. The cost to EPA of carrying out the brownfields program is also excluded, as are Superfund costs to potentially responsible parties and state environmental agencies.

Several other aspects of the task assigned to RFF are important to note. First, our estimates represent the cost of implementing the program under current law—in other words, assuming no change in the law's existing liability or cleanup standards or in current EPA policies. Second, our estimates are not constrained by past funding levels. That is, our approach is to model the future work of the Superfund program and, based on that, derive estimates of the funds needed. To estimate future costs, we focus on EPA *expenditures*. Our estimates of the funds needed to implement the Superfund program thus reflect the amount of money EPA will actually spend each year. These estimates will need to be translated into obligations for the appropriations process.

It is important, at the outset, to acknowledge the uncertainty of the estimates presented in this report—an issue anticipated in the conference report language. Our main limitations are the quality of the data available and, of course, our ability to predict the future. Our analysis relies primarily on existing EPA information, although we collected new information in several key areas.

We address uncertainty by developing estimates under three scenarios—a base case, a low case, and a high case. For sites on the NPL as of the end of FY 1999 (which we refer to as "current" NPL sites), we vary the cost of cleanup actions in each scenario. For sites added to the NPL from FY 2000 through

*This does not include the cost of implementing parts of the Superfund program specifically excluded from the RFF study.

FY 2009 ("future" NPL sites), the three scenarios vary in terms of the number of sites listed each year, the percentage of sites with total expected cleanup costs of $50 million or more (mega sites), and the share of cleanup actions paid for with Trust Fund monies (Fund-lead actions). Each of the scenarios leads to a different workload for the Superfund program, which also affects our estimate of other program costs.

We cannot overemphasize that our estimates are just that, estimates. It is likely that our estimates for the next few years are more reliable than for later years and that our estimates of the remaining costs of cleaning up current NPL sites are more reliable than our estimates for future sites. Given the full body of our research, analyses, and interviews, the base-case scenario represents our best estimate of the future cost of the Superfund program; the low and high cases provide a range of likely future costs.

In the course of our research, we identified issues that deserve closer attention from EPA, Congress, and others charged with implementing the Superfund program. We summarize our major findings and conclusions below and then conclude with recommendations for four issues we think need to be addressed to improve the Superfund program.

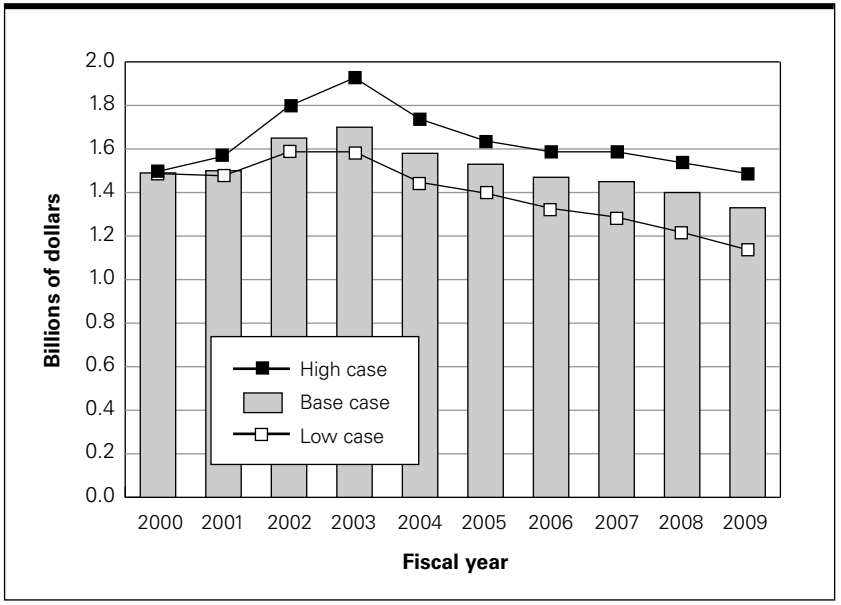
## Findings and Conclusions

### 1. A ramp-down of the Superfund program is not imminent.

Under the base-case scenario, which represents our best estimate of the likely future cost of the Superfund program under current law and policies, EPA's need for Superfund monies will not decrease appreciably below FY 1999 expenditures of $1.54 billion until FY 2006, as shown in Figure ES-1. In the base case, total annual costs peak in FY 2003, driven principally by the cost of Fund-lead actions at a few mega sites, and then begin a steady but small decline each year. In FY 2009, the final year of our estimates, the total annual cost under the base-case scenario is $1.33 billion, which is 14% less than FY 1999 expenditures. If inflation is taken into account, our estimate of the total annual cost of the Superfund program in FY 2009 under the base-case scenario is $1.61 billion, which would represent a 5% increase over FY 1999 expenditures.

Even under the low-case scenario, annual Superfund costs do not fall dramatically. In the low case, the estimated total annual cost to EPA of implementing the Superfund program does not drop below $1.4 billion until FY 2005, and below $1.2 billion until FY 2009.

**Figure ES-1.** Estimated Total Annual Cost to EPA of Superfund Program: Three Scenarios, FY 2000–FY 2009 (1999$)




Overall, from FY 2000 through FY 2009, our estimates of total annual costs under the low-case scenario average 15% less than under the high-case scenario. The difference between the annual costs of these two scenarios is more pronounced, however, in the latter years of this period. By FY 2009, the low- and high-case cost estimates are $1.14 billion and $1.49 billion, respectively—a difference of $350 million, or 23% of FY 1999 expenditures. If the low estimate is correct, program expenditures would fall substantially during the last few years of the FY 2000 through 2009 period. However, if the high case proves correct, program expenditures in FY 2009 would be just 3% less than in FY 1999.

## 2. The total estimated cost to EPA of implementing the Superfund program from FY 2000 through FY 2009 ranges from $14 billion to $16.4 billion.

We developed six program elements to address the requirements in the congressional language requesting this report, while taking into account limitations in how EPA's expenditure data are organized. Our estimates of future costs are organized around these six elements:

1. *removal program:* emergency response and other short-term cleanup actions at NPL and non-NPL sites, including enforcement and community involvement activities, as well as national policy development, management, and response support activities;
2. *remedial program:* site studies and response actions conducted primarily but not exclusively at NPL sites, as well as other site-specific activities, such as enforcement, oversight, and community relations;
3. *site assessment:* activities undertaken to evaluate the severity of contamination at sites and to determine what, if any, response is needed;
4. *program staff, management, and support:* national policy development and program management for the remedial program, as well as for the overall Superfund program, including enforcement policy and management, support activities, grants to state programs, and a variety of other efforts;
5. *program administration:* rent, facilities operation and maintenance, equipment and supplies, and activities not charged specifically to sites that are carried out by regional staff and headquarters staff in EPA's Office of Administration and Resources Management and Office of the Chief Financial Officer; and
6. *other programs and agencies:* Superfund-related work of offices within EPA, such as the Technology Innovation Office and the Office of the Inspector General, and at other federal agencies, such as the National Institute for Environmental Health Sciences.

Table ES-1 presents our estimates for the six elements and the total 10-year cost of the Superfund program under each of the three scenarios. Under the base-case scenario, EPA will need $15.1 billion for FY 2000 through FY 2009 to implement the Superfund program. Under the low-case scenario, we estimate that the total cost over these 10 years will be approximately $14 billion, or about 7% less than in the base case. Under the high-case scenario, we estimate that the 10-year cost will be $16.4 billion, or about 9% more than in the base case. If we take into account likely future inflation, the range of total costs for FY 2000 through FY 2009 is $15.6 billion to $18.3 billion.

## 3. Fund-lead actions at current NPL sites will be the major driver of EPA cleanup costs from FY 2000 through FY 2009.

EPA has made considerable progress addressing sites on the current NPL. At the end of FY 1999, the Agency had designated just over half (52%) of all nonfederal NPL sites as "construction-complete" (this increased to 57% by the end of FY 2000). Yet there is still considerable cleanup work to be done at

**Table ES-1.** Estimated Total Cost to EPA of Superfund Program: Three Scenarios, FY 2000–FY 2009 (Billions of 1999$)

| | Base Case | Low Case | High Case |
|---|---|---|---|
| Removal program | 3.18 | 3.18 | 3.18 |
| Remedial program | 6.55 | 5.71 | 7.55 |
| Site assessment | 0.58 | 0.58 | 0.58 |
| Program staff, management, and support | 2.69 | 2.51 | 2.89 |
| Program administration | 1.10 | 1.02 | 1.20 |
| Other programs and agencies | 1.01 | 1.01 | 1.01 |
| **Total** | **15.10** | **13.99** | **16.40** |

***Note:*** Totals may not add exactly because of rounding.

these sites. In fact, from FY 2000 through FY 2009, the estimated cost of Fund-lead actions at current NPL sites is much greater than that for actions at sites that will be added to the NPL.

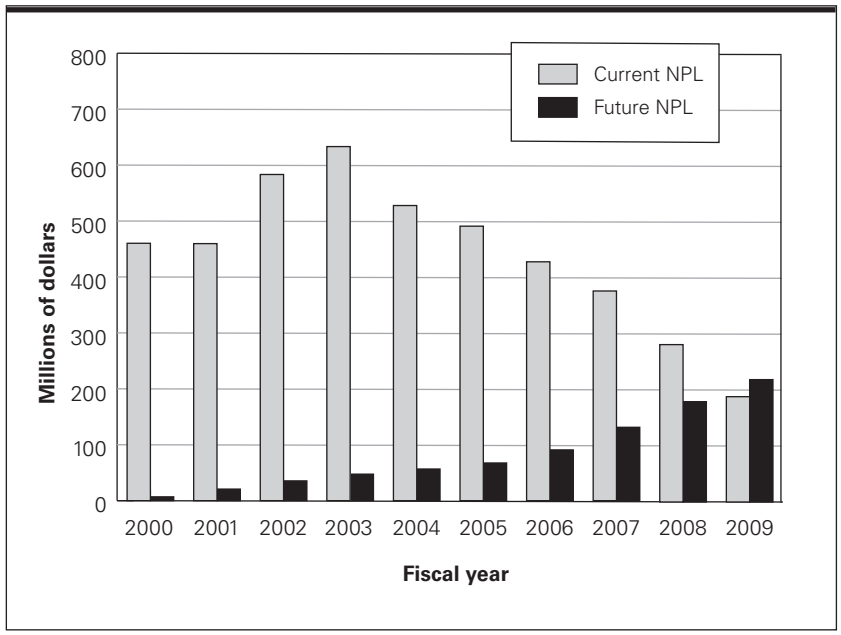
Figure ES-2 shows the annual cost of Fund-lead actions at both current and future NPL under the base-case scenario. Future NPL sites do not account for the majority of the annual costs of Fund-lead actions until FY 2009, even in the high-case scenario. (In the low-case scenario, Fund-lead actions at current NPL sites still constitute the majority of costs in FY 2009.) In aggregate, from FY 2000 through FY 2009, the total cost of Fund-lead actions at all NPL sites under the base-case scenario is $5.28 billion, 84% of which will be spent at current NPL sites.

## 4. The number, type, and cost of future NPL sites are each difficult to predict.

No other component of our estimates is as fraught with uncertainty as the future composition of the NPL. Based on our analysis of recent listing trends and our interviews with all 10 EPA regional offices and with 9 state superfund program managers, we estimate that 23 to 49 sites will be added to the NPL each year from FY 2001 through FY 2009. (We use the actual number of final NPL listings in FY 2000, 36 sites, in all three of our future NPL scenarios.)

Most attempts to forecast the size of the NPL, and the associated costs, have focused on estimating the number of final listings. The total number of sites, however, is only one piece of the puzzle. To estimate future costs, it is

**Figure ES-2.** Estimated Cost of Fund-Lead Actions at Current and Future NPL Sites: Base Case, FY 2000–FY 2009 (1999$)




equally important to predict the number of mega sites that will be listed on the NPL and the percentage of actions that will be Fund-lead.

In our interviews, EPA officials anticipated an increase in the number of mega sites likely to be listed on the NPL. The anticipated rise in mega sites is, in part, the result of increased attention to contaminated sediment and mining sites, as well as more focused efforts in a number of states and EPA regional offices to identify the sources contaminating municipal water supplies. In addition, EPA and state managers noted that some costly sites will almost certainly emerge unexpectedly. The average cleanup cost of a mega site is approximately $140 million, more than 10 times that of a nonmega site, which has an average cleanup cost of about $12 million.

Both EPA and state superfund managers expect an increase in the percentage of nonmega sites where cleanup will be paid for with Trust Fund monies. There are two major reasons why this is the case. First, state agencies prefer to address sites under their own programs when responsible parties are financially viable and cooperative—that is, when site cleanups do not require public funds. Second, a typical nonmega NPL site is too expensive for even a well-financed state superfund program to pay for with its own resources. The

result is that sites where Trust Fund monies are needed for cleanup are more likely to end up on the NPL.

The availability of state funds to clean up contaminated sites is only one factor that affects whether a state wants a site listed on the NPL. States with less well-financed superfund programs, or no state superfund program at all, often have not been able to muster the political support to place sites on the NPL. On the other hand, states with mature programs and considerable legal and technical expertise often turn to EPA when sites require federal enforcement authority or involve the relocation of residents. Counterintuitively, states generally perceived to have strong, well-funded superfund programs, such as California, Pennsylvania, New Jersey, and New York, have listed the most sites on the NPL.

Forecasting future NPL sites is also complicated by EPA's policy, in place since 1996, of obtaining the governors' concurrence before listing sites on the NPL. Whether a governor wants a site listed depends on various political and economic factors. Thus, even if it were possible to identify all "NPL-caliber" sites not currently on the NPL, that alone is not sufficient to confidently predict the number of future listings.

The cost of the federal Superfund program to state environmental agencies is an increasingly important concern to states. States are liable for two major expenses related to Fund-lead cleanups: 10% of the cost of remedial actions, including long-term response actions (activities aimed at groundwater and surface water restoration), and 100% of the cost of operation and maintenance activities for Fund-lead remedies. States are beginning to feel the financial pinch, especially at mega sites where long-term response actions can cost millions of dollars annually, as more NPL sites reach the latter stages of the cleanup process.

## 5. Additional information is required to assess the level of resources needed for program management, policy, and administrative support functions to implement the Superfund program.

We found it difficult to understand, much less evaluate, the level of Superfund resources going to program management, policy, and administrative support functions. EPA spends a large portion of its annual Superfund budget on these activities. The costs incurred are primarily associated with personnel and fall into two categories:

- Superfund staff in four EPA headquarters offices: the Office of Solid Waste and Emergency Response, the Office of Enforcement and Compliance Assurance, the Office of Administration and Resources Management, and the Office of the Chief Financial Officer. Within the scope of this study, we were not able to determine the appropriate size of these offices for the future Superfund program.
- Staff in EPA regional offices who work on the Superfund program but do not charge their time to site-specific accounts in the Agency's financial management system. A surprisingly large proportion of regional Superfund staff time is not charged to site-specific accounts, for reasons that are not readily apparent.

Absent better information about what activities are being conducted by these staff, it is difficult to assess where current resources are going and whether current funding levels are appropriate.

## 6. Post-construction activities are increasingly important to ensure the success of the Superfund program.

Post-construction activities are a crucial part of the Superfund program. These activities include reviews of site remedies—to ensure that they remain protective of human health and the environment—and, for many sites, long-term response action, among other efforts. EPA has historically placed less emphasis on these activities than on remedial cleanup actions. The annual cost to EPA of implementing post-construction activities is relatively small, with the notable exception of long-term response actions at mega sites.

Five-year reviews of site remedies, many of which are required by statute, provide useful information about whether remedies are actually protective and whether additional funds—from either EPA or responsible parties—may be needed in the future. For this reason, we evaluated 151 recently completed five-year review reports.

Our evaluation indicates that EPA needs to improve the quality of these reviews as well as determine whether the recommendations made in the reports have actually been implemented. Ignoring its own guidance, the Agency sometimes concludes that remedies are protective when, in fact, they are incomplete because remedies were not fully implemented, are not functioning as designed, or are unlikely to meet cleanup objectives on schedule. This was the case in almost half of the five-year reviews we examined in which EPA had deemed the remedy at the site protective of human health and the environment.

The results of the five-year reviews provide a useful indication of the future investment that may be needed to ensure that remedies remain protective over time. It is, however, too soon to estimate the magnitude of the future liabilities that will be incurred when some remedies are found to be in need of repair or insufficient.

## Recommendations

There are four major issues that we believe need to be addressed by EPA, Congress, and state environmental agencies, in consultation with the full array of Superfund stakeholders. Our recommendations have a common goal: to help formulate a clear mission for the Superfund program and to improve its effectiveness and efficiency.

### 1. Review and clarify the purpose of the National Priorities List.

It is clear from our interviews with both EPA and state officials that even as the Superfund program enters its third decade, what types of sites should be on the NPL is an unresolved question. That is, the *purpose* of the NPL is unclear. This is not to suggest that the NPL should be so rigidly defined that it precludes regional and state flexibility in determining which sites to list and which sites to address under other cleanup programs. Nevertheless, we recommend that EPA, with the involvement and input of other Superfund stakeholders, should take the following actions.

- Decide whether contaminated sediment and mining sites should be listed on the NPL in greater numbers or whether a separate program or approach is needed. This is an issue that ultimately Congress will have to address, given the potentially dramatic cost implications for the Trust Fund.
- Establish a process for identifying potential NPL sites. Such a process will require coordination with other EPA programs, as well as with state agencies. As part of this effort, EPA should issue periodic reports to Congress outlining recent listing trends, the types of sites the Agency expects to list on the NPL in coming years, and their cost implications.
- Review the governor's concurrence policy to determine whether allowing a state to, effectively, veto the listing of a site that EPA believes should be on the NPL is compromising the effectiveness of the Superfund program.
- Sponsor an independent study of states' financial capacity to pay for state-funded cleanups and their share of Fund-lead actions, as well as the implications that this has on the Superfund program.

## 2. Assess the level of program management, policy, and administrative support resources needed to implement the Superfund program.

EPA spends a large portion of its annual Superfund budget on management, policy, and administrative support activities. Clearly, these offices and the functions they perform are important. However, to ensure that all resources currently devoted to these efforts are, in fact, needed, we recommend that EPA conduct two studies:

- Evaluate the staffing level and cost of program management, policy, and administrative support functions of the Superfund program to better understand the activities conducted and the staffing and resources required.
- Determine why a large percentage of the activities conducted by staff in the 10 EPA regional offices is charged to nonsite accounts, even though, according to EPA managers, most of the staff spend most of their time working on site-specific activities.

## 3. Improve the management and financial systems for tracking Superfund progress and costs.

To conduct this study, we relied heavily on two major EPA internal information systems, the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) and the Integrated Financial Management System (IFMS). We encountered many instances of incorrect data, inconsistent coding, and poor quality control in both systems. In IFMS, the proliferation of codes makes it difficult to use the data to assess the full cost of individual Superfund program actions and activities. We recommend that EPA take the following actions.

- Conduct a rigorous top-to-bottom review of the purpose, structure, and management of CERCLIS and IFMS and evaluate whether these systems are meeting the needs of senior Agency decisionmakers. This review should not be carried out by those responsible for day-to-day management of the systems and should involve outside experts in financial management, information systems, and the Superfund program.
- Revamp CERCLIS to minimize the incidence of incorrect and outdated information.
- Streamline and improve IFMS (and its successor system, now in development) to enhance its usefulness for analyses of the cost of individual components of the Superfund program.

- Improve quality control procedures, communication, and training of users of CERCLIS and IFMS throughout the Agency to ensure greater uniformity in coding practices.

## 4. Give higher priority to post-construction activities.

EPA, the states, and responsible parties have made significant progress in cleaning up NPL sites. EPA must now ensure that the remedies in place at these sites remain protective of human health and the environment over the long term. To fulfill this obligation, we recommend that EPA take the following steps.

- Review and clarify the definition of the "statement of protectiveness" used in five-year reviews and ensure that the Agency follows its own guidance when evaluating the protectiveness of remedies.
- Create and maintain a system that compiles the recommendations made in five-year review reports and establish a mechanism to make certain that the recommendations are, in fact, implemented.
- Develop a system to track the monitoring and implementation of institutional controls at NPL sites.
- Improve public access to five-year reviews by increasing their clarity and posting the five-year review reports on the EPA website.

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We believe that the above recommendations will contribute to a more effective Superfund program in the years to come.