Fixing Superfund

The Effect of the Proposed Superfund Reform Act of 1994 on Transaction Costs

Lloyd S. Dixon
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Lloyd S. Dixon
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This report focuses on the possible effect of the proposed Superfund Reform Act of 1994 on *transaction costs*—costs resulting not from cleanup but from assigning liability for cleanup among the various parties. It should be of interest to those involved in the debate over how to make the Superfund program more effective and efficient in cleaning up inactive or abandoned hazardous waste sites.

Because this study focuses on transaction costs, it does not address other important effects of the proposed legislation. For example, this report does not discuss the effect of the proposed reforms on EPA's budget or on the relationship between the costs of Superfund cleanups and the benefits of cleanups for human health and the environment.

The analysis presented here is based on previous work on transaction costs performed at RAND and on telephone interviews with various stakeholders in the Superfund process. Stakeholders interviewed include representatives of large and small potentially responsible parties, insurers, reinsurers, the Environmental Protection
Agency, the Department of the Treasury, environmental groups, and researchers.

The project was sponsored by the Institute for Civil Justice at RAND.
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The Superfund program, established in 1980 to clean up the nation's worst inactive hazardous waste sites, has been criticized for generating excessive transaction costs—costs resulting not from cleanup but from assigning liability for cleanup among the various parties. The Superfund Reform Act of 1994 proposes changing the program's operation to reduce these costs. This report assesses whether reforms such as those embodied in the proposed legislation are likely to be successful. The legislative process is not yet complete as we go to press, and we focus on the reform act as proposed by the Clinton Administration in February 1994 and modified with more complete insurance provisions in April 1994. When appropriate, however, we reference congressional amendments being considered.

We evaluate the provisions of the proposed legislation according to their effect on three central attributes of the Superfund process:

- Complexity: Does the provision make the Superfund process simpler or more standardized?
• Division of tasks: Does the provision assign a task to the party able to perform it most efficiently?

• Incentives: Does the provision give key players the appropriate incentives to cooperate rather than to contest?

Our evaluation draws on the quantitative findings of prior RAND research as well as on discussions with many Superfund participants conducted during that research. We have supplemented these data with additional telephone interviews with stakeholders in the Superfund process, including representatives of potentially responsible parties (PRPs), insurers, reinsurers, the Environmental Protection Agency (EPA), the Department of the Treasury, environmental groups, and research organizations. We make no attempt to present the views of different stakeholders systematically. Rather, we use the reactions of the various stakeholders to inform the analysis and assessment.

SUPERFUND GENERATES SUBSTANTIAL TRANSACTION COSTS

Previous RAND work suggests that the Superfund program has generated substantial transaction costs. RAND estimated that the overall transaction-cost share was 32 percent of total expenditures by PRPs through 1991 at all sites on the National Priorities List. Transaction-cost shares for insurers were even higher—88 percent of outlays between 1986 and 1989. These estimates imply that 36 percent of the approximately $11.3 billion spent by the private sector at Superfund sites through 1991 went to transaction costs rather than to cleanup. What the costs will be when cleanup is completed is very uncertain. We estimate the final private-sector transaction-cost share between 23 and 31 percent.

INTERACTIONS AMONG KEY PLAYERS GENERATE TRANSACTION COSTS

The Superfund process generates transaction costs because it creates a complex set of interactions among the different players and provides many opportunities for the parties to contest the amount of their liability. We focus on five key interactions.
PRP-Government Interaction. EPA and PRPs generate transaction costs when they argue over the cleanup standards and the remedy and negotiate settlements.

PRP-PRP Interaction. PRPs must allocate liability among themselves, agree on common negotiating positions with EPA, and try to recover costs from nonparticipating PRPs.

PRP-Insurer Interaction. PRPs negotiate and litigate with their insurers, to whom they turn for reimbursement of legal and cleanup costs.

Insurer-Insurer Interaction. Insurers may, in turn, seek compensation for their costs from their reinsurers.

Community-PRP and Community-Government Interactions. The community around a site may oppose cleanup decisions that have been made and may slow or stop the cleanup process. Local residents may also bring bodily injury and property damage suits against PRPs.

Throughout the Superfund process, each of the key players implicitly or explicitly weighs the costs and benefits of cooperating with the process or contesting it. The incentives to contest rather than to cooperate in large part determine the size of the transaction costs.

The proposed legislation seeks to lower transaction costs by reducing the incentives of PRPs and their insurers to contest liability and by simplifying the process and making more efficient task assignments to the participants. The legislation’s provisions focus on the key aspects of the interactions among the players: allocating liability, negotiating settlements, recovering costs from nonparticipating PRPs, determining cleanup standards and selecting remedies, involving the community, and negotiating with insurers and reinsurers.

TRANSACTION-COST SCORECARD

Figure S.1 summarizes our assessment of how the proposed legislation would affect transaction costs. The key interactions appear as the column heads, and aspects of the Superfund process addressed by the proposed legislation are the row labels.
The proposed legislation seems likely to reduce transaction costs generated by the major interactions among PRPs. But the overall effect on transaction costs generated from the PRP-government interaction is unclear. On the one hand, settlement terms appear much more favorable to PRPs, who thus should have less incentive to fight liability. On the other hand, some of the transaction-cost savings among PRPs come at the price of increased transaction costs for EPA, and many critical issues in setting cleanup standards and selecting remedies remain unresolved. If the insurance provisions of the legislation pass an early vote by PRPs, the legislation should simplify the interactions between PRPs and their insurers and reduce PRP incentives to pursue insurers in court. The legislation would probably also reduce insurer-reinsurer transaction costs to the extent that it reduces PRP-insurer transaction costs. But the enhanced commu-
nity involvement provided for by the legislation may increase trans-
action costs between the community and the government because of
the increased complexity of the decisionmaking process, combined
with the likely persistence of divisions within the community. The
proposed legislation may also increase transaction costs between the
community and PRPs if increased information about the site gener-
ates more bodily injury and property damage cases.

The Superfund Reform Act of 1994 would fundamentally change the
way the Superfund program operates. Although the process would
remain complex, important components would be simpler and more
standardized. The legislation reassigns several tasks to parties better
qualified to perform them, and it appears to give PRPs far greater in-
centives to cooperate rather than to contest settlements. Some
troubling features remain, but the legislation takes a significant step
toward reducing the resources devoted to litigation rather than to
cleanup.
Many people made key contributions to the project. Deborah Hensler's insightful comments helped shape the overall approach and interpretation of the findings. Mary Vaiana helped enormously in sharpening arguments and improving the clarity of presentation.

Many individuals closely involved with the Superfund process took the time to interpret and discuss the advantages and disadvantages of the Administration's proposed reforms. They include representatives of small and large potentially responsible parties, insurers, reinsurers, the Environmental Protection Agency, the Department of the Treasury, environmental groups, and researchers. Their input is greatly appreciated.

This report benefited greatly from many comments on an initial draft. Don Clay, Louise Parker, and Kevin McCarthy were the reviewers for RAND's formal review process. Helpful comments were also provided by David Aylward, Warren Azano, Robert Frantz, Steven Garber, Robert Gillingham, Tom Gillis, James Hammitt,
Edwin Huddleson III, Steven Middlebrook, Martin McCrory, and Robert Nakamura.

I would finally like to thank Pat Williams for her help in making corrections and producing the document, and Marian Branch for skillful editing.

Of course, responsibility for any errors or omissions remains with the author.
Policymakers, interest groups, and many participants in the federal Superfund program have claimed that the program's liability approach causes delay and generates excessive transaction costs—costs resulting not from cleanup but from assigning liability for cleanup among the various parties. Superfund is due to be reauthorized this year, and in February 1994 the Clinton Administration presented to Congress the Superfund Reform Act of 1994. The legislation attempts to respond to many of the criticisms of the program; in particular, changes in the way the program operates are designed to reduce the proportion of public- and private-sector resources that go to litigation rather than to cleanup.

This report assesses whether reforms such as those embodied in the proposed legislation are likely to reduce transaction costs. As we go to press, the details of the legislation are not yet final. There may well be important changes made to the Administration proposal during the legislative process, but it is likely that the basic structure will remain the same. In the analysis that follows, we focus on the Administration proposal but, when appropriate, reference some of the amendments that are being considered.
We evaluate provisions of the proposed legislation according to their effect on three central attributes of the Superfund process:

- **Complexity**: Does the provision make the Superfund process simpler or more standardized?
- **Division of tasks**: Does the provision assign a task to the party able to perform it most efficiently?
- **Incentives**: Does the provision give key players the appropriate incentives to cooperate rather than contest?

These three attributes underlie much of what generates transaction costs.

Complexity, by itself, can be a major factor in generating transaction costs. Even if firms are willing to cooperate in the cleanup process, a cleanup process that requires many steps and interactions may still generate substantial transaction costs.

How tasks are divided also influences transaction costs. The cleanup process that generates the least transaction costs will assign tasks to parties that can do them at the lowest cost.

Each player in the Superfund process must repeatedly decide whether to settle or fight liability. In doing so, players presumably weigh the costs and benefits of each strategy. To lower transaction costs, the participants must be given incentives to cooperate rather than to contest.

Our assessment focuses on the effect of the proposed legislation on transaction costs. We do not treat other important aspects of the legislation—for example, how proposed reforms might affect the Environmental Protection Agency’s (EPA) budget, or what the relationship is between Superfund cleanup costs and the benefits of cleanups for human health and the environment.

The remainder of this chapter provides a context for our assessment. We describe the current Superfund process, discuss the magnitude and source of transaction costs, and describe our research approach.
HOW SUPERFUND WORKS NOW

The Superfund program was established by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) to clean up the nation's worst inactive hazardous waste sites. It was reauthorized by the Superfund Amendments and Reauthorization Act in 1986 and was extended through 1994 as part of the Budget Reconciliation Act of 1990.1 Many states have adopted laws similar to the federal statute and have set up their own Superfund-like programs.

Rather than adopting a pure public works program funded by tax revenues, Congress chose to emphasize a liability approach: Parties that generated or transported the hazardous materials at a site or who owned or operated the site (termed potentially responsible parties [PRPs]) are liable for cleaning it up. The rationale for the liability approach was to make polluters pay for the cleanups, to shift the cleanup burden from the public to the private sector, and to create strong incentives for firms to handle hazardous substances more carefully.

The potentially responsible parties at a site face strict, joint and several, and retroactive liability.

- **Strict liability** means that a PRP can be held liable for cleanup costs even when there was no negligence at the time of disposal.
- **Joint and several liability** means that a PRP can be held liable for cleaning up an entire site even if it was responsible for only a small share of the waste at the site.
- **Retroactive liability** means that liability applies to actions that took place before the 1980 law was passed.

The Superfund program is designed to persuade private parties either to perform or to pay for hazardous waste cleanups, but the record to date is not impressive. Since 1980, EPA has put 1,177 non-federal sites on the National Priorities List (NPL), but construction of the cleanup remedy has been completed at only 217 (EPA, 1993a, pp.

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1Program and funding authorities expire September 30, 1994, and taxing authority expires December 31, 1995.
What is more, at upwards of 40 percent of the 217 sites, EPA had determined that either no cleanup or relatively minor cleanup was required (General Accounting Office [GAO], 1993a, p. 3).

Perhaps contributing to the slow pace of cleanup, PRPs and their insurers are spending considerable amounts contesting liability, which means that substantial resources are spent determining who is going to pay, not cleaning up the sites. High transaction costs have probably attracted more criticism than any other aspect of Superfund.

How high are these costs?

SUPERFUND GENERATES SUBSTANTIAL TRANSACTION COSTS

Two RAND studies suggest that the transaction costs associated with Superfund are substantial (see Table 1.1). A 1992 study of five very large industrial firms with annual revenues over $20 billion found that transaction costs were 19 percent of their total expenditures at 49 NPL sites between 1984 and 1989. A 1993 study of 108 smaller

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<td>&gt;$20 billion</td>
<td>19</td>
<td>—</td>
</tr>
<tr>
<td>$1–$20 billion</td>
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<td>19</td>
</tr>
<tr>
<td>$100–$1,000 million</td>
<td>—</td>
<td>15</td>
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<tr>
<td>$15–$100 million</td>
<td>—</td>
<td>60</td>
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<td>&lt;$15 million</td>
<td>—</td>
<td>60</td>
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Nonfederal sites exclude facilities such as military bases and weapon production facilities. Construction complete means that all phases of the site cleanup plan have been performed and that EPA has determined that no additional construction actions are required at the site. At some of these sites, however, cleanup may not be complete because long-term operations may be required, such as pumping and treating groundwater.
PRPs at 18 NPL sites also found that transaction costs were 19 percent of total expenditures between 1981 and 1991 for firms with annual revenues between $1 and $20 billion, and 15 percent for firms with annual revenues between $100 million and $1 billion. Transaction-cost shares were much higher for smaller firms. Those with annual revenues less than $100 million averaged shares of 60 percent.

Extrapolating the sample results to all PRPs at a set of 18 study sites, RAND estimated that the overall transaction-cost share was 32 percent of total private-sector PRP expenditures through 1991.³

RAND also reported the transaction-cost shares of four national insurers on claims involving inactive hazardous waste sites. Eighty-eight percent of their outlays between 1986 and 1989 were found to be transactional, with coverage disputes and payments to defend policyholders (i.e., payments for policyholders’ lawyers) accounting for the bulk of the transaction costs (Acton and Dixon, 1992, p. 24).

Overall private-sector expenditures are the sum of PRP and insurer expenditures. Taking 32 percent and 88 percent as reasonable estimates of PRP and insurer transaction-cost shares through 1991, we estimate that transaction costs were 36 percent of overall private-sector expenditures through 1991 (see Table 1.2) and that overall private-sector expenditures were approximately $11.3 billion. We estimate that insurer outlays accounted for about 10 percent of the total. (The assumptions behind these estimates are detailed in the Appendix.)

Perhaps more relevant to the policy debate than the transaction-cost share part way through the cleanup process is the transaction-cost share when cleanup is complete.⁴ In its 1993 study, RAND predicted ultimate PRP transaction costs at the 18 study sites under three dif-

³Although the 18 study sites were chosen to be representative of all NPL sites with substantial private-sector PRP expenditures through 1991, the sample is small. Thus, there is considerable uncertainty that the transaction-cost share at the 18 NPL sites is representative of private-sector expenditures at all NPL sites through 1991. There is considerable uncertainty (1) because only a fraction of the PRPs at the 18 study sites were sampled, and (2) because only a fraction of the sites on the NPL were sampled.

⁴In its 1993 study, RAND found that transaction-cost shares were lower in later stages of the cleanup process. This finding suggests that the cumulative transaction-cost
Table 1.2
Private-Sector Transaction-Cost Shares at 18 Study Sites
Through 1991 and at Completion
(\%)

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<th>Sector</th>
<th>Through 1991</th>
<th>At Completion</th>
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<tbody>
<tr>
<td>PRPs</td>
<td>32</td>
<td>19-27</td>
</tr>
<tr>
<td>Insurers</td>
<td>88</td>
<td>69</td>
</tr>
<tr>
<td>TOTAL</td>
<td>36</td>
<td>23-31</td>
</tr>
</tbody>
</table>

...ferent scenarios. The resulting range was 19 to 27 \(\%\). Combining this range with the insurer transaction-cost share for claims closed through 1989 (69 \%\) results in a final private-sector transaction-cost share between 23 and 31 \%\) (see the Appendix for calculations).

The transaction costs of local, state, and federal governments must be added to those of the private sector to determine the overall transaction costs generated by the Superfund process. Thirteen \(\%\) of EPA’s 1993 $1.6 billion Superfund budget was for enforcement, clearly a transaction cost (EPA, 1993a, p. IV-2). However, we do not know what part of the remaining 87 \%\) of EPA’s Superfund budget is transactional, and a comprehensive analysis of state and local spending is yet to be done.

The findings of these RAND studies support claims that transaction costs are a serious problem in the Superfund program. What are the sources of these costs?

**COMPLEX INTERACTIONS AMONG KEY PLAYERS GENERATE TRANSACTION COSTS**

The Superfund process generates transaction costs because it creates a complex set of interactions among the different players and provides many opportunities for the parties to contest the amount of share may be lower when cleanup is complete at all NPL sites than it was through 1991.
their liability. Figure 1.1 illustrates some of the key interactions in the Superfund process. Below we highlight five.

**PRP-Government Interaction.** The Superfund process requires the government and the PRPs to interact in a variety of ways. At each site on the NPL, EPA attempts to negotiate cleanup agreements or recover cleanup costs from the PRPs at the site. Some PRPs participate, and others attempt to avoid liability altogether. Transaction costs are generated in arguing over the cleanup standards and the remedy, and in negotiating settlements. States are frequently involved in setting cleanup standards and selecting remedies, further complicating the process.

**PRP-PRP Interaction.** Negotiations take place among the participating PRPs, who must allocate liability among themselves. Because EPA wants to negotiate with a PRP committee rather than with individual PRPs, PRPs must agree on common negotiating positions. In addition, some PRPs attempt to avoid liability at the site, and the participating PRPs seek to recover costs from these nonparticipating PRPs, usually through the courts.

![Diagram](image-url)

**Figure 1.1—Key Players in the Superfund Process**
**PRP-Insurer Interaction.** PRPs also negotiate and litigate with their insurers, to whom they turn for reimbursement of legal and cleanup costs. These claims are typically brought under comprehensive general liability and commercial multi-peril policies, but whether the policies cover these claims is usually hotly contested.

**Insurer-Reinsurer Interaction.** Insurers may seek compensation for their costs from their reinsurers. Even though many insurers have notified their reinsurers of potential claims, it appears that reinsurer expenditures have only recently begun to grow—perhaps because of the very high deductible for most reinsurance policies. However, conflicts between insurers and reinsurers may increase over time if insurers' costs rise.

**Community-PRP and Community-Government Interactions.** The local community around a site interacts both with the government and with the PRPs. The community may want to provide input into remedy selection and cleanup standards. It may also oppose cleanup decisions that have been made and slow or stop the cleanup process. Local residents and landowners sometimes bring bodily injury and property damage suits against the PRPs at the site.

**PLAYERS WEIGH DECISION TO COOPERATE OR CONTEST**

Throughout the Superfund process, PRPs and insurers presumably weigh the costs and benefits of contesting the amount of their liability. For both PRPs and insurers, the costs include the time of in-house staff and the costs of external legal counsel and expert advice. The perceived gains depend on the extent to which the PRP or insurer thinks it can affect the outcome and the overall stakes involved. For example, a PRP may think fighting with other PRPs over allocation may reduce its allocated share by 5 percentage points, which would amount to $2.5 million at a site that costs $50 million to clean up. Similarly, insurers may believe that vigorously contesting coverage issues will significantly reduce their liability.

PRPs and insurers presumably also figure the time value of money into their calculations. A negotiating tactic that delays settlement for a few years would allow a PRP or insurer to earn the real rate of interest on the settlement amount during the interim.
PRPs and insurers may consider how contesting liability affects the political process. For example, even though the costs may be high relative to the recoveries they could ever hope to achieve, PRPs may attempt to recover costs from small businesses that contributed only a very small share of the waste at the site. The rationale is that cries of pain from this politically influential interest group may create pressure to reform the Superfund process.

As a regulatory agency rather than a profit-making firm, EPA has a different set of goals. EPA is under pressure from Congress to conserve its funds and thus to recover as much of the cleanup costs from PRPs as possible. However, EPA is also under pressure from many members of Congress and from environmental and other interest groups to move quickly ahead with cleanups and adopt stringent remedies. Thus, EPA must balance its own potentially conflicting goals while trying to interact with other players in a way that motivates them to cooperate with the process.

The incentives to contest rather than to cooperate in large part determine the size of the transaction costs generated by the Superfund process. The proposed legislation seeks to reduce transaction costs by reducing the incentives of PRPs and their insurers to contest liability, and also by simplifying the process and assigning tasks to the different parties in a more efficient way. The next section describes the key features of the legislation.

**KEY FEATURES OF THE PROPOSED LEGISLATION**

The Administration’s proposal was introduced in Congress on February 3, 1994, as H.R. 3800 by Representative Al Swift, who then proposed, with Administration support, more complete insurance provisions in April 1994. The key features are

1. Joint and several liability would not be explicitly eliminated, but liability would be *de facto* proportional for parties who settle.

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5These features may be modified during the congressional debate, and the bill as enacted may differ substantially from the Administration’s proposal.
2. Allocation would no longer be left to the PRPs. Instead, a neutral allocator would assign shares to PRPs, based on a number of factors, including volume, toxicity, and degree of care taken in handling the hazardous substances. EPA would pick up the "orphan share"—the share of identified PRPs that are nonviable because they are bankrupt or out of business.

3. On the basis of these allocations, EPA would offer PRPs settlements with a full release from liability. In return, the PRPs would pay a settlement premium to cover the risks of cost overruns, remedy failures, and other uncertainties.

4. EPA, not the participating PRPs, would pursue the nonsettlers. To provide an added incentive to settle, EPA would be able to recover not only the nonsettlers' allocated share but the orphan share as well.

5. De micromis parties (those who sent only very small amounts of waste to the site) would be released from liability altogether, and EPA would offer settlements to other small contributors (de minimis parties) as early as possible in the cleanup process.

6. Generators and transporters of municipal waste would be required to pay no more than 10 percent overall of the cleanup costs at a site; EPA would pick up the remainder of their allocated share.

7. To simplify the process for setting standards and selecting remedies, some vague and hard-to-determine cleanup standards would be eliminated, and EPA would develop national cleanup standards and generic remedies.

8. To provide a more flexible choice of remedies, the proposed legislation allows future land use to be considered in setting cleanup standards.

9. The current remedy preference for treating waste would be limited to the most contaminated parts of the site (hot spots), and containing waste would become a more accepted remedy.

10. To reduce contention between PRPs and insurers, the legislation proposes an Environmental Insurance Resolution Fund to settle insurance claims related to Superfund sites. A stay would be
placed on all insurance claims related to NPL sites, and PRPs could request an insurance settlement from the resolution fund.

11. If PRPs reject the offer from the fund, they would be able to pursue their insurers in court. To discourage such suits, the legislation holds PRPs liable for a portion of insurer legal costs if the court settlement is less than the fund's offer.

12. To reduce community resistance to the cleanup process and to improve cleanup outcomes for the community, the legislation proposes increased community involvement in all stages of the cleanup process.

RESEARCH APPROACH

To assess the potential effects of the proposed legislation on transaction costs, we draw on the quantitative findings of prior RAND research as well as on discussions with many Superfund participants conducted during that research. We have supplemented these data with additional telephone interviews with stakeholders in the Superfund Reform Act of 1994, including representatives of both large and small PRPs, insurers, reinsurers, the Environmental Protection Agency, the Department of the Treasury, environmental groups, and research organizations. Interviewees who were familiar with the reform act were asked their opinions of its strengths and weaknesses, with particular emphasis on the effect on transaction costs. The most important aspects of the act were described to interviewees who were unfamiliar with the proposal, and their reactions were solicited.

In the following analysis, we make no attempt to present the views of different stakeholders systematically. Rather, we use the reactions of the various stakeholders to inform the analysis and assessment.

Our discussion is organized around the five key interactions described in this chapter. In each chapter, we describe one or two interactions. Each interaction is among one set of key players. We discuss how the proposed legislation affects that interaction. We note features of the proposed legislation that may reduce transaction costs, as well as those that may allow existing transaction costs to
continue or that may create new sources of transaction costs, and then provide an overall evaluation of net effect.

In the final chapter of the report, we summarize the effect of the proposed legislation on the individual interactions and evaluate its likely overall effect on transaction costs.
Chapter Two

PRP-PRP INTERACTION

The interaction among PRPs is a major source of transaction costs at Superfund sites. These interactions have three dimensions: PRPs (1) allocate liability among themselves, (2) recover costs from non-participating PRPs, and (3) determine a joint strategy in negotiating with the government and in recovering costs from nonparticipating PRPs.

The significance of this source of transaction costs is suggested by the relationship between the number of PRPs at a site and transaction-cost share. RAND studies found a strong relationship between these variables (see Table 2.1).\(^1\) At single-PRP sites and sites with few

\(^1\) Although the shares reported in Table 2.1 do not hold constant other site characteristics, such as stage in the cleanup process, the relationship between transaction costs and the number of PRPs remains when other factors are held constant. See Acton and Dixon, 1992, p. 52, and Dixon, Drezner, and Hammit, 1993, p. 39.
Table 2.1
Transaction-Cost Share by Number of PRPs at the Site

<table>
<thead>
<tr>
<th>Type of Sites and Number of PRPs</th>
<th>Transaction-Cost Share (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992 Study (1984–1989)(^a)</td>
<td></td>
</tr>
<tr>
<td>Single-PRP sites</td>
<td>5</td>
</tr>
<tr>
<td>Multiple-PRP sites</td>
<td>24</td>
</tr>
<tr>
<td>1993 Study (1981–1991)(^b)</td>
<td></td>
</tr>
<tr>
<td>≤15 PRPs</td>
<td>14</td>
</tr>
<tr>
<td>16–100 PRPs</td>
<td>36</td>
</tr>
<tr>
<td>&gt;100 PRPs</td>
<td>34</td>
</tr>
</tbody>
</table>

\(^a\)Acton and Dixon, 1992, p. 48.
\(^b\)Estimated transaction-cost share for total PRP expenditures at 18 sites studied in Dixon, Drezen, and Hammitt, 1993.

PRPs, transaction-cost shares were relatively modest; at sites with more than 15 PRPs, they were markedly higher.\(^2\)

How will the Superfund Reform Act of 1994 affect PRP interaction?

**ALLOCATING LIABILITY AMONG PRPs**

In the current system, EPA generally leaves allocation decisions to the PRPs, and, frequently, allocation becomes a complex and contentious issue. EPA often names only a subset of the PRPs at the site and collects only partial information on the waste sent to the site. PRPs named at the site may search for other PRPs and conduct extensive studies to determine who sent what to the site. On the basis of this information, PRPs attempt to allocate liability among themselves.

The allocation process lends itself to contention. There are two reasons why contentiousness can pay off. First, data on who sent what to a site are frequently incomplete and often nonexistent. Frequently

\(^2\)These results also likely reflect an increase in PRP-government transaction costs as the number of PRPs rises.
PRPs must rely on conflicting oral testimony of truckers, site operators, and generators to reconstruct waste deliveries to the site. The lack of solid information allows potentially wide variation in final outcomes. Second, because there is no standardized allocation method, the process is a complex one in which vigorous lobbying for a particular allocation method may significantly affect the outcome. For example, PRPs who sent high-volume but low-toxicity waste might argue that toxicity, not volume, should be most important in allocating cost shares among PRPs. PRPs who sent low-volume but high-toxicity waste might argue the opposite.

Allocation issues are particularly contentious when a municipality is involved. Even when other site characteristics, such as expected site cleanup costs and the number of PRPs, are controlled for, we found that transaction costs are higher at sites with municipal involvement (Dixon, Drezner, and Hammitt, 1993, p. 36). Municipal waste often accounts for a large share of the volume of waste at a site but for only a small proportion of the hazardous substances. As might be expected, municipalities have fought volume-based allocations. They have also asserted that the waste they generate should not be considered hazardous under CERCLA.

Given the lack of a standardized allocation process and the conflicting goals of the players, PRPs regularly incur substantial costs determining allocation; often they can agree only on interim allocations that must be revisited again and again.

The Proposed Legislation

Under the proposed legislation, PRPs will no longer be responsible for determining the allocation. Instead, a neutral allocator will attempt to negotiate an allocation with the PRPs; if that fails, the allocator will issue a nonbinding allocation (U.S. House, H.R. 3800, 1994, pp. 90–94; all further references to the proposed legislation will be cited by page number only). The proposal puts a hold on cost-recovery litigation between PRPs until 60 days after the allocator issues a report (p. 88). The proposal directs the allocator to base the allocation on a number of factors, including
• volume of waste sent to the site
• toxicity
• the degree of care exercised in handling the substance
• the degree of involvement in generating, handling, and disposing of the substance
• cooperation in providing complete information and contributing to the cleanup activity (pp. 94–95).

Shares for identified parties that are nonviable or cannot be located will be assigned to EPA as part of the orphan share, but waste that cannot be attributed to an individual party will be distributed among all the identified parties (pp. 95–96).

A number of PRPs would also be released from the allocation process. *De micromis* PRPs would be released from liability altogether and thus would not have to participate in the allocation process. *De micromis* PRPs are defined as parties that contributed less than 10 pounds or liters of materials containing hazardous substances or less than 500 pounds of municipal waste (p. 55). The cleanup cost attributable to the *de micromis* PRPs would be distributed among the remaining PRPs. *De minimis* PRPs, municipal generators and transporters, and municipal owners and operators and small businesses with limited ability to pay would also not have to participate in the allocation process if they accepted expedited settlements (discussed in Chapter Three) (p. 93). *De minimis* parties are defined in the legislation as PRPs that sent less than 1 percent of the waste to the site (p. 80).

The allocation process would start with an EPA search for PRPs. The PRPs so identified would then pick an allocator from a list of neutral allocators assembled by EPA. EPA would accept settlement based on the allocation, and nonsettlers may be held liable for the orphan share (pp. 97–101).

The neutral allocator's allocation would not be binding on the PRPs or on EPA. However, EPA could reject it only in limited circumstances: The Administrator, in concurrence with the Attorney Gen-
eral, must determine that the allocation is not fair, reasonable, and in the public interest.\(^3\)

**Strengths**

Taking responsibility for allocation away from an often-contentious group of PRPs and putting it in the hands of a neutral allocator seems to be a more efficient division of tasks. First, the allocators would presumably develop considerable expertise in allocating liability that PRPs do not have. Second, the allocators’ ability to use the government’s information-gathering authority would involve a less costly process than the full court discovery process PRPs must use as a final resort when they do the allocation themselves.

The proposed legislation attempts to check the complexity and number of parties involved in the allocation. The nonbinding allocation proposed should not require a cumbersome, formal process. Releasing from the allocation process the *de micromis* PRPs and PRPs who have entered into expedited settlements should limit the number of parties involved.

Finally, the proposed legislation appears to increase the incentives for PRPs to cooperate with the allocation process. When setting the allocation, the allocator can consider how cooperative a PRP has been, so cooperation has a direct payoff. In addition, moving to *de facto* proportional liability reduces the potential liability that a PRP faces when it decides to participate in the process. Municipalities, in particular, have less incentive to contest their allocations since municipal liability is limited to 10 percent of overall site costs. The threat of paying the orphan share also provides a disincentive to challenge settlements based on the allocation. The proposed legislation is arguably more fair in that PRPs may no longer have to pay the shares of other identified PRPs at the site. As a result, PRPs would probably be less successful in using the allocation issue to appeal to Congress and the public for changes in the Superfund program.

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\(^3\)The Administration proposal does not specify what happens if EPA does reject the allocation. Subsequent modifications to the proposal provide that the allocation would be redone with a new allocator.
Weaknesses

The proposed legislation has three principal drawbacks.

First, the way in which the allocator should assign liability is vague and complex. Volumetric share is listed as a factor, but it does not help in assigning wastes to site owners and operators, because owners and operators often do not send waste to a site. Toxicity is a factor, but there is no guidance about how to compare municipal waste, which has high volume and low toxicity, with industrial waste. The degree of care exercised in handling the hazardous substances and the cooperation in providing complete information and contributing to the cleanup activity are also factors, but using them to adjust shares is inherently subjective. Such imprecision is likely to cause contention and delay, and to incur attendant transaction costs.

A second disadvantage is that issuance of the allocator's report may not end all contention over allocation. Parties may refuse to settle with EPA based on the allocation and then challenge the allocation in court, which would generate transaction costs between the PRP and the government.

Finally, EPA's transaction costs may increase because of its greater information-gathering and administrative role during the allocation process and because PRPs may challenge allocations during the cost-recovery process.

Evaluation

Several issues arise in determining how these strengths and weaknesses might balance out. Assigning responsibility for allocation to a neutral third party rather than to the PRPs themselves seems like a more effective division of tasks, but its success depends critically on whether the allocator is considered impartial. Impartiality is obviously important to the PRPs, but it is also important to EPA, which is responsible for the orphan share. The proposed legislation handles this issue nicely by assigning EPA the task of developing a list of possible allocators but allowing the PRPs to choose from that list. It remains important, however, that EPA carefully consider what qualifications it should require of an allocator.
The nonbinding aspect of the allocation scheme, while attempting to minimize burdensome procedural requirements, has been the focus of considerable debate during the reauthorization process. Some PRPs are concerned that a nonbinding process would be ineffectual, thus wasting time and causing the allocations to be revisited.\footnote{See CMA, 1993, for a detailed discussion of the advantages of binding over nonbinding allocations.} This certainly is the case in other settings where a party can simply walk away from a decision it does not like. However, under the proposed legislation, a PRP's decision to accept the nonbinding allocation would be uncoupled from the decisions made by the other PRPs. A PRP could settle with EPA on the basis of its allocation regardless of whether other PRPs challenged their allocations.

As noted above, the nonbinding allocation procedure does run the risk of pushing transaction costs from the proposed allocation process to the cost-recovery process. However, it seems unlikely this would be an effective PRP strategy. The allocator's report, although not admissible in court for determining liability, could be used to help the court make an allocation among nonsettling parties (p. 83). Except in the case of an absurd allocation, nonsettlers may find it difficult to convince the court that another allocation is more appropriate.

Releasing \textit{de micromis} parties and parties offered expedited settlements from the allocation process should help keep transaction costs down, but it is uncertain how effective these provisions would be. The definition of \textit{de micromis} parties is very strict, and it is not known how successful an expedited settlement program would be.\footnote{Subsequent versions of the legislation have relaxed the \textit{de micromis} qualifications, and there has been a more detailed specification of the process for expedited settlements. Changes such as these may significantly change the number of parties involved in the allocation process.} What is more, even if many parties are released from the formal allocation process, they would still presumably have to provide information to EPA about their contributions to the site so that EPA can determine settlement offers or excuse them from liability. Thus, these parties would continue to incur transaction costs.
It is also not certain whether the number of repeated interim allocations under the current system would be substantially reduced by the proposed allocation process. At sites with multiple operable units, there may be pressure to develop a separate allocation for each.\(^6\) For example, a PRP may argue that its hazardous substances are present only in the soil, but not in the groundwater, and, consequently, that it should not have to pay for the groundwater operable unit. Also, the remedial investigation and feasibility studies for the operable units at a site can be quite far apart in time. PRPs may argue that this information must be available before a sitewide allocation can proceed. The result may be a situation where allocation issues are readdressed just as many times as they are under the current program.\(^7\)

Given all these uncertainties, it is difficult to predict whether the proposed legislation would reduce PRP-PRP transaction costs over allocation. It is likely that PRPs would spend substantial resources participating in the process, vague allocation criteria may generate contention, and there may still be repeated allocation at the same site. In spite of these drawbacks, it seems that the proposed allocation process would be an improvement over the current system. Even if the process is repeated at different operable units, there may still be some sense of finality; even though the allocation criteria are subjective, there may still be some sense of rough justice and, hence, acceptance.

A decrease in PRP-PRP transaction costs may come partly at the cost of increased PRP-government transaction costs over allocation. EPA would have greater information-gathering and administrative responsibilities during allocation than it does currently, and challenges to the allocation during cost recovery from nonsettlers may also generate EPA transaction costs.

\(^6\)Operable units designate particular areas at a site or particular media (such as soil or groundwater). EPA frequently divides a site into multiple operable units to be cleaned up separately.

\(^7\)The repetition issue too has been addressed by amendments proposed to the legislation. One amendment specifies that the allocation shall apply to all operable units at a site, but the allocator retains authority to address only one operable unit at a time.
RECOVERING COSTS FROM NONPARTICIPATING PRPs

The second major type of interaction among PRPs is cost recovery. In the existing Superfund program, EPA frequently settles with a subset of PRPs at a site to do or pay for the cleanup. The participating PRPs may then seek to recover costs from the nonparticipants. In deciding whether to pursue the nonparticipants, PRPs presumably weigh the legal and other associated costs of cost recovery with the magnitude of likely recoveries. In some cases PRPs also appear to incorporate political considerations into their decisions to pursue certain PRPs. For example, some PRPs we interviewed said they sometimes pursued the very small contributors to generate political pressure to change the law.

It is likely that cost-recovery cases generate significant transaction costs between PRPs. The cases can often be complicated by nonsettlers countersuing settlers over allocation when approached for cost recovery. As the number of cleanups under way increases, the number of cost-recovery cases will undoubtedly increase if the current program remains in place.

The Proposed Legislation

Under the Administration proposal, PRPs who settle with EPA on the basis of the allocation waive the right to recover costs from any other PRP at the site in return for receiving a release from further liability to any party (p. 80). EPA would then be responsible for collecting costs from the nonsettlers (p. 82). EPA would have to pay for any cleanup costs it is unable to collect from the nonsettlers, but it would be able to levy a premium on the settlers to compensate for this risk (p. 81). This settlement premium would increase the settlement cost above a PRP’s allocated base.

Strengths

Getting PRPs out of the cost-recovery business will reduce transaction costs generated by disputes over cost recovery among PRPs.

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8A PRP’s base is its percent liability allocation multiplied by the cost of cleanup.
Even though part of these costs would be transferred to EPA, EPA is arguably better suited to do cost recovery because it can issue administrative orders and collect hefty penalties for noncompliance.

The legislation should also lower PRPs' incentives to contest settlement. First, the amounts at stake in settlement negotiations would be lower because PRPs will no longer have to factor into their decision the cost and likely recoveries of pursuing the nonparticipants. Second, releasing *de minimis* parties from liability altogether and releasing settling parties from further liability should largely eliminate the tactic of pursuing politically sympathetic PRPs.

**Weaknesses**

Although EPA is better suited than the PRPs to pursue nonsettlers, assigning the agency this role has potential drawbacks. First, the difficulty and cost of recovery actions may tempt EPA to demand high settlement premiums, thus potentially discouraging PRPs from settling as well as blunting EPA's incentives to recover costs. Second, EPA's past record on cost recovery is spotty. Several PRPs we interviewed commented on how long it takes EPA to initiate cost recovery and noted that the recovery rate has not been high.9

High settlement premiums and failure to recover costs may reduce incentives for PRPs to settle. They would not directly affect the PRP-PRP transaction costs generated by cost recovery, but they may adversely affect the workings of the overall system.

**Evaluation**

The proposed legislation would clearly reduce PRP-PRP transaction costs over cost recovery, and it seems sensible to assign cost recovery to EPA, even if doing so increases EPA transaction costs. EPA's in-

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9Very rough calculations suggest that EPA may currently recover 25 to 30 percent of cleanup costs. In FY92 and FY93, EPA cost recoveries averaged about $185 million, but EPA costs on remedial investigation and feasibility studies, remedial designs, and remedial action averaged $780 million (EPA, 1993a, pp. IV-1, IV-2). The $185 million is 26 percent of $780 million once remedial action has been reduced by 10 percent to account for EPA funding for orphan sites. Data collected by Resources for the Future suggest that about 10 percent of NPL sites are orphan (Probst, Stone, and Terry, 1993).
centives to increase settlement premiums are reason for concern. Subsequent amendments to the proposed legislation have set limits on the premiums EPA can charge, and these limits should be carefully considered. Effective EPA cost recovery is also important, and adequate resources and incentives should also be provided to EPA for handling this responsibility.

DETERMINING A JOINT STRATEGY

The third important type of interaction among PRPs is determining a joint negotiating strategy. Under the existing program, EPA usually tries to negotiate with a PRP committee at a site rather than with individual PRPs; as a consequence, PRPs must develop common strategies for negotiating site investigations, remedies, and settlements. In addition, to the extent that PRPs attempt to jointly recover costs from nonparticipants, they incur costs in coordinating their actions.

Because PRPs at a site are usually heterogeneous, they often find it difficult to agree on a joint negotiating strategy. Variation in volumetric share is one principal difference across PRPs. Frequently, a large proportion of the parties at a site accounts for only a small share of the waste. As shown in Table 2.2, we found that 95 percent of PRPs at 18 study sites had volumetric shares less than 1 percent. What is more, while these *de minimis* and *de micromis* parties paid a relatively small amount of the cleanup costs at a site, they paid a

<table>
<thead>
<tr>
<th>Table 2.2</th>
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</thead>
<tbody>
<tr>
<td><strong>Expenditures Through 1991 of PRPs with Volumetric Share Less Than 1 Percent at 18 NPL Sites</strong></td>
</tr>
<tr>
<td>Percentage</td>
</tr>
<tr>
<td>Share of total PRPs</td>
</tr>
<tr>
<td>Transaction-cost share</td>
</tr>
<tr>
<td>Share of total transaction costs</td>
</tr>
<tr>
<td>Share of total cleanup costs</td>
</tr>
</tbody>
</table>

*Based on total predicted expenditures at the sites studied in Dixon, Drezner, and Hammitt, 1993.

*There were 3,650 PRPs at the 18 sites.*
much larger share of the transaction costs—probably because they still must participate in the negotiation process among PRPs and with the government and may still face cost-recovery suits from settling PRPs.

PRP characteristics affect what issues individual PRPs care about. For example, small-volume parties may be less concerned about the remedy because there may not be an important absolute difference between a small share of possibly quite different total remedy costs. In contrast, cleanup standards and remedies may have a major effect on costs paid by the large-volume parties. Big firms may be more concerned about public image than small firms and thus are more flexible during settlement negotiations.

Insurance coverage also probably influences PRP decisions. PRPs whose insurers have agreed to cover their costs may push for a quick settlement, whereas those with no insurance coverage may determine that the costs of rejecting a settlement are less than the costs of the settlement.

These differences make it difficult for PRPs to maintain stable coalitions at a site. Groups of PRPs often retain common counsel for negotiations with the government, but, in many cases, individual PRPs retain their own counsel to make sure their interests are well represented in the group. Often separate coalitions representing different interests develop. For example, de minimis PRPs at a site frequently form their own committee and negotiate separate settlements with EPA. Such agreements generate considerable contention: 23 percent of the 72 de minimis settlements EPA analyzed through September 1993 were contested by the larger-volume PRPs (EPA, 1993c, p. 21).

The Proposed Legislation

Under the Administration proposal, all PRPs would be able to settle individually with EPA on the basis of their allocated share (p. 80). This contrasts with the current system, whereby EPA generally offers individual settlements only to small-volume parties. The proposed legislation envisions that PRPs would still do the majority of actual cleanup work and that EPA would continue to negotiate work agreements with PRPs. In return for agreeing to do the cleanup, a PRP might have its allocation reduced (p.78). As discussed above, the
proposed legislation releases *de micromis* parties from liability, and EPA, not the PRPs, would be responsible for cost recovery from non-settlers.

**Strengths**

The proposed legislation would reduce the complexity of PRP-PRP interactions in determining a joint strategy. PRPs would negotiate directly with EPA without the mediation of a PRP committee, thus reducing the need for PRP coordination and the resulting transaction costs. By transferring responsibility for cost recovery to EPA, the legislation removes the need for PRPs to develop joint positions on cost recovery.

The legislation would also reduce incentives for conflict among PRPs. Since settlement will be based on allocated share, the settlement terms for one PRP should be largely a matter of indifference to other PRPs.

For those PRPs who negotiate as a group with EPA to do a cleanup, determining a joint negotiating position may be simpler for several reasons. First, the PRP group will probably be more homogeneous since it would likely include only the larger-volume parties. Second, the proposed allocation process should eliminate internal conflicts over liability share.

**Weaknesses**

EPA would still have to negotiate with groups of PRPs to do work at the site, and there still may be significant divisions and contention among the PRPs over negotiating strategy. For example, firms of different sizes may place different values on how the negotiation process affects their public image, and EPA may have to juggle competing PRP coalitions.

An additional concern is that reductions in transaction costs among PRPs may come at the cost of increased PRP-government transaction costs for individual settlements. Instead of negotiating a few major agreements with groups of PRPs, EPA would negotiate many individual settlements.
Evaluation

The proposed legislation clearly reduces transaction costs among PRPs that stem from developing a common negotiating strategy. PRP groups would no longer be required to do many of the things they do under the current system. This decrease in the complexity of the PRP-PRP interaction would be complemented by reduced PRP incentives to contest EPA settlements with other PRPs.

Some of the reductions in PRP-PRP transaction costs will undoubtedly be transferred to the PRP-government interaction. Whether there will be a net reduction in transaction costs depends on how well the new settlement process works, a topic to which we turn our attention in the next chapter.
The interaction between PRPs and the government generates transaction costs during the cleanup process. There are two major sources of transaction costs in this interaction: (1) disputes over cleanup standards and remedy selection, and (2) settlement negotiations. Since the focus here is on transaction costs, the discussion on cleanup standards and remedy selection focuses on the process for selecting remedies and cleanup costs, not on the benefits of the cleanups for human health and the environment. The discussion on settlement negotiations focuses on settlement issues separate from disputes over remedy.

We do not know what proportion of overall transaction costs generated by the existing program arises from PRP-government interactions, but there is indirect evidence that the share is significant. First, the contention over cleanup standards and remedy selection and their likely indirect effects on the entire settlement process is reflected in the relation between expected site cleanup costs and transaction costs shown in Table 3.1. RAND research has shown that
Table 3.1
Relationship Between Transaction Costs Through 1991
and Expected Site Cleanup Costs at 18 NPL Sites^a

<table>
<thead>
<tr>
<th>Expected Cleanup Cost ($ millions)</th>
<th>Transaction Costs ($ thousands per site)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;20</td>
<td>508</td>
</tr>
<tr>
<td>20-75</td>
<td>1,570</td>
</tr>
<tr>
<td>&gt;75</td>
<td>3,085</td>
</tr>
</tbody>
</table>

^aProjected transaction costs of all PRPs at sites studied in Dixon, Drezner, and Hammitt, 1993.

Transaction costs are higher at sites with higher expected cleanup costs.1

Second, EPA spends a sizable portion of its budget on enforcement and settlement negotiations. Approximately 13 percent of the $1.6 billion FY93 Superfund appropriation was for enforcement. An additional 11 percent was for response support, a significant proportion of which was probably spent in searches for and negotiations with PRPs (EPA, 1993a, p. IV-2).

Third, the slow pace of the program and often drawn-out negotiations suggest that disputes over remedy selection and settlement terms are significant.

CLEANUP STANDARDS AND REMEDY SELECTION

Determining cleanup standards under the current system is both confusing and time-consuming. Remedies at Superfund sites must comply with “applicable” or “relevant and appropriate” requirements (ARARs) of both federal and state environmental laws. ARARs are not explicitly identified in the existing statute, and there is a great deal of debate between PRPs and state and federal officials over what qualifies as an ARAR. When ARARs do not exist, as is usually the case for soil contamination, a site-specific, risk-based determination of

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1Other site characteristics, such as current cleanup phase, are not held constant in Table 3.1, but the relationship remains after other factors are controlled for (see Dixon, Drezner, and Hammitt, 1993, p. 36).
cleanup standards is used under the current system (EPA, 1994, p. 18).

Selecting cleanup standards and remedies is also complicated by the overlapping authority of the state and federal governments at Super- fund sites. These entities frequently disagree over both cleanup standards and remedy selection, creating confusion among PRPs, delaying the cleanup process, and generating transaction costs (EPA, 1994, p. 4).

Cleanup standards and choice of remedy can significantly affect the remedial costs at a site, and the debate over cleanup standards and remedies may be fierce, whether there are few or many PRPs at the site.\(^2\) PRPs often consider cleanup standards and remedy selection the most contention-producing issues in the cleanup process.

When deciding to contest cleanup standards or remedies, PRPs presumably weigh the legal and other costs of contesting cleanup standards and remedies against the expected effect of contesting these issues on the ultimate cleanup costs.\(^3\) PRPs often argue that cleanup standards and remedies at Superfund sites are far more stringent than they would be outside of the Superfund context and that the risks posed by the sites do not warrant the high costs (Reilly, 1993). PRPs will presumably continue to contest expensive remedies to the extent that they think they can convince the public, Congress, or regulators that expensive remedies offer little benefit over cheaper ones.

EPA's incentives are quite different from those of the PRPs. Both ARARs and the preference for treatment and permanence in the existing statute cause EPA to push for the more expensive remedies. However, EPA is also under pressure to accelerate the cleanup process; to expedite cleanup, it may be willing to compromise.

\(^2\)Studies at the University of Tennessee show cleanup costs varying by a factor of 4, depending on whether more stringent or less stringent cleanup standards and remedies are used (Russell, Colglazier, and English, 1991).

\(^3\)This does not mean that PRPs will always prefer cheaper (in the short run) containment remedies to treatment remedies. Containment remedies may fail, causing higher costs than treatment remedies in the long run.
The Proposed Legislation

The proposed legislation attempts to address many of the issues that generate contention in setting standards and selecting remedies.

The legislation provides some restrictions on what state cleanup standards would apply to Superfund cleanups. State standards that are stricter than federal standards would apply only if they specifically relate to remedial action (p. 106). These restrictions should exclude most of the narrative language on nondegradation of the environment that characterizes many ARARs. Under the proposed legislation, a state may still pick a cleanup standard stricter than is warranted by the applicable state and federal laws, but the state would have to pay the incremental costs of the stricter standard—and cannot pass those costs on to either the federal government or to the PRPs (p. 31).

The proposed legislation directs EPA to develop national cleanup standards that would vary according to readily quantifiable site characteristics and planned future land use (pp. 104–105). EPA would also develop generic remedies for different types of sites. Then, for sites with particular characteristics, EPA could select a generic remedy without considering other alternatives (p. 113).

The legislation provides for greater flexibility in choosing remedies. There would no longer be a preference for treating all waste at a site; rather, remedy selection would emphasize “long-term reliability,” which would put less costly containment remedies on the same footing as treatment remedies in the remedy-selection process (p. 90). Cost could also be considered when choosing among remedies. There would still be a preference for treating hot spots at the site. Hot spots are defined as discrete areas containing hazardous substances that are highly toxic or highly mobile, cannot be reliably contained, and present a significant risk to human health or the environment (p. 112).

The legislation proposes to clarify the relation between federal and state governments by assigning responsibility to only one government agency at each site. States would be given the opportunity to assume authority for cleanup of specific sites (pp. 27–29). Although EPA approval of the remedy at a state-run site is not required, EPA would be given the opportunity to review the remedy. If the state
does not respond to EPA's request for modifications to the remedy, EPA may withdraw federal money for cleanup in the state or rescind the state's authorization to run the cleanups (p. 33).

Finally, the proposed legislation exempts on-site cleanup activities from federal and state procedural requirements for handling hazardous substances (p. 107). This exemption is aimed at circumventing often-costly Resource Conservation and Recovery Act (RCRA) requirements sometimes placed on Superfund cleanups. RCRA sets standards for treating, storing, and disposing of hazardous substances and was enacted mainly to regulate newly generated waste streams.

Strengths

Several features of the proposed legislation may simplify the standard-setting and remedy-selection process. First, restrictions on the type of state standards that apply may make determining cleanup standards more straightforward. Second, national standards may reduce the need for a detailed risk assessment at every site, thus presumably reducing both the resources spent in setting standards and the accompanying transaction costs. Third, generic remedies may enable EPA and the PRPs to forgo detailed consideration of a large number of remedies at each site. Finally, the more complete delegation of sites to states may end the problem of multiple "masters" at Superfund sites.

Standardizing standard setting and remedy selection through creation of national standards and generic remedies may make the cleanup process simpler. But standardization may also have a more profound effect: It may reduce a PRP's incentives to fight over remedies, because a standardized process may simply leave less room for negotiation.

The proposed legislation may also reduce the incentives of PRPs to contest cleanups by decreasing pressure on EPA to push for the expensive cleanup options that PRPs resist. Under current law,
cleanup standards are usually based on the future land use with the most restrictive health requirements (i.e., residential). Incorporating expected future land use into standard setting would presumably result in proposals for less stringent standards in some cases and remove or reduce an issue of contention. No longer insisting on treatment for the whole site would also reduce conflict at some sites, as would requiring states to pay the incremental costs of cleanups that are not required by applicable state and federal laws.

Finally, by exempting on-site cleanups from expensive RCRA requirements, the proposed legislation should also reduce an important source of contention between PRPs and the government.

The proposed legislation removes several features of the law, such as the preference for treatment and the setting of cleanup standards to satisfy all possible future land uses, that PRPs often have been able to characterize successfully as unreasonable. This change should reduce PRP expectations that further arguments about cleanups' being too expensive will receive a sympathetic hearing from the public, Congress, or regulators.

Weaknesses

Despite provisions for standardization and less insistence on the most costly remedies, there would still be a large number of issues to be resolved in the standard-setting and remedy-selection process. Therefore, not only may determining standards and selecting remedies remain complex, but they may also provide instances where PRP intervention substantially affects cleanup costs. Future land use will have to be decided, which could cause significant changes in cleanup cost. As discussed below, land-use decisions would involve the local community and could be quite contentious. The definition of hot spots in the proposed legislation is open to interpretation and may also be an important source of contention. Costs are to be considered in choosing remedies, but the legislation provides only very general guidance about how they should be considered. Which state standards will be considered applicable to the cleanup is also not specified and may be hotly debated.

Developing national standards and generic remedies itself may also generate considerable transaction costs. Which national standards
and generic remedies were accepted would certainly drive cleanup costs and thus invite conflict between PRPs and EPA. It may take a long time to develop the standards and remedies, and the uncertainty of what cleanup standards to use in the interim could possibly induce even more contention between PRPs and the government than there is now.

Even after national standards and generic remedies have been promulgated, EPA would still have the option of conducting site-specific risk assessments and investigations to determine cleanup standards and remedies when site characteristics warrant them. Determining when site-specific assessments are appropriate may be another source of contention between PRPs and the government.

Some features of the legislation could increase pressure for expensive remedies and, hence, transaction costs. EPA may be under intense pressure to adopt very conservative national standards.\(^5\) Hot spots could be so broadly defined that there would be little change from the preference for treatment in the current statute. States may rewrite their laws to qualify as applicable requirements under the proposed legislation. Increased community involvement in cleanup decisions could increase pressure for expensive remedies, because communities may not have the incentives to appropriately weigh costs and benefits.

**Evaluation**

The proposed legislation takes positive steps to simplify and standardize the standard-setting and remedy-selection process. These changes would tend to reduce transaction costs; however, a large number of potentially contentious issues would remain at many sites. The process may become simpler once national standards and generic remedies are in routine use, but such use may not occur for many years.

The proposed legislation also takes positive steps to relax the strict requirements that lead EPA to push for very expensive remedies at

\(^5\)As an illustration, amendments have already been adopted by one House subcommittee that would require very strict standards for groundwater cleanups.
many sites, which may reduce PRPs' incentives to fight or delay settling. But, again, the overall effect of the legislation is ambiguous. If national standards turn out to be very strict or hot spots to be broadly defined, for example, remedies may remain quite expensive, giving PRPs increased incentives to delay or actively contest the remedy. Such features in the proposed legislation may also maintain the gap between proposed cleanup costs and what the PRPs think they can convince the public, Congress, or regulators is reasonable.

Because of these conflicting factors, the legislation's overall effect on the transaction costs generated in standard setting and remedy selection remains uncertain.

SETTLEMENT NEGOTIATIONS

Even given agreement on cleanup standards and remedies, settlement negotiations between PRPs and the government can be time-consuming and contentious. Joint and several liability can make the stakes for the participating PRPs very high, particularly since there is great uncertainty over the likely success of recovering costs from nonparticipating PRPs. PRPs have challenged joint and several liability in the courts and have generally lost, but they may continue to resist settlement, hoping to appeal to the political process.

PRPs also resist settling in many cases because the current settlements often fail to limit ultimate liability. In all but extraordinary circumstances, the current statute requires EPA to include provisions to reopen the settlement agreement if a remedy fails and costs are overrun (Clay, 1993, p. 33). Faced with this uncertainty, PRPs may determine that it is less costly to delay settlement or to become a nonparticipant than to settle.

Divisions among PRPs also complicate the settlement process. As noted above, large-volume PRPs have contested a sizable percent of de minimis settlement negotiated by EPA through 1993, and PRPs have also opposed EPA efforts to settle with municipalities on relatively favorable terms (The Information Network for Superfund Settlements, 1993, pp. 36–69). This opposition arises because the remaining PRPs at the site are liable for the residual cleanup costs.
The settlement process is further complicated by the overlapping authorities of several government agencies at the site. The judicial system is also involved—for example, consent decrees between PRPs and the government for cleanup work at a site must be entered in court.

Finally, a new set of environmental issues is emerging that may introduce new complexities and new sources of contention. Natural resource damages do not appear to have been a major concern at most Superfund sites so far, but there is growing concern that they will become a significant source of contention between PRPs and the government in settlement negotiations (The Business Roundtable, 1993, p. 7). Cost-recovery guidelines for natural resource damages have been under development for many years, and their impending finalization may provide an important stimulus for such claims. The concepts and methodologies proposed to determine damages have been vigorously contested by PRPs in many settings. Natural resource damages bring yet another set of actors into the settlement process, and, so far, the natural resource trustees have not coordinated their actions well with EPA.

The Proposed Legislation

The proposed legislation fundamentally changes the settlement process for both large- and small-volume parties. EPA would be required to offer settlements to all PRPs, regardless of volume, on the basis of their allocated shares. PRPs would be required to pay an EPA-determined premium to cover risks of remedy failure, unknown conditions at the site, cost overruns, and failure to recover costs from nonsettlers; in return, however, the settlements would be final (pp. 97–100). Settlements would include a pledge by the government not to sue for additional costs and protection from cost recovery by other PRPs; settlers would agree not to attempt to recover costs from any other PRP at the site. As an incentive to settle, nonsettlers would be

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6Natural resource damages are damages to the ecosystem on and around a site. They are in addition to the costs of actually treating or containing the waste at a site.

7Both the National Oceanic and Atmospheric Administration and the Department of the Interior are developing guidelines.
held liable for the orphan share, as well as for their allocated share (pp. 100–101).

Under the proposed legislation, EPA could continue to use its existing enforcement authorities to require certain PRPs to conduct the cleanup as part of the settlement terms. EPA would reimburse PRPs that performed the cleanup for any cleanup cost in excess of their allocated share and negotiated premiums, and the reimbursements would not be contingent on EPA’s recovering costs from the nonsettlers (p. 100). EPA may reduce the risk premium for these work-group PRPs because they are, in part, bearing the risks of cost overruns and cost failures, and work-group PRPs would also benefit if they could do the cleanup more cheaply than estimated by EPA.

The proposed legislation offers special treatment to certain parties. First, municipal generators and transporters would have to pay no more than 10 percent of the total cleanup costs at the facility, regardless of the municipal share assigned in the allocation process. EPA would also pick up the difference as part of the orphan share (p. 81). Second, discounts from the allocated share would be offered to municipal owners and operators and to small businesses with limited ability to pay (pp. 81–82). EPA would also pick up the difference between the settlement amount and the allocated share (pp. 95–96). De micromis parties would be released from liability altogether, and EPA would offer settlements “as promptly as possible” to other parties that contributed less than 1 percent of the waste at the site (pp. 79–80). EPA would also offer expedited settlements to municipal generators and transporters, municipal owners and operators, and small businesses with limited ability to pay. To ensure greater use of such expedited settlements, EPA would be required to explain in writing why it rejected a request for an expedited settlement (p. 84).

Strengths

Settlements conditions appear to be far more attractive to PRPs under the proposed legislation, thus reducing the perceived gains of contesting settlement:

- PRPs would be liable only for the share of waste they sent to the site and the pro-rata share of the waste sent by PRPs that could not be identified.
• EPA’s funding of the orphan share could reduce PRP costs by 10 to 15 percent.\(^8\)

• By paying a premium, PRPs will be able to obtain a full release from liability. EPA, and not the settling PRP, would then bear the risk of remedy failures, cost overruns, and undiscovered wastes at the site.\(^9\)

• Subsidized settlements for PRPs who can demonstrate a limited ability to pay may encourage settlement from parties who would otherwise simply not be able to pay.

Because the difference between the settlement amount and the allocated share would be assigned to the orphan share, PRPs would no longer have an incentive to contest municipal settlements or favorable settlements with small businesses with limited ability to pay. And the threat of liability for the orphan share to nonsettlers creates further incentives to settle.

Finally, expedited settlements may remove \textit{de minimis} municipalities and PRPs with limited ability to pay before they incur disproportionate transaction costs (see Table 2.2).\(^{10}\)

\textbf{Weaknesses}

Some of the features of the legislation that make settlements more attractive to PRPs may increase EPA’s transaction costs. For example, EPA would be required to consider settlement offers from all PRPs, regardless of their share of the waste at the site. Determining

\(^{8}\)An EPA study on orphan shares implies an orphan share for nonviable parties of 12 percent (EPA, 1983b, pp. 5–7).

\(^{9}\)A subsequent amendment would not require EPA to offer final settlements when hazardous substances in excess of contamination levels set by national standards remain at the site. This amendment could limit releases at sites with containment remedies and reduce the attractiveness of settlement offers to PRPs.

\(^{10}\)It may be less important to settle out \textit{de minimis} PRPs early under the proposed legislation than under the current program. First, under the proposed legislation, there may be fewer issues small-volume PRPs must follow, and, thus, they may incur fewer transaction costs. Second, it may also be easier for EPA to offer such PRPs settlement later, when more information is available. Early settlement may be justified on other grounds, however. PRPs often cannot obtain bank financing until their Superfund liability is resolved.
which municipalities and small businesses really do have a limited ability to pay may also put a substantial burden on EPA, and it is a task with which EPA has little experience or expertise. The proposed legislation would release de minimis parties from liability, but EPA will still have to determine which PRPs meet the cutoff.

The difference between the settlement amount and the allocated share for de minimis PRPs is split between the remaining PRPs and the orphan share on a pro-rata basis. Favorable settlements with de minimis parties would thus adversely affect the remaining PRPs, particularly if the orphan share at the site is small. The proposed legislation prohibits PRPs from directly challenging de minimis settlements or suing de minimis settlers, but the resulting increase in liability could increase PRP incentives to contest other elements of the cleanup process more vigorously.

PRPs often assert that they can do cleanups much more cheaply than can EPA.\(^1\) It thus may be a more effective division of tasks for PRPs rather than the government to actually do cleanup, and EPA may simply not have the resources to do a larger number of cleanups itself. The cost of PRP-led remedies, however, is that EPA would still have to negotiate cleanup agreements with the PRPs. Although EPA can order PRPs to do the remedy, experience suggests that substantial transaction costs can be generated in drawn-out negotiations if PRPs are not cooperative.

A final weakness of the Administration proposal is that it does not address natural resource damages. PRPs may refuse to settle unless natural resource damage liability is resolved, but lack of coordination among trustees and EPA and contention over the size of the estimated damages may make such resolution difficult.

**Evaluation**

Settlement terms under the proposed legislation appear far more favorable to PRPs than those under the current system, and the move to de facto proportional liability removes an effective PRP critique of

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\(^1\)In its analyses, the Congressional Budget Office assumes that PRPs can do a cleanup 20 percent more cheaply than can EPA (CBO, 1994, p. 28).
the overall system—its unfairness. These changes may give PRPs strong incentives to cooperate in the settlement process, and the resulting reductions in transaction costs may outweigh the substantially increased settlement burdens on EPA.

Even with more attractive settlement terms, however, PRPs will still compare the costs and benefits of resisting settlement under the new regime. The answer to this cost calculus will depend in part on how the program is implemented. If EPA accepts only very high settlement premiums and ineffectually pursues nonsettlers, then contesting settlement becomes more attractive to PRPs. But if EPA sets premiums on the basis of some sense of real risk and actively pursues nonsettlers, it seems likely that the proposed settlement process will generate lower transaction costs than the current system.

Whether PRPs are willing to do the cleanups will affect the contentiousness of the settlement process. The PRPs' desire to undertake the cleanup will depend on the expected cleanup costs used in setting settlement offers and the settlement premiums. If EPA's estimated cleanup costs plus premiums are lower or just marginally above PRP estimates of the cleanup costs, then the PRPs may prefer to settle out. EPA should carefully consider how to adjust the premium for PRPs that agree to do cleanup.

Finally, natural resource damage claims are a potentially significant source of contention in Superfund settlements. The more favorable settlement terms in the proposed legislation would presumably apply to natural resource damages; however, a new set of participants that may not be well coordinated with EPA and the sizable damages that can be generated by the damage assessment methodology may result in significant transaction costs. Ways in which to integrate natural resource damage and cleanup programs may need to be addressed before the proposed legislation can be effective.
Insurers are the focal point of two types of interactions in the Superfund process. They receive claims from PRPs for coverage of costs at Superfund sites, and they turn to their own reinsurers for reimbursement of expenses. In this chapter, we consider each of these interactions.

PRP-INSURER INTERACTION

PRPs frequently turn to their insurers for reimbursement of legal and cleanup costs. These claims are typically brought under comprehensive general liability and commercial multi-peril policies, but the applicability of these policies is hotly contested. Insurers hold that the policies do not cover claims related to inactive hazardous waste sites. Since insurance contracts are subject to state law, the coverage issues must be separately resolved in all 50 states. Court decisions across states vary widely, leading to protracted disputes over venue. Even though insurers usually deny that PRP claims are covered, they
often must pay the legal costs of their policyholders until the issue is resolved in the courts (see Powell, 1992).\(^1\)

Our research suggests that the conflict between insurers and policyholders generates substantial transaction costs. We found that 42 percent of the expenditures through 1989 of four national insurers was on coverage disputes and an additional 9 percent was to process and investigate claims (Acton and Dixon, 1992, p. 24). The size of these percentages reflects the tremendous contention between PRPs and their insurers over coverage.

Insurers also make sizable payments either to or on behalf of PRPs. As shown in Figure 4.1, 37 percent of insurer expenditures went to defend their policyholders; 12 percent were indemnity payments, which are associated with cleanup.

Total insurance industry outlays on cleanup claims were estimated at approximately $370 million in 1989, 40 percent involving NPL sites. We found that total expenditures grew rapidly through 1989, so it is likely that annual outlays are substantially higher today (Acton and Dixon, 1992, pp. 11, 31).

In both our studies on transaction costs, PRP expenditures on insurance-coverage disputes were neither large nor a significant share of overall PRP transaction costs. Presumably, however, insurer expenditures on coverage disputes are mirrored, although perhaps incompletely, among policyholders.\(^2\)

The stakes for both insurers and PRPs in the coverage disputes are high. Because so many legal issues remain unresolved, both sides perceive that vigorously arguing their case may yield large returns.

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\(^1\)Interpretations of insurance contracts generally distinguish between an insurer’s policy coverage for substantive losses suffered by its policyholders and the added expenses incurred by those policyholders in defending litigation by third parties. In the latter case, courts have often found a “duty to defend” or, at least, a duty to cover such expenses even in cases where the substantive-coverage issue is in dispute. Failure by the insurer to recognize such a duty could lead not only to increased damage exposure, but also to possible “bad faith” claims.

\(^2\)Insurer expenditures on coverage disputes may be larger than PRP expenditures for two reasons. First, insurers may litigate more vigorously out of fear that the case may set a precedent for other claims. Second, PRPs often have policies with many insurers, so a decision to pursue coverage by one PRP may elicit a response from many insurers.
The Proposed Legislation

The insurance provisions in the Clinton Administration’s February 1994 proposal were the interim product of ongoing negotiations between PRPs and insurers. Insurers and policyholders continued to negotiate, and, in April 1994, a draft amendment based on these negotiations was released by Representative Al Swift (Swift, 1994; all page references in this subsection are to this draft amendment). This revision has served as the basis for subsequent debate and is the proposal evaluated here.

The proposed legislation imposes a stay on all litigation over insurance coverage at NPL sites and on coverage for removal actions and defense costs at non-NPL sites (p. 36). It sets up an Environmental

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3The language in the draft amendment was negotiated by the Coalition on Superfund, a group of insurance, manufacturing, environmental service, natural resource, and chemical companies.
Insurance Resolution Fund to resolve the claims. PRPs must seek settlement from the fund before they can resume or initiate coverage litigation. There is one significant exception to this prohibition, however: A PRP that has filed suit against its insurers could decide within 60 days of passage of the proposed legislation to reject any offer that the fund might make and continue pursuing its insurers (p. 28).

PRPs would be eligible for reimbursement from the fund if (1) they had comprehensive general liability or commercial multi-peril insurance coverage prior to January 1, 1986, and (2) they had filed a claim prior to January 1, 1994, and were actively pursuing a claim. The legislation lists the factors to be used by the fund in deciding whether a PRP has adequate proof of insurance. A variety of actions would qualify as actively pursuing a claim, from filing a lawsuit in 1993 to engaging in “active investigation and preparation of a claim before January 1, 1994.” The fund would have the authority to waive the second requirement if it chose to do so (pp. 15–16).

PRPs would be reimbursed for a percentage of the eligible costs they submit to the fund. At NPL sites, eligible costs would be expenditures on removal and remedial actions and legal costs related to hazardous substances disposed of prior to January 1, 1986. Remedial actions would not be covered at non-NPL sites. An eligible PRP could seek recovery for eligible costs incurred at a site up to its available coverage, which would be determined by adding the liability limits for all valid insurance contracts (p. 24).

Under the proposed legislation, the resolution fund would offer one reimbursement rate to each PRP for all its eligible costs at all sites, including sites at which the PRP is not currently involved but may be in the future. PRPs must either accept or reject the reimbursement rate for all sites (p. 13).

The resolution fund would offer 20, 40, or 60 percent of eligible costs, depending on the litigation venue that has been established for each

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4The resolution fund would be administered by a board of trustees appointed by the President and would consist of seven government and private-sector members. The government members would be the EPA Administrator and the U.S. Attorney General. At least two of the five private-sector members would represent insurers, and at least two would represent PRPs (p. 113).
site. On the basis of insurance coverage cases decided in each state by January 1, 1994, the proposed legislation sets the reimbursement rate at 20 percent in the 10 states where the state law is most favorable to insurers, 60 percent in the 10 states where the state law is most favorable to PRPs, and 40 percent in the remaining 30 states.\(^5\)

The reimbursement rate would be the average of these three percentages, weighted by site litigation venue and expected cleanup costs. The average deductible in a PRP’s policies would be deducted once from the initial payment (p. 30).

The fund would spread payments over a 10-year period for PRP costs incurred prior to the fund offer. Reimbursement for costs incurred after the offer, including costs for sites later added to the NPL, would be paid within 60 days of the date the PRP submitted the cost to the fund (pp. 29–30). PRPs that accept the fund’s offer would waive the right to pursue Superfund claims against their insurers (p. 29).

The legislation provides disincentives to PRPs to reject the fund’s offer and pursue their insurers in court. If the court’s final judgment is less favorable to the PRP than the resolution offered by the fund, the PRP would be liable for 50 percent of insurer costs and legal fees in connection with the case. However, the insurer would have to pursue these costs in a separate legal action (pp. 33–35).\(^6\)

The proposed legislation provides for a quick referendum to determine whether the majority of PRPs will accept the fund’s offers. Within 30 days after the legislation is enacted, insurers would be directed to provide the fund with a list of PRPs that had filed suit to recover Superfund costs (a subset of the PRPs that would qualify for reimbursement from the fund). Within 90 days of enactment, the fund would determine the reimbursement percentage for each of these PRPs, who would then have another 45 days to make a non-binding decision to accept or reject this percentage. If more than 15 percent of PRPs, weighted by number of sites, rejected the fund’s of-

\(^5\)Reimbursement rates are lower for “owned property sites.” Only 70 percent of the eligible costs at such sites would be applied to the reimbursement rate (p. 25). Insurers argue that liability coverage for waste disposed on property the PRP owns has less legal basis than coverage for waste sent to property owned by someone else.

\(^6\)PRP liability for insurer legal costs is controversial and has been eliminated in some subsequent versions of the proposed legislation.
fers, the fund would be abolished. Nonresponding PRPs would be considered as having accepted the offer (pp. 43–45).

Fund revenues would be raised by taxes on the insurance industry. The taxing mechanism is not specified in the proposed legislation, but a proposal by the Department of the Treasury calls for taxes and fees on both insurers and reinsurers totaling $2.5 billion over 5 years (Department of the Treasury, 1994).7

**Strengths**

The proposed legislation attempts to simplify the resolution of insurance claims by creating a mechanism for resolving them outside the legal system and by using a specified formula to determine settlements. The specified formula would presumably streamline and routinize the settlement process. The fund applies only to policies written before January 1, 1986, but clearly worded pollution exclusions rule out coverage litigation over policies written after that date.

The legislation also provides clear incentives to PRPs to accept fund offers. The costs of nonacceptance are increased by holding liable for insurer legal costs those PRPs who reject fund offers and pursue their insurers in court. Making only one offer to PRPs for all their sites may deter litigation, because PRPs would not be able to accept settlements at some sites and continue to pursue their insurers at others.

Finally the resolution fund may have two indirect benefits for the cleanup process. First, resolution of insurance issues may have the added benefit of speeding settlements with the government. PRPs we interviewed said that uncertainty over insurance coverage delays their settlement decisions. Second, PRPs that accept settlement offers will have only a portion of their legal costs covered, which may reduce litigation by those PRPs whose insurers cover all legal costs under the current system as opposed to only a portion.

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7The total has been raised substantially in subsequent legislation.
Weaknesses

The proposed legislation would not end coverage litigation. PRPs can still reject fund offers and continue to pursue their insurers in court. More important, the proposed legislation does not cover a number of situations, some of which may continue to generate substantial transaction costs. First, the fund does not cover cleanup costs at non-NPL sites. Although the sites on the NPL are among the most expensive in the nation to clean up, non-NPL sites far outnumber NPL sites. In our 1992 study, we found that 60 percent of the expenditures of the four national insurers and at least 40 percent of the expenditures reported by the five very large industrial firms were at non-NPL sites (Acton and Dixon, 1992, pp. 26, 48). Some of the industrial firms were unable to report expenditures at all their non-NPL sites. Therefore, expenditures at non-NPL sites may be somewhat higher than 40 percent of total expenditures. When PRPs pursue their insurers, they usually attempt to recover costs for both NPL and non-NPL sites, not just a subset. As a consequence, even if the fund is successful, there may be little reduction in the number of coverage cases filed, although perhaps the number of sites addressed in each case may be reduced.

Second, the fund need not make settlement offers to PRPs it determines were not actively pursuing claims prior to 1994. These PRPs would be free to sue their insurers—without being potentially liable for 50 percent of insurer transaction costs. These PRPs may have claims as strong as PRPs that were actively pursuing claims, but may have been waiting to proceed until insurance law was better settled or until they had completed negotiations with EPA. They would have no choice but to litigate with their insurers: Their situation would remain much the same as under the current policy.

The proposed legislation would also introduce new complexities and create new sources of transaction costs. First, the fund would have many time-consuming responsibilities—for example, determining whether a PRP is eligible for reimbursement, verifying litigation venue for each site, and establishing whether the site was an owned property site. Second, insurers wishing to recover legal costs from PRPs that pursued them in court and “lost” must initiate separate legal action.
Evaluation

Central to the success of the Environmental Insurance Resolution Fund is whether PRPs, after weighing the fund’s offer with the expected costs and benefits of pursuing their insurers in court, decide to accept the offer. Given the tremendous uncertainty over the legal interpretation of insurance contracts, as well as the variation in disposal practices across PRPs, the decision would be a very complex one.

The early referendum is a good idea, but it may not accurately indicate how well the fund would work. On the one hand, the conditions for passage may be too strict. Eighty-five percent is a large supermajority to start with; in addition, because the referendum is limited to PRPs that have already filed suits against their insurers, voting is limited to the PRPs that presumably have the stronger cases and thus may be more likely to vote against the fund. On the other hand, PRPs that do not vote are considered as having accepted the offers, and a high nonresponse rate may guarantee that the referendum passes, even if a large share of PRPs have no intention of accepting fund offers.

Given the stakes involved, it seems unlikely that PRPs would fail to vote in the referendum if they really had no intention of accepting fund offers: If the referendum passed, they would be liable for insurer legal costs. Consequently, passage may well indicate that a large fraction of PRPs would accept fund offers. Of greater concern is whether the conditions for passage are too strict. Who should vote (only PRPs that have filed suits against their insurers, PRPs that have filed insurance claims, or perhaps some larger set of PRPs?) and what majority should be required for passage (which will depend on how

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8 Even though the referendum is nonbinding, a PRP that does not intend to accept the fund’s offer has an incentive to vote no: If the fund passed, the PRP would be liable for its insurer’s legal costs.

9 Also note that if PRP liability for insurer legal costs is deleted from the bill, the referendum would be meaningless—PRPs would risk nothing if they voted for the fund, even though they had no intention of accepting any fund offer. PRPs would not face liability for insurer legal costs, and, because PRPs that have filed suit against their insurers (the same PRPs voting in the referendum) have 60 days from passage to reject any fund offer and immediately pursue their insurers, even the stay on coverage litigation could be avoided.
many nonsettlers is considered acceptable) need to be carefully considered. Because it is difficult to know how the referendum should be designed, it may well be that the referendum should be dropped in favor of early and regular congressional review of the fund’s performance.

Several factors were mentioned above that might limit reductions in transaction costs caused by the fund, but their effect is uncertain. Coverage cases around non-NPL sites may keep the total number of coverage cases near current levels, but it is not clear how vigorously PRPs and insurers would continue to contest coverage when 40 percent or more of the costs under contention has been eliminated. It is also not clear how many PRPs excluded from the fund because they are not actively pursuing their insurance would go after their insurers directly. Since the fund would have the authority to make offers to PRPs that did not have active claims, the extent to which exclusion of PRPs that are not actively pursuing claims is a problem will depend partly on the fund itself.

If the Environmental Insurance Resolution Fund passes the early referendum, there is good reason to expect that PRPs will accept a sizable proportion of the fund’s offers, eliminating a great deal of coverage litigation between PRPs and insurers. The fund would not eliminate all sources of transaction costs between PRPs and insurers, and it may even create some new ones, but it is clearly a step in the right direction. If it proves successful, perhaps the resolution fund could be expanded to deal with non-NPL sites and all PRPs with valid insurance contracts, not just those actively pursuing claims.

**INSURER-REINSURER INTERACTION**

To protect themselves against very large losses, insurers often have insurance policies with other insurers, called *reinsurers*. These policies usually have very high deductibles as well as high policy limits. According to industry sources, reinsurer expenditures have only recently begun to rise, but as insurers’ losses mount, insurers may turn more frequently to their reinsurers for reimbursement. Many of the same coverage issues between PRPs and insurers may arise between insurers and their reinsurers, generating substantial transaction costs.
The Proposed Legislation

Taxes and fees would be levied on both insurers and on reinsurers to fund the Environmental Insurance Resolution Fund. In return for contributing to the fund, reinsurers are released from any liability for insurer contributions to the fund (p. 32). Because many reinsurers are foreign firms from which it may be difficult to collect taxes and fees, recovery would be allowed against those reinsurers that did not pay into the fund.

Strengths

The proposed legislation eliminates possible contention over whether insurers could recover contributions to the fund from reinsurers. To the extent that the fund reduces direct payments from insurers to policyholders, it also reduces the amount sought from reinsurers, and thus presumably the contention between insurers and reinsurers.

Weaknesses

Insurers would presumably continue to go to their insurers for expenses not covered by the fund. Such expenses include cleanup costs at non-NPL sites, payments made to policyholders who rejected fund offers, and payments to policyholders excluded from the fund. Also, insurers would still be able to pursue cost recovery from foreign reinsurers that decide not to pay the taxes or fees.

Evaluation

Most of the issues relevant to evaluating the legislation’s effect on insurer-PRP transaction costs also apply to the effect on insurer-reinsurer transaction costs. To the extent that the fund resolves insurer-PRP disputes, it will probably also reduce insurer-reinsurer disputes.
The final set of interactions involves the local community around the site. The local community interacts with both the government and the PRPs at the site.

COMMUNITY-GOVERNMENT INTERACTION

Local communities often complain that EPA's outreach and public involvement efforts are conducted as a monologue rather than a dialogue and that cleanup decisions do not reflect their concerns (see National Commission on Superfund, 1993, Chapter 3). Consequently, they sometimes oppose the method and level of cleanup. Their opposition can significantly delay cleanup and generate substantial negotiation and legal costs.

The interaction between the community and the government is complicated by the fact that community interests are usually diverse and often conflicting. For example, residents near the site may push for stringent cleanup standards and treating rather than containing the waste. However, they may also be opposed to incinerating waste
on-site because they are concerned about air emissions during incineration. Other residents may favor a containment remedy that PRPs will agree to implement so that the Superfund stigma can be quickly removed from the community and so that business redevelopment can begin.

In addition to diversity of interests, the technical nature of the cleanup debate and great scientific uncertainty in virtually all aspects of the problem make it difficult for the community to be well-informed and be a productive participant in the decisionmaking process.

**The Proposed Legislation**

The proposed legislation directs EPA to seek direct, meaningful involvement by the local community in each significant phase of the cleanup process. To fulfill this obligation, EPA will be required to provide information to the community, consider the views of the community in all critical decisions, and explain in writing decisions inconsistent with community wishes.

The primary vehicle for this two-way communication is the Community Working Group (CWG), which communities may request to be established. A CWG could contain up to 20 members, appointed by the President or his representative. Members would be drawn from local residents, environmental groups, the business community, local government officials, PRPs at the site, and other stakeholders. The CWG would provide recommendations during each phase of the cleanup process; in particular, it would participate in future land-use decisions. The government would not be bound by any CWG recommendation, but it would have to explain in writing decisions that were inconsistent with CWG recommendations. In the event that there were substantive disagreements within the CWG, the government would try to reconcile them (pp. 8–12).

**Strengths**

The expanded right of the community to participate in the decision-making process may reduce community opposition at the site. It may also result in cleanup decisions that better serve the commu-
nity. National cleanup standards and generic remedies may allay community fears that a proposed cleanup is inadequate or less protective than at other sites and may reduce opposition.

**Weaknesses**

Increased community involvement may also increase the complexity of the decisionmaking process and may generate substantial delays and negotiating costs. By potentially focusing community sentiment, the proposed CWG may also make the community more vocal about decisions it considers adverse to its interests and induce it to seek their reversal more vigorously.

Increased community involvement may also exert pressure to raise cleanup costs higher than they would have been otherwise. Because community groups will not pay directly for the cleanup, they may not have appropriate incentives to properly weigh the costs and benefits of different cleanup options. Increased pressure for expensive remedies may induce more fighting by PRPs.

The legislation also makes EPA’s role more difficult. The agency must assume the burden of written responses when its decisions are at odds with those of the CWG, and it must mediate differences within the CWG, a task for which it is probably ill equipped.

**Evaluation**

Increasing the community’s role in the decisionmaking process may well slow that process and generate more transaction costs. Those costs may possibly be offset by reduced community opposition later on. But given the lack of consensus within most communities about how sites should be cleaned up, it is quite possible that community opposition will endure despite increased involvement.

Increased community involvement would not unambiguously cause cleanup costs to increase. The expensive remedies usually involve incineration or removal of large quantities of hazardous substances from the site. Communities may oppose both approaches, fearing air emissions from incinerators or truck accidents. Communities may also be concerned about the effects of high cleanup costs on local employers. The fact that community groups do not directly pay
for the cleanup remains a valid concern, however, and consideration should be given to making communities aware of the drawbacks of expensive remedies both to their communities and to society at large. To balance broad representation and efficient decisionmaking, consideration should also be given to determining the optimal size for a CWG.

COMMUNITY-PRP INTERACTION

Residents and landowners near Superfund sites can sue PRPs for bodily injury and property damage (BI/PD). In some cases, local residents request compensation for adverse health effects allegedly caused by the site. In others, they seek coverage for medical monitoring to detect health problems early on. Landowners near a site may seek compensation for the spread of hazardous substances onto their land or the decline in property value.¹ Both local residents and landowners frequently use the information on the condition of the site, the hazardous substances present, and the identities of the PRPs that become available during the cleanup process to make their cases.

Overall figures on the number and cost of BI/PD cases involving Superfund sites do not exist, but RAND research suggests that they are significant. Table 5.1 shows that legal and other transaction costs related to BI/PD cases were approximately one-quarter as large as the transaction costs related to the cleanup process for 108 PRPs at 18 NPL sites between 1981 and 1991. So far indemnity payments related to BI/PD cases appear to be relatively small, but they may increase over time as more claims are resolved.

Although the Administration proposal does not address BI/PD cases, it may have some indirect effects on BI/PD claims. If the proposed legislation increases the pace of cleanups and there are fewer injuries or losses as a result, fewer BI/PD claims may be made. On the other hand, the allocator's report at a site may make it easier for plaintiffs to establish liability, and increased reliance on containment remedies may mean more claims in the future if such remedies fail. Also, enhanced community involvement would probably increase both

¹For an example of such suits, see Wall Street Journal, February 9, 1994, p. 1.
Table 5.1
Expenditures of 108 PRPs at 18 NPL Sites

<table>
<thead>
<tr>
<th>Type of Expenditure</th>
<th>Millions of Dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remedial Process(^a)</td>
<td></td>
</tr>
<tr>
<td>Transaction costs</td>
<td>27.7</td>
</tr>
<tr>
<td>Cleanup costs</td>
<td>106.4</td>
</tr>
<tr>
<td>BI/PD Cases(^b)</td>
<td></td>
</tr>
<tr>
<td>Transaction costs</td>
<td>6.7</td>
</tr>
<tr>
<td>Indemnity</td>
<td>2.0</td>
</tr>
</tbody>
</table>

\(^a\)Dixon, Drezner, and Hammitt, 1993, p. 20.
\(^b\)Tabulations of data collected for 1993 study.

community awareness of the site and knowledge about potential adverse health and other effects, which may increase the number of adverse outcomes attributed to the site and thus the number of BI/PD claims.

It is difficult to anticipate how the proposed legislation might affect BI/PD claiming. It does not seem likely, however, that the legislation would reduce BI/PD claiming, and there is good reason to think that it may increase it somewhat.
In preceding chapters, we examined how the provisions of the Superfund Reform Act of 1994 may affect the key sets of interactions among Superfund participants. In this chapter, we summarize and evaluate the findings.

Figure 6.1 summarizes the likely effects of the proposed legislation on transaction costs as determined in preceding chapters. The interactions we have discussed appear as the column heads, and the various aspects of the Superfund process addressed by the proposal are the row labels. Assessments of effects are grouped into four categories: likely decrease in transaction costs, likely increase in transaction costs, effect uncertain, and no significant effect.

The proposed legislation seems likely to reduce transaction costs among PRPs. First, the proposed legislation would likely reduce the current complexity of the interaction among PRPs. PRPs would simply no longer do several of the things that generate transaction costs: They would no longer be responsible for cost recovery, and they would have reduced need to develop joint negotiating strategies. Releasing a potentially substantial number of \textit{de micromis} par-
ties from liability altogether would also reduce the complexity of the PRP-PRP interaction.

Second, the proposed legislation appears to create a more effective division of tasks in the allocation process. The neutral allocator would have information-gathering powers that PRPs do not have and may well develop considerable expertise after doing repeated allocations. No longer would allocation be left to an often-contentious group of PRPs.

Third, the proposed legislation should reduce PRPs' incentives to contest the allocation. Less would be at stake because liability would become *de facto* proportional, and EPA would pay for the orphan share. Proportional liability also removes an effective critique of the current system—the unfairness of having to pay for other parties'
wastes. The allocation process will remain costly, but there is good reason to expect that the proposed legislation will reduce the transaction cost generated by this aspect of PRP-PRP interactions.

The effect of the proposed legislation on the transaction costs generated by PRP-government interactions is less clear. Some of the reductions in PRP-PRP transaction costs appear to be made at the expense of PRP-government transaction costs; thus, increases are noted in Figure 6.1 for both allocation and cost recovery. But as argued in the respective chapters, such increases would seem to represent a more effective division of tasks and thus a net improvement as far as transaction costs overall are concerned.

It is uncertain how the proposed legislation will affect the transaction costs generated between PRPs and the government over standard setting and remedy selection. National standards and generic remedies may simplify and standardize the cleanup process, but a large number of issues would still need to be resolved. Future land use would have to be decided, hot spots defined, and whether to do a site-specific risk assessment determined. Standardization and less emphasis on the most expensive types of remedies may well reduce PRP incentives to contest the remedy. But the possibility that national standards will be strict or that hot spots will be broadly defined makes the effect on cleanup cost uncertain.

Increased community involvement may increase pressure for expensive remedies and thus heighten PRP opposition, but community concern about the effect of expensive remedies on local employers or the dangers of expensive remedies such as incineration may make the intensity of community pressure for expensive remedies uncertain.

In contrast to the aspects of the PRP-government interaction described so far, there is good reason to believe that the settlement process would generate fewer transaction costs under the proposed legislation (see Figure 6.1). Settlement terms appear far more favorable to PRPs under the proposed legislation, which may reduce PRP incentives to resist settlements. Proportional liability should also considerably reduce a PRP's incentives to contest settlements it perceives to be overly favorable to other PRPs.
The settlement process would remain complex under the proposed legislation. Individual settlements, expedited settlements, and determining which PRPs have limited ability to pay would likely require substantial EPA resources. But it seems likely that the resources invested would yield far more in settlements than the current system. How well the settlement process works under the proposed legislation will depend, in part, on how EPA implements the program—in particular, EPA should pay careful attention to how it sets settlement premiums and what incentives it provides to PRPs to actually do the cleanup.

The overall effect of the proposed legislation on the transaction costs generated by PRP-government interactions is the sum of the effects on each separate aspect of the interaction. The proposed legislation is likely to increase PRP-government transaction costs for two aspects, reduce them for one, and have an uncertain effect for two (see Figure 6.1). The two aspects for which transaction costs may increase do not simply outweigh the other aspects, because the changes in transaction costs may be far larger for some aspects than for others. Nevertheless, although the proposed legislation appears to be moving in the right direction, the overall effect on PRP-government transaction costs is uncertain at this point.

The Environmental Insurance Resolution Fund should simplify insurer-PRP interactions and reduce the incentives for PRPs to pursue their insurers in court and for insurers to resist. The resolution fund would remove insurance disputes from a setting that has not proved effective in resolving the issue of who should pay; it would also set up a standardized process for paying claims. In deciding whether to go to court, a PRP would now compare the expected outcome in court with the fund’s offer (and potential liability for legal costs) rather than with receiving no insurance payment at all. Key to reducing transaction costs will be the share of PRPs that accept fund offers. The early referendum should prevent a situation in which a costly bureaucracy is set up but few disputes are resolved. But careful consideration should be given to whether the conditions for passage are too strict. The resolution fund does not eliminate all sources of transaction costs, but if it passes the referendum, it seems likely to reduce insurer-PRP transaction costs. To the extent that the fund reduces insurer-PRP transaction costs, it will probably also reduce insurer-reinsurer transaction costs.
Public participation in government decisionmaking is an important part of the democratic process, but enhanced community involvement would likely come at the cost of higher transaction costs between the community and the government. Enhanced community involvement may reduce community opposition at a site later, but the increased complexity of the decisionmaking process, combined with the likely persistence of divisions within the community about how a site should be cleaned up, would appear to cause an overall increase in transaction costs between the community and the government.

The proposed legislation may also directly increase transaction costs between the community and PRPs. Increased community involvement may increase community awareness and information about the site, which may, in turn, generate more bodily injury and property damage cases.

If adopted, the Superfund Reform Act of 1994 would fundamentally change the way the Superfund program operates. The process would remain complex, but important parts would be simpler and more standardized. The proposed legislation reassigns several tasks to different parties that may be able to perform the task more efficiently than under the current system. It appears that the PRPs would have far greater incentives to cooperate than to contest under the proposed system. A number of troubling features remain, but the proposed legislation seems to take a significant step toward reducing transaction costs.
DERIVATION OF ESTIMATED OVERALL PRIVATE-SECTOR TRANSACTION-COST SHARE

In this Appendix, findings from earlier RAND reports on transaction costs are combined with EPA data to estimate transaction-cost shares for combined PRP and insurer expenditures. Calculations for expenditures through 1991 are described first, followed by calculations for expenditures when cleanup is complete.

OVERALL TRANSACTION-COST SHARE THROUGH 1991

According to the Environmental Protection Agency, EPA negotiated $5.95 billion in PRP response settlements for cleanup costs through 1991 (EPA, 1992, p. III-3). There is considerable uncertainty in how closely this amount reflects true private-sector cleanup expenditures through 1991. On the one hand, it includes neither settlements negotiated with the states nor work PRPs may have done without a
formal agreement.\textsuperscript{1} On the other hand, these settlements are only commitments to pay—the actual outlays may come later.

We used $5.95 billion as a starting point for PRP response settlements, but we adjusted it in two ways. The first adjustment, an increase of 44 percent, is required because the EPA number is based on cost estimates in the record of decision, but actual cleanup costs commonly exceed estimated costs. The Congressional Budget Office found that the average overrun was 44 percent at a sample of sites (CBO, 1994, p. 27). The EPA number was thus increased by 44 percent. Second, PRPs may be able to do cleanups more cheaply than the government. Using CBO’s estimate of the efficiency advantage of the private sector, we reduced the EPA estimate inflated for cost overruns by 20 percent (CBO, 1994, p. 29). To estimate overall PRP expenditures through 1991, we added the adjusted settlement total, $6.86 billion, to the $359 million in EPA cost recoveries through 1991 (EPA, 1992, p. III-5). The resulting sum is $7.21 billion.

We collected expenditures from four national insurers from 1986 to 1989 on claims involving inactive hazardous waste sites (NPL and non-NPL). To extrapolate these amounts to cumulative expenditures through 1991, we assumed that costs grew linearly from zero in 1982 to their observed level in 1986 and at the average growth rate for 1988 and 1989 (35 percent) in 1990 and 1991. The results are presented in Table A.1.

We estimated that overall expenditures by the nation’s insurers at NPL sites were $149 million in 1989 (Dixon, Drezner, and Hammitt, 1993, p. 60).\textsuperscript{2} To scale this figure up to cumulative expenditures through 1991, we multiplied by the ratio of projected cumulative expenditures through 1991 for the four national insurers to 1989 expenditures in Table A.1. (This ratio is 6.76.) Multiplying $149 million by this ratio implies the nation’s insurance industry spent $1.01 billion on claims involving NPL sites through 1991.

\textsuperscript{1}For example, a PRP may have cleaned up contamination on its own property on or near a site, without formal agreement with EPA. We saw several examples of this practice during our studies.

\textsuperscript{2}Costs on bodily injury and property damage claims related to Superfund sites were excluded from this estimate.
Table A.1

<table>
<thead>
<tr>
<th>Year</th>
<th>Millions of Dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>1981&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0</td>
</tr>
<tr>
<td>1982&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0</td>
</tr>
<tr>
<td>1983&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2.2</td>
</tr>
<tr>
<td>1984&lt;sup&gt;a&lt;/sup&gt;</td>
<td>4.5</td>
</tr>
<tr>
<td>1985&lt;sup&gt;a&lt;/sup&gt;</td>
<td>6.7</td>
</tr>
<tr>
<td>1986&lt;sup&gt;b&lt;/sup&gt;</td>
<td>8.9</td>
</tr>
<tr>
<td>1987&lt;sup&gt;b&lt;/sup&gt;</td>
<td>9.6</td>
</tr>
<tr>
<td>1988&lt;sup&gt;b&lt;/sup&gt;</td>
<td>13.5</td>
</tr>
<tr>
<td>1989&lt;sup&gt;b&lt;/sup&gt;</td>
<td>17.6</td>
</tr>
<tr>
<td>1990&lt;sup&gt;a&lt;/sup&gt;</td>
<td>23.7</td>
</tr>
<tr>
<td>1991&lt;sup&gt;a&lt;/sup&gt;</td>
<td>32.1</td>
</tr>
<tr>
<td>TOTAL</td>
<td>118.7</td>
</tr>
</tbody>
</table>

<sup>a</sup>Estimated outlays.

<sup>b</sup>Actual outlays from Acton and Dixon, 1992, p. 20.

Insurer outlays cannot simply be added to PRP outlays to determine total private-sector outlays, because some insurer payments are made to PRPs. To avoid double-counting, we make some assumptions about the destination of insurer expenditures. As shown in Table A.2, we assumed that all indemnity payments (12 percent) are made to PRPs and that coverage litigation payments and claim investigation expenditures do not go to PRPs. We assume that 50 percent of payments to defend the policyholder go to the policyholder. Varying this percentage from 30 to 70 percent changes the final results very little.

PRP transaction costs through 1991 are derived from cleanup costs, so that the PRP transaction-cost share is 32 percent. The resulting cleanup costs, transaction costs, and transaction-cost (TC) shares for PRPs, insurers, and the private-sector through 1991 are shown in Table A.3.
Table A.2
Distribution of Insurer Expenditures Through 1991 and at Completion of Cleanup

<table>
<thead>
<tr>
<th>Insurer Expenditure</th>
<th>Percentage</th>
<th>Through 1991</th>
<th>At Completion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indemnity (all to PRPs)</td>
<td>12</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>Coverage Disputes (not to PRPs)</td>
<td>42</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>Duty to Defend</td>
<td>37</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>Payment to PRPs</td>
<td>19</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Payment not to PRPs</td>
<td>19</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Internal (not to PRPs)</td>
<td>9</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

Table A.3
PRP, Insurer, and Total Private-Sector Expenditures and Transaction-Cost Shares Through 1991

<table>
<thead>
<tr>
<th>Expenditure</th>
<th>Insurers</th>
<th>PRPs</th>
<th>To PRPs</th>
<th>Not to PRPs</th>
<th>Total</th>
<th>Total Private Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outlays ($ millions)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cleanup</td>
<td>7,219</td>
<td>121</td>
<td>0</td>
<td>121</td>
<td></td>
<td>7,219</td>
</tr>
<tr>
<td>Transaction costs</td>
<td>3,396</td>
<td>186</td>
<td>700</td>
<td>886</td>
<td>4,097</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>10,616</td>
<td>307</td>
<td>700</td>
<td>1,007</td>
<td>11,316</td>
<td></td>
</tr>
<tr>
<td>TC Share (percent)</td>
<td>32</td>
<td>61</td>
<td>100</td>
<td>88</td>
<td>36</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: Discrepancies in addition are due to rounding.

OVERALL TRANSACTION-COST SHARE AT CLEANUP COMPLETION

The average cleanup cost at nonfederal NPL sites is assumed to be $26.5 million, which is the midpoint of the estimated range for cleanup costs reported in Chapter One. For the 1,177 nonfederal NPL sites currently on the NPL, this amount implies that ultimate cleanup costs will be approximately $31.2 billion. In recent years,
EPA has funded approximately 20 percent of remedial actions and greater percentages of removals, remedial investigation and feasibility studies, and remedial designs. These percentages were higher in the past (EPA, 1993a, p. III-1). We assume that EPA will have funded 30 percent of total cleanup costs at completion but, consistent with the discussion of cost recovery in Chapter Two, that EPA will be able to recover one-third of these costs from PRPs. To determine PRP expenditures at completion, we consequently reduced the $31.2 billion by 20 percent, to $25.0 billion, to account for the portion of final cleanup costs that will be borne by EPA. Following the projections in Dixon, Drezner, and Hammitt (1993), we calculated overall private-sector costs under two different assumptions for the ultimate PRP transaction-cost share: (1) 19 percent and (2) 27 percent.

At completion, the overall insurer transaction-cost share was assumed to be 69 percent. We proportionally reduced the shares for each category of insurer expenditures from their values through 1991, so that instead of summing to 88 percent, they sum to 69 percent (see Table A.2). We also assumed that insurer expenditures at completion remain in the same ratio to PRP expenditures as they were in 1991 (9.5 percent). The resulting expenditures and transaction-cost shares for the two scenarios are presented in Tables A.4 and A.5.

Table A.4
PRP, Insurer, and Total Private-Sector Expenditures and Transaction-Cost Shares at Completion, Scenario 1

<table>
<thead>
<tr>
<th>Expenditure</th>
<th>PRPs (T)</th>
<th>PRPs (N)</th>
<th>Not to PRPs</th>
<th>Total Private Sector</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleanup</td>
<td>25,000</td>
<td>909</td>
<td>0</td>
<td>909</td>
<td>25,000</td>
</tr>
<tr>
<td>Transaction costs</td>
<td>5,864</td>
<td>425</td>
<td>1,988</td>
<td>2,023</td>
<td>7,462</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>30,864</td>
<td>1,334</td>
<td>1,588</td>
<td>2,932</td>
<td>32,462</td>
</tr>
<tr>
<td>TC Share (percent)</td>
<td>19</td>
<td>32</td>
<td>100</td>
<td>69</td>
<td>23</td>
</tr>
</tbody>
</table>
Table A.5

PRP, Insurer, and Total Private-Sector Expenditures and Transaction-Cost Shares at Completion, Scenario 2

<table>
<thead>
<tr>
<th>Expenditure</th>
<th>PRPs</th>
<th>To PRPs</th>
<th>Not to PRPs</th>
<th>Total</th>
<th>Total Private Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outlays ($ millions)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cleanup</td>
<td>25,000</td>
<td>1,009</td>
<td>0</td>
<td>1,009</td>
<td>25,000</td>
</tr>
<tr>
<td>Transaction costs</td>
<td>9,247</td>
<td>472</td>
<td>1,773</td>
<td>2,245</td>
<td>11,020</td>
</tr>
<tr>
<td>TOTAL</td>
<td>34,247</td>
<td>1,480</td>
<td>1,773</td>
<td>3,253</td>
<td>36,020</td>
</tr>
<tr>
<td>TC Share (percent)</td>
<td>27</td>
<td>32</td>
<td>100</td>
<td>60</td>
<td>31</td>
</tr>
</tbody>
</table>

NOTE: Discrepancies in addition are due to rounding.


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