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The Superfund Debate

Richard L. Revesz and Richard B. Stewart

During the last decade, the Superfund approach to environmental liability and remediation has become highly controversial. The costs of remediating the environmental problems caused by hazardous substances are great, although Superfund is far from the most costly U.S. environmental program. Its annual costs are in the range of $3 to $5 billion—a fraction of the costs of the federal air or water pollution regulation programs.

Much of the controversy generated by Superfund stems from its far-reaching statutory system of liabilities, which goes far beyond that of the common law.

- Liability is strict; no showing of fault or negligence on the part of a defendant is required.
- Liability is retroactive, in the sense that deposits of waste that occurred before Superfund’s enactment can form the basis for liability for remedial costs incurred after its enactment.
- Liability is also joint and several; unless a defendant can show that the risk or harm attributable to it is “divisible,” each of the defendants in some way responsible for the wastes at a site can be potentially singled out to bear all of the cleanup costs.

The broad net of Superfund liability includes current and past owners and operators of waste sites and waste generators and transporters. Defendants at Superfund sites include not only large industrial firms, but also a broad array of other entities—municipalities, local dry cleaners, hospitals, and a myriad of small businesses. As a result of this expansive liability regime, Superfund also has had significant effects on the real estate, banking, and insurance industries, as well as on the legal profession.

Defendants have criticized the cleanup levels demanded by the U.S. Environmental Protection Agency (EPA) as excessively stringent
and costly. Superfund is also widely regarded as a wasteful and inefficient program, plagued by high transaction costs, serious administrative deficiencies, and long delays in cleaning up sites.

After a contentious debate, the 106th Congress failed to reauthorize Superfund in 1994. The debate will be renewed in the 104th Congress; in light of the changed political composition of the new Congress, significant amendments may well be adopted. Critics of the current system have urged major changes. The most far-reaching could replace the current system of liability with a tax-funded public works program. Many environmental groups, however, strongly defend the basic features of the Superfund program as essential to fund the cleanup of past hazardous waste problems and to provide strong incentives to prevent them from recurring in the future. Legislative changes to the current program are likely to focus on moderating required cleanup levels, reducing the scope of liability, limiting retroactivity, and creating an expanded cleanup fund financed by insurers.

The purpose of this book, based on the papers presented at the Conference on Superfund Reauthorization: Theoretical and Empirical Issues, which took place at the New York University School of Law on December 3-4, 1993, is to provide a serious look at the issues most relevant to the reauthorization debate and the future of the program. To aid the reader to this end, we introduce in this chapter the relevant components of the Superfund statute itself, including the liability and taxing regimes, the impact of the liability regime on various sectors of the U.S. economy, the site cleanup process, and the determination of cleanup standards.

We then summarize the conference papers (now the chapters in this book) and their links to the ongoing public policy debate. The issues addressed are basic to understanding Superfund and will continue to be relevant long after reauthorization. Although the issues are related, each chapter is self-sufficient. Readers interested in particular issues can accordingly limit their attention to the pertinent chapters.

THE SUPERFUND STATUTE

The dangers of unregulated land disposal of hazardous wastes were powerfully brought to national attention in the summer of 1978, when toxic chemicals surfaced in basements and schoolyards in the community of Love Canal, New York. Between 1942 and 1953, the Hooker Chemical Company filled an abandoned site (a hydroelectric channel) with more than 21,000 tons of chemical wastes. In 1953, Hooker covered the site with earth and clay and sold it to the Niagara Falls Board of Education for $1. A school and playground were built on the site. The surrounding vacant land was developed into a residential community.

In the years that followed, residents noticed foul odors after heavy rains and during humid conditions, but most attributed these odors to nearby industrial facilities. Increased precipitation in the early 1970s raised groundwater levels, causing thick, oily sludges to seep into basements and accumulate on the surface. In 1976, a joint U.S.-Canada commission responsible for monitoring conditions on Lake Ontario identified high levels of the insecticide Mirex in fish; these contaminants were traced to Love Canal. This finding generated public concern, leading to the initiation of groundwater tests and epidemiological studies. In August 1978, New York’s health commissioner declared a public emergency. The news media descended upon Love Canal, broadcasting images of a middle American community mired in a swamp of hazardous waste. The health commissioner’s report, “Love Canal: Public Health Time Bomb,” coined a powerful metaphor for focusing public attention upon the risks of abandoned hazardous waste sites (Mellin and Stewart 1984).

Other contemporaneous events, such as the serious toxic spill of pesticides in the James River in Virginia and the discovery of tens of thousands of barrels of discarded, leaking, and unlabelled wastes in the “Valley of the Drums” in Kentucky, added to the perception of a national crisis. Congress acted quickly. Although it had already enacted in 1976 a comprehensive statute—the Resource Conservation and Recovery Act (RCRA)—to regulate treatment, storage, and disposal of hazardous wastes, RCRA’s primary thrust was the prevention of future harms rather than the cleanup of sites inherited from the past.

Hearings began in early 1979, and on December 11, 1980, President Jimmy Carter signed into law the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), which came to be known popularly as the “Superfund” statute. There was broad bipartisan consensus on the immediacy of the crisis and the need for legislation—a consensus that will be difficult to replicate for its reauthorization in 1995. Although Superfund was voted in Congress following the November election, in which President Carter had been defeated and the Democrats had lost control of the Senate, the favorable vote was 274 to 94 in the House and 78 to 9 in the Senate. CERCLA was substantially amended in 1986 by the Superfund Amendment and Reauthorization Act (SARA). It was reauthorized once more in 1990 (as part of the Omnibus Budget Reconciliation Act) without any substantive amendments.

Several of the features of the current statutory scheme are particularly relevant as background to the consideration of the chapters in this book. We will focus on the liability and taxing regimes, the cleanup process, and the determination of cleanup standards.
The Liability and Taxing Regimes

Under Superfund, the cleanup of hazardous waste sites is funded by two separate sources: a liability regime and a taxing regime.

The Liability Regime. Superfund contains an extensive and far-reaching liability scheme. Liability is triggered when the government or a private party incurs response costs in dealing with a release or threatened release of hazardous substances into the groundwater, surface water, soil, or air. In the event of such a release, the following categories of parties, often referred to as potentially responsible parties (PRPs), are liable: the current owner or operator of the site at which the release occurs; prior owners and operators during whose period of ownership there was disposal of hazardous substances at the site; generators of the hazardous substances; and transporters of the hazardous substances who had responsibility for selecting the site. Liability is also imposed on an owner of the site who, though not otherwise liable, obtains knowledge of the release or threatened release and subsequently transfers the property without disclosing such knowledge.

The liability standard under the statute is strict liability, rather than negligence. Thus, a PRP cannot avoid liability by showing that it met the regulatory or common law standards of care applicable at the time that it engaged in the activity, or even that it was also complying with hazardous waste regulatory standards currently in force.

Liability under Superfund is both retroactive and prospective. In addition to imposing liability for cleanup costs attributable to generation, transportation, treatment, storage, or disposal of hazardous substances undertaken before the passage of the statute, it also attaches cleanup costs for wastes disposed after the passage of the statute.

The defenses to liability are extremely limited. A PRP can escape liability only if it can show that the release or threatened release was caused solely by an act of God, an act of war, an act or omission of a third party, or a combination of these causes. Not surprisingly, only the third-party defense has been of practical significance, and the Superfund statute imposes significant limitations on it. Although this defense is the source of considerable litigation, very few PRPs have successfully established it.

A PRP seeking to defend on this ground must show that the third party was the sole cause of the harm, and that the third party was not the PRP’s employee or agent. Moreover, these acts or omissions cannot occur in connection with a direct or indirect contractual relationship between the third party and the PRP asserting the defense. Thus, for example, a generator cannot raise the defense if the need for a cleanup arose as a result of the actions of either its transporter or the operator of the site where the wastes were eventually deposited. The party raising the defense must also show that it exercised due care with respect to the hazardous substances and that it took precautions against foreseeable acts or omissions of the third party.

Moreover, the courts have held that PRPs are jointly-and-severally liable if the harm at the site is indivisible—that is, if the wastes are sufficiently commingled that it is not possible to determine which wastes were responsible for the release. PRPs have the burden of showing that the waste and corresponding cleanup costs for which they are responsible are divisible from those attributable to other parties.

Joint-and-several liability is coupled with a right of contribution, so that if one PRP had to pay the full cleanup costs at a site, it could require other PRPs to pay their equitable shares of the liability. The right of contribution, however, is unavailing if other PRPs are insolvent or cannot be located. Accordingly, the solvent PRPs, as a group, must absorb the “orphan” shares of insolvent or absent PRPs. The existence of joint-and-several liability is especially significant in the Superfund context. Because significant periods of time—often several decades—can elapse between the disposal of hazardous substances and the cleanup, it is particularly likely that some PRPs will not be found or will be insolvent once they are found.

The Superfund statute also has causation requirements that are highly attenuated. Thus, a PRP can be liable even if it cannot be shown that its hazardous substances were the ones implicated in the release or threatened release that gave rise to cleanup costs. Liability can be imposed upon a PRP if its hazardous substances at some point were present at a site at which there was later a release or threatened release of the same or even another hazardous substance.

In addition to its cleanup provisions, CERCLA authorizes federal, state, and Indian tribe authorities who manage or control natural resources to sue for damages to such resources resulting from the release of a hazardous substance. The categories of persons liable are the same, and the principles of liability are generally the same, as in the cleanup program. Thus, for example, contamination at a site might lead to the impairment or destruction of wetlands. Following a cleanup that removes the hazardous substances from the site, the PRPs could remain liable for natural resource damages (NRD) in connection with any residual damage to the wetlands.

The Taxing Regime. The Superfund taxing provisions are an adjunct to the liability scheme. Currently, three separate taxes are levied on chemicals, petroleum products, and general corporate profits to finance the
Hazardous Substances Superfund (the trust fund), which gives the statute its popular name. This fund is used for two primary purposes: to pay for cleanups at sites at which all the PRPs are either insolvent or unknown, and to advance money for EPA cleanups at other sites pending EPA’s recovery of cleanup costs from the PRPs. Thus, the fund is a revolving as well as residual form of financing, which covers cleanup costs that cannot be recovered through the liability scheme. At the time of the passage of CERCLA in 1980, Congress authorized a $1.6 billion fund, with the money to be raised over five years. The 1986 SARA amendments provided for an additional $8.5 billion, also to be raised over five years. When Congress reauthorized the statute in 1990, it provided for a funding level of $5.1 billion between October 1, 1991, and September 30, 1994. The total costs of cleaning up sites potentially subject to Superfund have been estimated at $100 billion or more.

Impact of the Liability Regime

The Superfund liability scheme has transformed vast sectors of the U.S. economy and has had effects far beyond the PRPs at Superfund sites. Our discussion in this regard focuses on the real estate, banking, and insurance industries, as well as on municipalities and the legal profession, where the impact of Superfund has been particularly significant.

The Real Estate Industry. Purchasers of real estate face the threat that they will buy contaminated land and that, at some point in the future, they will face liability as the current owners of the land. CERCLA recognizes an “innocent landowner” defense to owner liability. In order to assert this defense, an owner must establish that at the time it acquired the facility it did not know and had no reason to know about the hazardous substances responsible for the release or threatened release. Having “no reason to know” is further defined as undertaking “all appropriate inquiry... consistent with good commercial or customary practice.” In order for purchasers to take advantage of this defense and avoid potentially far-reaching liabilities, it is now customary in the context of transfers of commercial real estate for purchasers to undertake environmental assessments, which, depending on the circumstances, can include extensive testing of soil and groundwater.

The Banking Industry. With respect to the banking industry, the statute, somewhat confusingly, exempts from liability “a person, who, without participating in the management of a list,” holds indicia of ownership primarily to protect his security interest.” Two categories of cases involving mortgage lenders are relevant. First, if the borrower defaults and the lender forecloses, taking title to the property, logic would suggest that because the lender then acquires full indicia of ownership it can no longer qualify for the exemption and would face liability as a current owner. Second, preforeclosure liability arises when the bank becomes sufficiently involved in the activities of the debtor—for example, by monitoring the debtor’s operations—that it is deemed to participate in the debtor’s management. Unfortunately, the courts have been quite divided about what constitutes too much involvement, and a regulation by EPA attempting to clarify the issue was recently struck down in the courts as beyond EPA’s authority.

As a result, banks routinely perform, or require the performance of, environmental assessments before they approve mortgages for commercial real estate. Moreover, critics of Superfund claim that the potential liability of banks, and, perhaps more importantly, the considerable uncertainty surrounding the scope of such liability, has undesirably increased the cost and reduced the availability of credit, especially for small businesses.

The Insurance Industry. The insurance industry also has been centrally affected by the Superfund statute. Between 1973 and 1986, the standard comprehensive general liability (CGL) policy held by individuals and corporations included a pollution exclusion clause, which provided that insurance would not cover bodily injury or property damage arising out of pollution except if the release was “sudden and accidental.” In large part as a result of Superfund, insurers amended this clause in 1986, explicitly excluding any pollution-related liability. The impact of Superfund on the insurance industry is manifested in two distinct ways.

First, firms interested in protecting against liability for pollution must now purchase specialized insurance, which, to the extent it is available at all, carries high premiums, high deductibles, high loss payment limits, and low caps. Moreover, the availability of such insurance is quite limited. Thus, many firms have had little option but to self-insure, sometimes risking bankruptcy in the event of an environmental accident.

Second, Superfund has raised an enormous amount of contentious litigation concerning the liability of insurers under policies written before the 1986 change in the pollution exclusion clause. PRPs in Superfund actions routinely seek indemnification from their CGL insurers. The interpretation of insurance contracts is a matter of state law, and the state supreme courts that have addressed the issue have split almost evenly on whether the release or threatened release of hazardous substances at Superfund sites is “sudden and accidental” and meets the other terms of policy coverage. The litigation on this matter between insureds and insurers has consumed exceedingly high transac-
tion costs and has led to proposals for the establishment of a fund (to supplement the existing trust fund), financed by assessments on insurance companies, to pay for a portion of Superfund cleanup costs in place of case-by-case litigation between insureds and insurers.

Municipalities. Municipalities also have been caught in the Superfund web. Typically, municipal solid waste contains a small percentage of hazardous substances. Some municipalities disposed of this waste at sites also used by industrial generators. If liability is apportioned proportionally to the aggregate amount of waste contributed by each PRP, on the premise that cleanup costs are roughly proportional to the volume of waste to be cleaned up, the municipalities will generally bear a high percentage of the costs. If, instead, the relevant criterion is the amount of hazardous substances in the waste contributed by each PRP, the bulk of the burden will be placed on the industrial generators. Judicial decisions adopting the former approach have threatened to imperil the financial stability of some small towns.

The Legal Profession. The legal profession has also been powerfully affected by the Superfund liability scheme. In the 1970s, the bulk of environmental law practice consisted in large part of challenging EPA and state command-and-control regulations and the implementation of those regulations. Typical lawsuits pitted industry firms or environmental groups on one side against the federal government on the other. The specialized environmental bar was disproportionately located in Washington, D.C. Largely as a result of Superfund, environmental disputes now routinely involve controversies among industrial and commercial firms that are PRPs at the same site, and between such firms and insurers and banks. The federal government is sometimes both the enforcer of the law and a polluter responsible for cleanup costs at a site. As a result of the broad scope of Superfund liability, environmental law has become a standard component of legal practice nationwide.

The Cleanup Process

The process leading to the cleanup of Superfund sites is cumbersome and slow, and consists of several stages. First, EPA must become aware of a site's existence. Generally, a site is brought to the agency's attention by a state or municipality, or by citizen complaints; there is no federal discovery program. EPA then places the site in the CERCLA Information System (CERCLIS)—the inventory of locations that potentially require cleanup. To date, over 28,000 sites have entered the CERCLIS database.

Second, EPA conducts a Preliminary Assessment (PA) to ascertain the risks posed by the site. If warranted, a Site Inspection (SI) then follows. At each of these stages, many sites are classified as sufficiently harmless to warrant no further attention.

Third, EPA ranks sites under the Hazard Ranking System (HRS). The HRS is composite score that measures the risk of the site by reference to three possible routes of human exposure: groundwater, surface water, and air.

Fourth, sites that receive a score above a given cut-off are placed on the National Priorities List (NPL); currently there are over 1,200 sites on the NPL. Only sites listed on the NPL are eligible for the expenditure of money by EPA for long-term remedial action from the trust fund. This limitation, however, does not apply to EPA removal actions (quicker and less extensive measures often undertaken in the face of emergencies). For sites on the NPL, the fifth stage of the process involves the preparation of a Remedial Investigation/Feasibility Study (RI/FS). This stage consists of a more detailed examination of the site and a preliminary study of possible remedies.

Sixth, EPA issues a Record of Decision (ROD). This document contains an analysis of alternative remedies, with their expected costs, and selects the remedy that will be implemented at the site.

Seventh, comes the Remedial Design/Remedial Action (RD/RA). The former is a more detailed design of the remediation technique chosen in the ROD; the latter is the actual cleanup of the site.

The process, however, does not always occur in this linear fashion. Cleanup activities at a site are often divided into separate parcels with different known or potential remediation needs and a different time frame for remediation. For example, a site might have a soil remediation project scheduled for the next fiscal year, while a groundwater remediation project is scheduled for the following year. The different remediation projects may be scheduled in parallel or in sequence, depending on the site-specific circumstances.

A RAND study completed in 1989 (Acton 1989) showed that, for a site that ultimately gets listed on the NPL, it takes on average forty-three months between the time EPA becomes aware of a site's existence and its listing. Twenty months then elapse until the beginning of the RI/FS, thirty-eight additional months until the issuance of the ROD; the RD/RA takes an additional forty-three months. Thus, on average, the time elapsed between listing on CERCLIS and the completion of the RD/RA is twelve years; eight-and-a-half years elapse between the listing on the NPL and the completion of the RD/RA.

Typically, EPA or a state in which a site is located is responsible for the stages leading to listing on the NPL. Of the later stages, the RI/FS and the RD/RA can be conducted by EPA or the state, or by a group of PRPs. In contrast, the issuance of the ROD is the sole responsibility of EPA.
In the early years of the Superfund program, EPA followed a “fund lead” strategy for cleanup. It hired contractors to carry out cleanup activities, paid them out of the fund, and then sought reimbursement from PRPs. The limited size of the fund and the delays and difficulties in obtaining reimbursement led EPA to make increasing use of an “enforcement lead” approach. Under this approach, EPA uses its CERCLA authority to issue an administrative order to PRPs or seek a court order requiring the PRPs to undertake the cleanup. Currently, PRPs are undertaking the bulk of RI/FSs and RD/RAs, typically as a result of settlements with EPA. Evidence suggests that the cost of a given cleanup is about 20% lower when it is undertaken by the PRPs rather than by EPA (see Chapter 6 in this book), presumably because private PRPs have stronger incentives to minimize costs and can supervise contractors more effectively.

The Determination of Cleanup Standards

The most important decision at any NPL site is the determination of the extent of the cleanup and the choice of cleanup technology. If the site’s soil is contaminated, should the site simply be capped to reduce the probability of releases into the groundwater, or should the soil be removed and incinerated off-site? The first option will typically be a great deal cheaper, but might pose some long-term risks. Similarly, in the face of groundwater contamination, is it sufficient to prevent migration of the contaminated groundwater through containment measures and secure an alternative source of drinking water (or do nothing at all if the contaminated groundwater is not used for drinking), or instead should one undertake a “pump and treat” program? The latter course of action will be far more expensive, and there is substantial question about its long-term effectiveness. Unfortunately, the statute says little that is helpful in answering these questions, and a wide range of remedies has been used in actual cleanups at NPL sites.

CERCLA contains two sets of provisions dealing with cleanup standards. First, it directs EPA to select remedies protective of “human health and the environment.” In making this determination, EPA is to consider a wide range of factors. For example, remedial actions must be “cost effective,” but must also “to the maximum extent practicable” utilize “permanent solutions” and technologies that will result in a “permanent and significant decrease” in the volume, toxicity, and mobility of contaminants. These provisions leave EPA with considerable discretion. EPA has tended to emphasize more permanent and costly remedies, such as treating contaminated groundwater rather than simply taking steps to prevent its migration.

Second, CERCLA requires that sites be cleaned in accordance with any “legally applicable” or “relevant and appropriate” standards (ARARs or applicable or relevant and appropriate requirements), where such standards exist. Any standard promulgated under a federal environmental law is “legally applicable” and therefore automatically an ARAR; more stringent state standards are ARARs, if certain procedural conditions are met. The statute, however, does not define when standards are “relevant and appropriate,” and therefore also ARARs. The ARAR prescription is particularly problematic in the case of groundwater contamination. The Safe Drinking Water Act (SDWA) defines permissible levels of various pollutants in publicly supplied drinking water. If groundwater at a Superfund site is contaminated by such a pollutant, the SDWA standard probably will not be deemed “legally applicable” if this groundwater is not used as the source of publicly supplied drinking water, or if it is treated before its distribution to households. The standard might, however, be deemed “relevant and appropriate” and therefore qualify as an ARAR. The Superfund statute provides that where SDWA standards are “relevant and appropriate,” the cleanups must at least achieve the Maximum Contaminant Level Goals (MCLGs) under the SDWA. (The SDWA provides that MCLGs “be set at the level at which no known or anticipated adverse effects on the health of persons occur and which allows an adequate margin of safety.” MCLGs are aspirational goals; enforceable standards or Maximum Contaminant Levels (MCLs) must be set as close to MCLGs “as is feasible.” In the case of known or probable carcinogens, MCLGs require a zero concentration of pollutants—probably an unattainable objective in groundwater remediation. The requirement that Superfund cleanups satisfy ARARs, however, is subject to significant exceptions. In the case of groundwater remediation, ARARs need not be used in a variety of circumstances, including if “the remedial action includes enforceable measures that will preclude human exposure to the contaminated groundwater.” More generally, for any remediation financed solely by the trust fund, exceptions from ARARs are appropriate on the basis of a balance between “the need for protection of public health and welfare and the environment at the facility,” and the availability of amounts from the trust fund to respond to other sites. Moreover, ARARs generally do not exist for soil remediation, which is a major element in many cleanups.

Superfund is today the environmental program that practically everyone loves to hate. Industrial firms, banks, and municipalities complain...
about the breadth of the liability regime and the high cost of cleanups. Insurers complain about being subjected to claims that they believed they had long ago contracted out of. Small businesses complain about high transaction costs. Traditional environmental groups complain about the slow pace of cleanups and the small number of sites where the remedial action has been completed. Environmental justice groups complain that disproportionately few cleanup resources have been deployed in poor and minority communities.

Despite the strong feelings that it has engendered, the Superfund program has been the subject of little dispassionate study. This book brings together some of the most recent important theoretical and empirical work on four issues central to the evaluation of Superfund: cleanup standards, the liability regime, transaction costs, and natural resource damages. The first three are the most salient issues in the authorization debate. The fourth has, until now, received less attention, yet it is potentially no less significant. Taken together, the chapters in this book, which are written from a variety of intellectual perspectives, present a mixed assessment of the Superfund program: they portray it as neither a model of successful public administration nor the monster that it is often alleged to be.

Cleanup Standards

In addition to the general recognition that the current statute provides imprecise and contradictory commands for the determination of cleanup standards, most critics of Superfund believe that cleanup costs are too high in light of the corresponding benefits. The figures are, indeed, staggering. The average cleanup cost at an NPL site is currently over $30 million. A recent study by the Congressional Budget Office places the total cleanup costs for current and future NPL sites in the $100 to $400 billion range.

The three chapters on this topic consist of empirical studies of ROEs and their factors, explaining EPA’s cleanup decisions. The chapter by Katherine Walker, March Sadowitz, and John Graham presents ten widely held stereotypes about Superfund cleanups and shows that these myths generally do not hold true. Several of their findings are particularly noteworthy. First, both the carcinogenic and noncarcinogenic risks at most NPL sites, as assessed by EPA, are substantial, and even if these risks were being systematically overstated by considerable amounts, remedial action would nonetheless be appropriate; this finding contradicts the view that Superfund expenditures are typically used to reduce already trivial risks. Second, however, estimated health risks at sites are not adjusted to reflect actions that might be taken to restrict access to the site or to contaminated groundwater; while this finding is consistent with the statutory preference for more permanent remedies, it cannot be justified in cost-benefit terms since fencing a site or providing alternative water supplies is generally far cheaper than treating soil and groundwater. Third, remedial decisions do not take into account the number of people affected at a site; this finding is consistent with the statutory requirement that ARARs be used, but it is again inconsistent with the prescriptions of cost-benefit analysis, which would call for more stringent cleanups at sites that affected larger populations.

In their chapter, James Hamilton and W. Kip Viessus also conclude that many of the estimated hazards at Superfund sites are substantial. They find, however, that the bulk of the risk that forms the basis for these estimations results from exposures to future populations that might be located on or near the site as a result of changes in current land use patterns. Most strikingly, the authors note that about 40% of the carcinogenic risk at Superfund sites is to residential populations that are hypothesized to move to Superfund sites in the future.

The Hamilton and Viessus findings should lead one to question whether one should engage in an expensive, permanent cleanup rather than taking the far less costly steps of containing the contamination, erecting a fence, and placing use restrictions in the property’s deed. While attractive at first glance, the nonpermanent alternative nonetheless might be deemed unsatisfactory for a variety of reasons. For example, one might be skeptical that the deed restrictions will be respected in the future, when public attention might have shifted to a different pressing social problem. Moreover, if a permanent cleanup is not performed, extensive operation and maintenance activities will typically have to be carried out indefinitely to ensure that the contamination does not spread. Under the CERCLA statute, the states, rather than EPA, have operational and financial responsibility for these activities and might lack the interest or expertise to carry out their responsibilities effectively. Also, the surrounding communities might object vigorously to the presence of vacant contaminated land in their midst. Because of the current perception that communities surrounding NPL sites are often disproportionately poor and minority—an issue that is the subject of ongoing empirical research—the standards for cleanup are a matter of particular concern to the environmental justice movement. Nonetheless, the findings of the Hamilton and Viessus chapter raise important questions that merit serious consideration.

The final chapter in this section, by Shreekant Gupta, George van Houtven, and Maureen Cropper, seeks to determine whether the benefits of long-term cleanups are worth their costs. Because the information
currently available is not sufficient to conduct a traditional cost-benefit analysis, the authors ask whether a comparison of costs and benefits played a role in the choice of target risk—the lifetime risk of death as a result of contamination remaining at the site after cleanup—as well as in the choice of treatment technology. The cost-benefit criterion would dictate acceptance of higher target risks at sites with higher cleanup costs. The authors find that EPA did not accept higher target risks at such sites, following the goal of protecting health without considering costs. The authors also test the claim of the environmental justice movement that EPA chooses higher target risk levels in areas that are disproportionately poor or minority. When adjusting for other relevant factors, the authors reject this hypothesis.

Underlying these three chapters is the question of whether and to what extent the cost-benefit criterion should play a role in cleanup decisions—an issue that has received close attention in the reauthorization debate. Opponents of Superfund argue that it is wasteful to engage in equally extensive cleanups regardless, for example, of the population affected by the site. Similarly, they maintain that it is irrational to insist on permanence without regard to the additional costs of more permanent cleanup strategies. If the objective were to maximize social welfare, their criticisms would certainly be well taken. However, a well-established tradition in many environmental regulatory programs holds that standards should be set at the level necessary to protect public health without considering costs, so that every person should be guaranteed some minimum level of environmental protection. The exercise is, to be sure, somewhat unreal and commentators have suggested that EPA, barred from considering costs explicitly, does so implicitly. It is nonetheless useful to understand that Superfund is not an aberration in this regard.

The Liability Regime

The liability regime also figures prominently in the reauthorization discussions. PRPs and insurers attack its breadth. In particular, they claim that joint-and-several liability is unfair because it makes solvent PRPs pay for their insolvent counterparts, and that retroactive liability fails to create any desirable incentives. They would prefer nonjoint liability, or, even better, the scrapping of the liability system and its replacement with a tax, ideally a generally applicable tax, to fund cleanups.

The chapter by Lewis Kornhauser and Richard Revesz provides a theoretical analysis of the relative merits of joint-and-several liability as compared with nonjoint liability. They employ three criteria: deterrence, settlement-inducing properties, and fairness. They conclude that, with respect to each of these criteria, neither rule dominates the other. While their analysis proceeds from a simplified economic model and does not explicitly account for the many real-world complications that arise in every Superfund case, its major insights are applicable to more complex situations. Kornhauser and Revesz conclude that the burden is on opponents of joint-and-several liability to justify a departure from the status quo and that they have failed to show that nonjoint liability would be superior.

The chapter by Katherine Probst addresses a similar question from a different perspective. As described above, the trust fund acts as a residual source of funding for cleanups, providing financing at sites where the liability regime fails to raise sufficient money. Thus, for a given set of cleanup standards, any cutbacks on the liability must be counteracted by a tax increase to finance the trust fund. Probst examines the financial impact on various sectors of the economy of three different Superfund policies: the status quo, a waiver of liability for wastes disposed of before 1980 at multiparty sites; and the Clinton administration’s proposal, which, in certain circumstances, would apportion liability shares among PRPs and have the trust fund, rather than the solvent PRPs, pay for the shares of insolvent, though not of unidentifiable, PRPs. Probst finds that the relative percentage of total cleanup costs borne by each industry remains almost constant under each liability option. She estimates that the chemical and allied products industry bears the largest percentage of cleanup costs, about 25%. Even for this industry, however, the burden of Superfund liability is relatively small under any of the alternatives. Probst acknowledges, however, that Superfund expenditures may place a significant burden on some less profitable industries, such as mining and wood preserving, and on individual firms.

Transaction Costs

The Superfund program has been sharply and persistently criticized as involving excessive transaction costs—costs incurred in the process of determining cleanup remedies and imposing financial liability—that do not contribute to the cleanup process. Echoing a widely held sentiment, President Bill Clinton has suggested that more is being spent to enrich lawyers than to clean up the environment, and he invoked this failing as a principal justification for amending CERCLA. It is widely believed that the Superfund program has become mired in endless and costly wrangles among legions of lawyers representing EPA, scores of PRPs, and insurers.
Building on its empirical research on the civil justice system, RAND has gathered data on the transaction costs of Superfund. Lloyd Dixon’s chapter summarizes the results of this research. He finds that private sector transaction costs are indeed significant, ranging from roughly 23% to 31% of all private sector Superfund liability outlays. The data also confirm that transaction costs are much higher at sites with large numbers of PRPs than at sites with one or a few PRPs. Finally, the data show that transaction costs are a much higher percentage of total outlays for PRPs that contributed small shares of waste at a site.

Are Superfund transaction costs excessive? As Dixon points out, the answer depends in part on comparative judgments. As a percentage of total outlays, private sector transaction costs under Superfund are somewhat less than defendant transaction costs as a percentage of outlays in tort litigation generally (35%) and much less than asbestos claim litigation (50%), although higher than airline crash litigation (14%). But are these the right benchmarks for evaluating Superfund?

For one thing, RAND’s research did not examine the transaction costs incurred by the government as plaintiff. In ordinary civil litigation, the plaintiffs’ transaction costs are roughly comparable to those of defendants. In the case of Superfund, however, there is one dominant “repeat player” plaintiff, EPA, which should be able to enjoy substantial scale economies and hence lower transaction costs (To a lesser extent, the same ought to be true for the states or large PRPs, which are the plaintiffs sometimes, though far less frequently.) Accordingly, if plaintiffs’ transaction costs were included in the analysis along with defendant costs, one would expect that total Superfund transaction costs as a percentage of total outlays would be lower, compared to the percentages for tort litigation, than RAND’s figures indicate.

On the other hand, there are good reasons for supposing that Superfund transaction costs should be much lower than the general costs of civil tort litigation. As noted, EPA is the plaintiff in almost every case. Moreover, many disputed issues are resolved through an EPA administrative process, subject to limited judicial review on the administrative record, rather than by de novo civil trial. Finally, the sweeping rules of liability under CERCLA eliminate or minimize the need to resolve many of the factual issues presented in tort litigation, such as fault and causation. All of these factors should result in much lower transaction costs for Superfund. They suggest that an alternative benchmark might be workers’ compensation systems, where the transaction costs of the lowest-cost administrative systems can approach 20% or less, or the social security disability system, where transaction costs are less than 10%. These areas, however, lack the technical or factual complexities that typically arise in Superfund cases. Also, they have well established case law, whereas under Superfund, because of the relative recency of the program, some basic legal issues are still unresolved and must be litigated.

Dixon’s finding that PRPs with a small share of the liability bear a disproportionate amount of transaction costs provides the point of departure for the other chapter in this section: Lewis Kornhauser and Richard Revesz’s study of de minimis settlements—settlements with parties responsible only for a small share of the liability at a site. Congress, aware of this disparity in transaction costs, prescribed in the 1986 SARA amendments that “Whenever practicable and in the public interest,” EPA “as promptly as possible” enter into settlements with de minimis PRPs. Kornhauser and Revesz conducted an empirical study of EPA’s use of de minimis settlements. They found that EPA has vastly underutilized this tool. Even when it has entered into such settlements, it has done so late in the cleanup process, after years of legal wrangling have greatly reduced the benefits of settlement. It has also failed to follow its own policy of standardizing the form of the settlements, thus creating incentives for costly negotiations over the terms of de minimis settlement and for conflict between de minimis and non-de minimis defendants.

Throughout the country, thousands of small businesses are telling essentially the same disparaging tale. Their share of the liability at a site is expected to be only a few thousand dollars, they are prepared to pay a hefty premium to compensate EPA in the event that the initial estimate of remedial costs is too low; and they would like to send EPA a check to settle the case as soon as possible. Instead, they are told to wait, either until all de minimis PRPs have organized into a committee or until the major PRPs are ready to undertake a cleanup. Years go by; the de minimis PRPs feel compelled to have at least some sort of legal representation; legal costs soon overtake their expected liabilities; and their access to credit markets is imperiled.

How can this situation be improved? The answer is not easily determined because EPA already has appropriate settlement tools, and Congress has made reasonably clear its interest in the entry of such settlements; repeating the same thing once again is unlikely to make much difference. Part of the problem is that EPA, as litigant, appropriately concerns itself with maximizing its own expected recovery in litigation and minimizing its administrative costs. As the agency charged with improving social welfare by responding to threats to health and the environment, however, it ought to concern itself with the costs that it imposes on third parties. The problem also stems from EPA’s lack of bureaucratic resources as well as sufficient agency incentives to promote de minimis settlements. Efforts to alleviate the plight of de minimis PRPs will be unsuccessful unless these institutional realities are taken into consideration.
Natural Resource Damages

Attention and debate on CERCLA has focused on liability for cleanups. The natural resource damages (NRD) program is less fully developed, has not resulted in comparable liabilities or litigation, and thus far has not been a significant issue in the reauthorization debate. Nonetheless, NRD liability is a rapidly expanding and potentially quite significant aspect of CERCLA. It must be reckoned with in any comprehensive reevaluation of the Superfund program.

The NRD regime, according to Richard Stewart’s chapter, is a novel blend of tort liability, public trust, and administrative models. Stewart argues that this hybrid system creates significant conceptual, legal, and practical difficulties, including high transaction costs, wasteful expenditures of recoveries, and severe difficulties in developing appropriate measures of damages. One measure of damages is the cost of restoring the injured resource. There is controversy as to whether restoration requires physical and biological replication of the injured resource, which could be enormously costly, or may include trustee acquisition of other resources providing comparable services to the public.

Another measure of damages is the diminished value of the injured resource. The difficulty here is that market measures of value are likely to be quite inadequate as applied to environmentally significant natural resources. Trustee and some economists have sought to base damages on the results of contingent valuation methodology surveys that ask members of the public how much they would hypothetically be willing to pay to preserve or restore a resource. The validity and reliability of this technique is hotly disputed.

The significance of NRD liabilities is likely to grow, as state and tribal as well as federal trustees become more familiar with the program and the possibility of substantial recoveries, which trustees can use to support their operations. Several pending cases seek damages in excess of a billion dollars. It remains to be seen whether the problems identified by Stewart can be resolved with further experience or whether the NRD program will eventually generate demands for changes analogous to those which now attend the cleanup liability regime. Stewart is pessimistic about the performance of the current NRD program and recommends a simplified system of scheduled damages in place of the current tort-based approach, which requires case-by-case proof of injury, causation, and damages.

There is, moreover, a close link between the choice of cleanup standards and the magnitude of NRD liability. To the extent that EPA pursues ambitious cleanup remedies, directed at removing most or all groundwater or soil contamination in the name of environmental protection, it is effectively engaged in restoration of natural resources. If, however, the current reauthorization leads to a significant relaxation of cleanup standards, state and tribal governments could demand costly restoration measures for natural resources under their management or control, thereby undermining the legislative efforts to reduce the cost of the Superfund scheme. It follows, therefore, that efforts to reform the cleanup program should address its interrelationship with the NRD program.

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The issues discussed in this book are complex and do not lend themselves to one-sided treatment. We are convinced that the political process, which will undoubtedly hear many shrill voices, would benefit from paying close attention to the nuanced theoretical and empirical research presented in the chapters of this book.

More importantly, the issues raised here are certain to remain important even after the Superfund statute is eventually reauthorized, regardless of what form the reauthorization takes. This book will thus remain a valuable public policy analysis of what has become one of our most visible and controversial environmental programs.

REFERENCES

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