ENVIRONMENTAL FINANCIAL RESPONSIBILITY

FINAL REPORT

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EXECUTIVE SUMMARY

This study examines environmental financial responsibility programs to determine whether they could be redesigned to have lesser impacts on small businesses while at the same time continuing to achieve their intended goals. To explore this issue, Meridian Research, Inc. first developed a general framework to facilitate the evaluation of financial responsibility programs and to enable conclusions to be drawn and recommendations to be made about the costs and effectiveness of these programs. Meridian then examined the actual experience of major financial responsibility programs to determine if their experiences agreed with those predicted by this framework. Finally, this report discusses a variety of reforms that could be made to specific programs to reduce the costs and impacts of financial responsibility programs on small businesses.

STATEMENT OF THE PROBLEM

Chapter 2 of this report addresses the nature of the problems environmental financial responsibility programs pose for small businesses. Such problems arise when firms are unable to pay either for the environmental damages they have caused or for the expenditures necessary to prevent future environmental damages. Inability-to-pay may occur for either of two reasons.

First, a firm that has adequate assets today may be unable to pay because it has closed or failed before the expenditures are needed. Inability-to-pay for this reason is referred to as a timing problem. Timing problems occur most commonly when expenditures are needed to close a facility properly and when some level of continued expenditure is needed after the facility closes. Requirements for closure and post-closure care for hazardous waste treatment, storage, and disposal facilities (TSDFs) under the Resource Conservation and Recovery Act (RCRA) and requirements for surface mine reclamation under the Surface Mine Control and Reclamation Act (SMCRA) are examples of existing regulations for which timing problems may be important. However, timing problems can occur in any situation in which expenses to remediate or control environmental damages either continue over a long period of time or will not start until some future date.
A firm may also be unable to pay for environmental damages because the damages greatly exceed the assets of the firm. Inability-to-pay for this reason is referred to as a funding problem. Funding problems are particularly likely in the event of releases of toxic substances that can both cause millions of dollars in damages and millions of dollars to control. Requirements for corrective action and payment of third-party liabilities for releases from underground storage tanks (USTs) and from hazardous waste TSDFs are examples of requirements that may lead to funding problems.

The adequacy of solutions for either of these problems is judged in this report by three primary criteria:

- The extent to which the solution provides funds that would not otherwise have been available;
- The extent to which the solution forces firms to internalize the costs of their environmental damages; and
- The extent to which the solution avoids public subsidies to the affected businesses.

GENERAL CONCLUSIONS AND RECOMMENDATIONS CONCERNING POSSIBLE SOLUTIONS

Chapters 3 and 4 of this report address possible financial responsibility mechanisms, the extent to which they can meet the objectives cited above, and the cost and availability of these mechanisms to small businesses. Private sector-provided financial mechanisms include trust funds and related financial instruments, surety bonds, letters of credit, insurance for environmental damages and corrective action, and insurance against business failure. Private-sector mechanisms are covered in Chapter 3. Public sector-provided mechanisms addressed in this report include publicly provided insurance for environmental damages and corrective action, public bond pools, and other arrangements based on fees or taxes either on affected firms or on the general public. Public-sector mechanisms are covered in Chapter 4.

To determine the costs and effectiveness of both private- and public-sector mechanisms, it is useful to distinguish between situations in which expenditures are certain to occur--such as those to provide closure and post-closure care or to pay for environmental
damages that have already occurred--and expenditures for which the need is uncertain--such as potential releases of toxic substances.

Conclusions and Recommendations Concerning Expenditures Certain to Occur

Private financial responsibility mechanisms provide funds if the problem is primarily one of timing. However, private financial responsibility mechanisms over-internalize costs and tend to drive out small businesses, even when the problem is solely one of timing. For example, with a trust fund, small businesses may have to spend $10 to $20 in expenses and fees in order for the Federal government to collect one additional dollar that can be made available to prevent environmental damages.

Consideration should be given to the establishment of a public system in which smaller firms are allowed to put up only a portion of required expenditures and to pay annual fees to a government bond pool. The State of Kentucky has had excellent results with a system of this kind, which was designed to meet financial responsibility requirements for coal mine reclamation.

Private financial responsibility mechanisms can neither provide funds nor internalize costs if the problem is primarily one of funding. To the extent that funding is a potential problem, requirements for private financial responsibility mechanisms tend to be counter-productive and may actually reduce the funds available and encourage inaccurate reporting.

Where funding is a problem, public mechanisms that rely on funds from sources other than the affected business are essential. The State of Florida introduced a model program of this kind for underground storage tank (UST) releases. Under this program, the State paid the costs of corrective action for small gasoline stations that undertook monitoring and discovered releases within a given time frame. This program both encouraged small businesses to undertake monitoring to discover releases very rapidly and enabled small businesses to continue in operation even if they could not pay for corrective action for the releases that were discovered.
Conclusions and Recommendations Concerning Expenditures for Uncertain Events

With expenditures for uncertain events, the situation is different because it is possible to pool risks in order to reduce potential funding problems. The primary mechanism used to pool risks is insurance of various types.

Private financial mechanisms (and particularly private insurance) are unable to serve the small business market consistently. This is true both for risks traditionally regarded as insurable, such as workers' compensation, and for risks that have not traditionally been regarded as insurable, such as most forms of insurance for environmental damages.

Publicly administered financial mechanisms, such as government-provided insurance, assigned risk pools, and public funds (like those set up by many states for corrective actions for USTs) provide adequate funds, internalize costs, and meet the needs of small businesses.

EXISTING FINANCIAL RESPONSIBILITY PROGRAMS

Chapter 5 of this report discusses existing environmental financial responsibility programs in a variety of Federal agencies. Two financial responsibility programs administered by EPA have been in existence long enough to provide useful illustrations of the problems that reliance on private financial responsibility mechanisms can have both with respect to adverse impacts on small businesses and the capacity to provide funds to meet financial responsibility problems. These programs apply to owners/operators of facilities covered under Subtitle C of RCRA, e.g., owners/operators of hazardous waste TSDFs, and owners/operators of USTs regulated under Subtitle I of RCRA. Both of these financial responsibility programs were mandated by Congress. The Subtitle C program made no provision of any kind for public financial responsibility mechanisms. The Subtitle I program included provisions for an UST Trust Fund that could be used for corrective action for abandoned USTs, and contained a provision suggesting that EPA consider State-level public mechanisms as a possible alternative to private-sector mechanisms.

The Subtitle C program imposed a set of very expensive mechanisms that have aided in the solution of timing problems associated with financial responsibility for closure and post-closure care and also imposed a third-party liability requirement during the life of the facility. Small businesses were largely driven out of business by these requirements, and
most remaining TSDF owners/operators are large firms that use a financial test (i.e., a form of self-insurance) to satisfy all financial responsibility requirements. Because even large firms cannot use private financial responsibility mechanisms to address all possible financial responsibility problems, EPA has left a number of gaps in its financial responsibility coverage. For example, there are no financial responsibility requirements and no mechanisms for: (1) covering corrective action at hazardous waste TSDFs, (2) third-party liability after facility closure, or (3) post-closure care beyond 30 years. As a result of these gaps, the few remaining smaller businesses owning hazardous waste TSDFs tend to fail when a serious corrective action occurs at the facility, and EPA has no mechanism for funding such corrective action other than to make them Superfund sites. In this program, a Congressionally imposed attempt to rely entirely on private financial responsibility mechanisms has had the effect of driving small businesses out of the industry while at the same time leaving major funding gaps in the system.

The Subtitle I financial responsibility program has not yet been fully implemented, but it is already clear that the program is having major problems. EPA found that its financial responsibility program would provide less than 10 percent of the funds needed to fund the unfunded portion of UST release costs. At the same time, the program has the potential to drive many small firms out of business because the required insurance is simply not available. In recognition of this problem, EPA has repeatedly postponed the effective date for the UST requirements. Smaller businesses that have been able to satisfy the UST financial responsibility requirements have been able to do so because many States have stepped into the gap and established a variety of public financial mechanisms.

Both of these programs illustrate the potential high cost, high economic impact, and minimal effect on the funding of environmental damages that financial responsibility programs that rely wholly on private sector mechanisms can have.

**ADDITIONAL FACTORS IN REDUCING THE IMPACTS OF FINANCIAL RESPONSIBILITY PROGRAMS**

The final section of this report notes some unrelated reforms that have the potential to alleviate the burdens of financial responsibility programs on small businesses. These reforms include:
• Changing the legal status of EPA with respect to its ability to receive financial responsibility funds;

• Allowing small businesses to use build-up periods for all types of financial mechanisms allowed under EPA’s Subtitle C requirements;

• Changing the tax laws to provide more favorable treatment of trust funds; and

• Elevating the importance of financial responsibility obligations in the deliberations of bankruptcy courts.
CHAPTER 1. INTRODUCTION

Most people would agree that it is appropriate for businesses that cause environmental damages to pay to contain or reverse these damages or to pay for any injury that the business has caused to an innocent bystander. This view reflects the general principle of common law that persons engaging in activities that cause damage to others must pay for these damages. In the environmental area, this principle is enshrined in the "polluter pays" concept, and many Federal, state, and local environmental programs make every attempt to invoke this principle when dealing with environmental releases or other damage-causing events.

In many cases involving environmental issues, however, past experience has shown that it is difficult, if not impossible, to invoke this principle. For example, an underground storage tank may develop a leak long after the site of a former gas station has been paved over, or an aquifer may be discovered to be contaminated by leaking drums at a dump site used by a long-defunct chemical company. The inability to pay for environmental damages may arise in three situations:

(1) When there is uncertainty about the identity of the responsible party, or when the responsible party either cannot be located or no longer exists. This situation is called an abandonment situation.

(2) When the party responsible for the facility causing the damage cannot provide the funds needed to repair the damage because, for reasons unrelated to the incident causing the damage, his/her business has failed. This situation is referred to as a baseline failure. An example of a baseline failure is the bankruptcy of the Pennsylvania Central Railroad, which failed because it could no longer meet its debt obligations.

(3) When the party responsible for the damage cannot provide the funds needed to repair the damage because attempting to pay these costs has caused his/her firm to fail. This situation is referred to as an induced failure. An example of an induced failure is the bankruptcy of the Manville Corporation, which was caused by the third-party liability claims filed against the former asbestos products-producing company.

Environmental financial responsibility programs, i.e., programs designed to ensure that the money to pay for environmental damages will be there when needed, have been established by Federal and state governments specifically to deal with problems such as these.
By ensuring that the "responsible party" has the funds required to pay for any needed repairs, corrective actions, or damages arising from business activities, financial responsibility programs protect the welfare of the public and shield taxpayers from unexpected liabilities. Such programs require the owners of facilities having the potential to cause damage to human health or the environment to use a financial mechanism (insurance, letter of credit, trust fund, financial test of self-insurance, etc.) to demonstrate that they are and will be financially responsible for any damages to the environment or human health caused by releases from their facilities. The facilities concerned are hazardous waste treatment, storage, and disposal facilities, underground storage tanks, municipal solid waste landfills, surface mines, etc.

The objectives of the financial responsibility programs envisioned by Congress are: (1) to ensure that funds are available when needed; and (2) to ensure that firms internalize the costs of environmental protection. However, in mandating these requirements, Congress has made little or no provision to assure that suitable mechanisms for demonstrating financial assurance are available to small businesses, that the assured funds will in fact be readily available if needed, or that the tax treatment of these mechanisms is reasonable and equitable.

This study will show that such environmental financial responsibility programs: (1) create significant and growing inequities for small businesses; and (2) fail to meet the goals Congress intended these programs to achieve. This study will also show that the objectives Congress had in mind can best be addressed by an integrated program that provides for assurance mechanisms that are available to small firms and that allows modifications to be made to Federal statutes to ensure that funds will be available to small firms at reasonable cost.
CHAPTER 2. THE FINANCIAL RESPONSIBILITY PROBLEM

INTRODUCTION

The Resource Conservation and Recovery Act of 1976 was the first piece of Federal environmental legislation to impose financial responsibility requirements for potential environmental damages caused by releases from facilities owned by firms outside the transportation sector. (Financial responsibility requirements for some types of transportation-related spills of hazardous substances had been developed earlier, but these rules affected only a limited number of transportation-related businesses that had good access to financial assurance mechanisms.) Since 1976, financial responsibility requirements have been issued or considered for hazardous waste treatment, storage and disposal facilities; underground storage tanks; municipal solid waste landfills; surface mines; and all facilities storing or transporting substantial quantities of hazardous materials. Exhibit 2-1 shows the major Federal financial responsibility programs and the kinds of environmental events they are designed to address.

Different financial responsibility requirements cover different environmental events. For example, financial responsibility requirements for closure and post-closure care ensure that funds will be available to close a facility properly and to maintain and monitor the facility after it has closed. Requirements for financial responsibility for third-party liability ensure that any party affected adversely by spills or leaks of hazardous substances can recover damages. Requirements for financial responsibility for corrective action require owner/operators to ensure that funds are available to clean up any environmental damages caused by the facility. For coal mines, requirements for financial responsibility for land reclamation are designed to ensure that operators of coal mines revegetate areas where surface mining has taken place. Liability for spills from ships carrying petroleum covers both third-party liability and the costs of clean-up activities resulting from oil spills. Hazardous material transporters are required to meet financial responsibility requirements for third-party claims for bodily injury and property damages and for the costs of environmental restoration when releases of hazardous substances occur. These requirements for hazardous material
## EXHIBIT 2-1. Summary of Existing Federal Financial Responsibility Regulations

<table>
<thead>
<tr>
<th>Governing Legislation</th>
<th>Affected Entities</th>
<th>Financial Responsibility Obligations Addressed</th>
</tr>
</thead>
<tbody>
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<td>Resource Conservation and Recovery Act (RCRA)</td>
<td>Hazardous Waste Treatment, Storage, and Disposal Facilities (Regulated under Subtitle C of RCRA)</td>
<td>Closure; Post-Closure Care; Third-Party Liability</td>
</tr>
<tr>
<td>Resource Conservation and Recovery Act (RCRA)</td>
<td>Municipal Solid Waste Landfills (Regulated under Subtitle D of RCRA)</td>
<td>Closure; Post-Closure Care; Corrective Action</td>
</tr>
<tr>
<td>Resource Conservation and Recovery Act (RCRA)</td>
<td>Owner/Operators of Underground Storage Tanks (Regulated under Subtitle I of RCRA)</td>
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</tr>
<tr>
<td>Resource Conservation and Recovery Act (RCRA)</td>
<td>Owner/Operators of Hazardous Waste Injection Wells</td>
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</tr>
<tr>
<td>Oil Pollution Control Act of 1990 (OPA)</td>
<td>Ships Carrying Petroleum</td>
<td>Liability for Spills</td>
</tr>
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</table>
transporters are thus similar to the third-party liability and corrective action concepts employed in the Resource Conservation and Recovery Act.

This chapter describes the problems that financial responsibility programs are intended to address and discusses the benefits and goals of such programs. Important distinctions among various types of financial responsibility programs are also covered; these distinctions are important in later chapters of this report, which describe approaches to determining the potential effectiveness and impacts of financial responsibility programs of various types.

2.1 STATEMENT OF THE PROBLEM

Several conditions must be met before a financial responsibility problem can be said to exist. First, it must be possible to designate a responsible party for the adverse event. For example, it is relatively easy to designate a responsible party for events such as large releases of toxic materials, but it is virtually impossible to identify the individuals responsible for the "ozone hole." Second, the damages at issue must be capable of being expressed or measured in financial terms.

Three situations in which environmental damages can be translated into financial terms and for which Federal financial responsibility programs have been developed are third-party liability, future corrective actions, and activities designed to prevent future corrective actions. In the first case--third-party damages--the courts assess the magnitude of the damage caused by the business and award the aggrieved third party (i.e., a party who is neither the regulator nor the regulated) monetary damages. In the second case--corrective action to address possible future environmental damage--estimates can be made of the costs that would be necessary to contain the environmental damage. In the third case, activities designed to prevent future corrective actions, estimates can be made of the costs necessary to properly close and maintain care at a site so as to prevent possible future corrective actions. In this report, the term "financial responsibility obligations" is used to refer to an owner's responsibility to protect against third-party liability and future corrective actions.

Financial responsibility problems occur when the responsible firm is confronted with one of the two situations described above and finds itself with insufficient funds to address the problem. This insufficiency may arise either because the firm never had adequate funds
to meet the contingency or because the responsible firm once had the funds but no longer has them. Where the responsible firm never had sufficient funds, the problem is called a **funding** problem; the second case, i.e., where the responsible firm once had sufficient funds but no longer does so, is called a **timing** problem.

Problems of the first type arise when a firm incurs financial responsibility obligations that exceed the value of the firm. For example, a small, aging gasoline station may have total assets of less than $500,000 but could easily incur an obligation in excess of $1 million to repair an underground storage tank leak and might in addition find itself facing a multi-million dollar law suit for third-party damages. Such a business would obviously not be able either to pay for the damage already caused or to undertake the actions necessary to prevent further damage.

Timing problems arise when a responsible firm has adequate funds today to meet its financial responsibility obligations but does not have these funds when they are needed. Funding problems occur most often in situations where financial responsibility obligations are unlikely to arise for a prolonged period of time. For example, the owner of a hazardous waste disposal facility may have more than adequate funds to meet all of the costs associated with operating the facility today but may not still be in business when the disposal unit is full and must be closed in an environmentally protective manner. There is even less chance that such an owner will be in business in the decades following closure, when the need for a minimal amount of post-closure care continues if the closed facility is to avoid becoming an environmental liability.

Other factors that must be considered in designing a financial responsibility program are: (1) whether the financial responsibility obligations have already been incurred, and (2) if they have not already been incurred, the probability that they will be incurred. Three conditions are possible, and these are discussed below.

**Events That Have Already Occurred**

This category covers adverse environmental events that have already occurred by the time a financial responsibility program is implemented. The most common form of this type of problem occurs where a toxic-substance release has taken place prior to the implementa-
tion of the financial responsibility program. Such releases have the potential to cause further
damage unless contained, but their key attribute is that substantial damages have already
occurred before the financial responsibility program is established. Events that have already
occurred do not lead to timing problems but may lead to funding problems.

Events That Are Certain To Occur But For Which Expenditures Are Not Yet Necessary

For many situations, no environmental damage will have occurred to date and none
will occur in the future if the responsible party makes adequate preventive expenditures at the
right time. The most common example of this type of financial responsibility problem is the
need to ensure adequate closure of many types of facilities, and, in some cases, to provide
continuing care of the site for some period after the closure. Examples of this type of prob-
lem are: clean up and removal of all toxic wastes from hazardous waste treatment facilities
at the time of closure; provision for continuing care of landfills containing toxic wastes after
closure; and the reclamation of surface mines after they are closed. In these situations, both
timing and funding problems may occur.

Uncertain Events

Many types of events that may cause environmental damages are highly uncertain
with respect both to the timing and cost of the occurrence. The most common event of this
type is a potential future release of toxic substances. In addition, uncertain events may take
place during the business life of a company or after the business has closed. Most types of
toxic releases are the result of normal business activities during the life of a company; how-
ever, hazardous waste disposal facilities, in which waste remains in the ground following the
business life of the facility, have the potential for releases even after the business has closed.
In these situations, both timing and funding problems may occur.

2.2 BENEFITS OF FINANCIAL RESPONSIBILITY PROGRAMS

The section above described the nature of the financial responsibility problem. This
section discusses the benefits these programs can achieve, i.e., the problems they are de-
signed to avoid. There are three major problems that financial responsibility programs can
help to avoid: delays in identifying a source of funding; failure of a firm to take adequate care; and financial distortions.

Expenses and Delays in Finding Another Party to Pay for the Problem

If the person responsible for the environmental problem cannot pay to remedy it, some delay in the implementation of corrective actions will take place while alternative funds are found. In addition, looking for other sources of funding can be expensive, which adds to the overall financial outlay. In some cases, delays are not an issue; however, they can cause a serious problem if the environmental damage will increase if adequate funds are not expended immediately. Financial responsibility programs address the delay-in-funding problem because they ensure that delays are minimal.

Inadequate Care in Preventing and Limiting Damages

A firm that knows it will not have to pay for the full costs, including damages, of its actions does not have the same incentive to pay for adequate care to prevent damages as a firm that knows it will incur these costs. The most extreme case of this problem arises in situations in which the firm believes it will not have to pay damages at all. For example, there is no incentive for a firm to take care to avoid damages that might occur after the firm goes out of business. The problem of inadequate care also arises in situations involving low probabilities of very expensive events. For example, consider the situation in which an event with a probability of .01 percent and costing $10,000,000 could be prevented by spending $60,000. From a social viewpoint, the expected value of the damage is $100,000 (.01 times $10,000,000), while the cost of prevention is $60,000, for a net benefit of $40,000 ($100,000 minus $60,000). A firm with only $200,000 to lose, however, would be tempted not to make this expenditure, even though incurring this cost is clearly in the interest of society. For a firm with only $200,000 to lose, the expected value of the damage is $20,000 (.01 times $400,000), and the cost of prevention is still $60,000, for a net loss of $40,000. Again, financial responsibility programs ensure that the firm, however unwilling, will opt for the socially advantageous solution.
Financial Distortions

In the absence of financial responsibility regulations, firms entering an industry in which there are serious potential liabilities have a major incentive to financially structure the firm in a way that minimizes these problems. For example, in a situation in which there is a serious risk of large potential liabilities, the ideal financial structure is one that limits the assets actually held by the firm to the absolute minimum necessary to conduct business and to siphon off all profits to the owners as quickly as possible. It is also advantageous to set up as many separate corporate entities as possible, so as to minimize the risks to any one entity. For example, an entity owning a fleet of nitroglycerin-carrying trucks, would, if it could, set up a separate mini-company for each truck, which would enable the mini-company to declare bankruptcy in the event of a serious accident; in this extreme example, the larger entity would still retain control over all of the other mini-companies owning the other trucks. A number of financial set-ups are possible to try to limit a firm's liability; the most common are: (1) creating as many companies as possible; (2) owning multiple entities through separate holding companies; (3) selling a troubled company for a low price to an under-financed entity; and (4) closing companies that have potential liabilities but no remaining assets. These financial distortions are not purely theoretical, i.e., all of these arrangements have actually been observed among firms owning toxic waste disposal sites. Such distortions are both expensive and inefficient from a social viewpoint and serve to increase the likelihood that funding delays and difficulty in assigning responsibility will occur.

2.3 QUANTIFIABLE GOALS OF FINANCIAL RESPONSIBILITY PROGRAMS

Financial responsibility programs should be designed to solve all three of these problems: delays in funding; failure of firms to take adequate preventive measures; and financial distortions. This study will use two quantifiable measures to examine the extent to which a given financial responsibility program solves the problems posed; these measures are described below.

1. **Extent to which the costs of environmental damages are internalized.** Costs are said to be internalized when the costs incurred by a business to pay for potential environmental damages are equal to the full social costs of these damages. The best measure of the
extent to which the costs of environmental damages have been internalized is to compare (a) the costs of environmental damage that businesses without a financial responsibility program have been unable to pay, and (b) the costs businesses with a financial responsibility program have been able to pay. If these two figures are in reasonably close agreement, the financial responsibility program has probably been successful in assuring adequate care to prevent and limit damages and will help to avoid financial distortions. However, if the costs of environmental damages to businesses are significantly less than the social costs of such damages, then the financial responsibility program will not alleviate many of the problems it was designed to resolve. On the other hand, if the costs to businesses, and particularly to small businesses, are greater than the social costs, then the program is over-internalizing costs, which will discourage small businesses from entering the field.

2. **Availability of funds for environmental purposes that would not otherwise have been available.** One major purpose of financial responsibility programs is to ensure the availability of funds when needed so that timely remediation can take place. To determine the performance of financial responsibility programs with respect to this objective, it is necessary to estimate the funds that would have been available in the absence of the financial responsibility program and to determine the proportion of these funds that the financial responsibility program will provide. Success in meeting this purpose will avoid expenses and delays in finding other parties to pay for a problem.

Financial responsibility programs can do well with respect to one of these goals and fail to meet the other goal at all. For example, a fund based on general revenues can assure that funds are always available when needed without providing any incentive toward cost internalization.

**SUMMARY**

The next two chapters examine various financial responsibility mechanisms with respect to the types of problems each kind of mechanism can address, and evaluate how well these mechanisms can meet the goals set out here for financial responsibility programs.
CHAPTER 3. PRIVATE MECHANISMS

INTRODUCTION

This chapter describes the financial mechanisms available for firms to use to provide assurance of their ability to meet their environmental financial responsibility obligations; it focuses on those financial mechanisms that are available through the private sector. (The next chapter discusses financial mechanisms that may be made available through the public sector, i.e., through the States or Federal government.) For each type of private-sector financial mechanism, the following factors are considered:

• How the mechanism functions, what administrative problems it poses for the administering agency, and examples of the mechanism's use;

• The kinds of financial responsibility problems the mechanism can address (e.g., problems of timing, funding);

• The availability of the mechanism to small businesses and the costs it imposes on such businesses;

• The extent to which the mechanism forces businesses to internalize the potential costs of their environmental obligations; and

• The extent to which the mechanism acts to provide funds that would not otherwise be available.

3.1 TYPES OF PRIVATE-SECTOR FINANCIAL RESPONSIBILITY MECHANISMS

There are two general categories of private-sector financial responsibility mechanisms (see Exhibit 3-1):

• Those whose funds derive from the responsible firm itself; and

• Those whose funds are derived from an independent party.

The simplest mechanisms of the first type are those that require the responsible firm to maintain a certain minimum amount of capital and to meet certain other financial requirements that are designed to ensure the long-term viability of the firm. In the context of environmental financial responsibility requirements, mechanisms of this type are called financial tests (they are also called self-insurance, self-bonding, or minimum capitalization mechanisms).
## EXHIBIT 3-1. Private-Sector Financial Assurance Mechanisms

<table>
<thead>
<tr>
<th>Mechanisms Whose Funds Derive From the Responsible Party</th>
<th>Mechanisms Whose Funds Derive From An Outside Party</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Tests (also called Self-Insurance, Self-Bonding, and Minimum Capitalization)</td>
<td>Surety Bonds</td>
</tr>
<tr>
<td>Secured Interests, e.g., Pledges and Liens</td>
<td>Stand-by Letters of Credit</td>
</tr>
<tr>
<td>Trust Funds</td>
<td>Insurance</td>
</tr>
<tr>
<td>Escrow Accounts</td>
<td></td>
</tr>
<tr>
<td>Other Special Accounts</td>
<td></td>
</tr>
</tbody>
</table>
Firms that use a financial test to insure their own potential environmental obligations set the funds designated for this purpose aside in a separate account but continue to have access to them. Financial tests are discussed in detail in Section 3.3.

Other financial mechanisms that depend on the funds of the responsible firm are secured interests, trust funds, escrow accounts, and other special accounts. These mechanisms provide the agency administering the financial responsibility program with greater assurance that funds will be available when they are needed than is the case for financial tests, because, in all of these cases, the firm's funds are sequestered, i.e., are isolated from the firm's other funds. Section 3.4 discusses the various types of mechanisms that fall into this category in detail.

Many different financial assurance mechanisms fall into the second broad category of private-sector mechanisms, i.e., those that derive their funding from an independent party rather than from the responsible firm. These mechanisms all offer an independent party who is willing to take the risk of assuming another's financial responsibility obligations the opportunity to make a profit. One of the ways independent parties can make a profit from financial responsibility transactions is by agreeing to guarantee that the necessary funds will be available if and when needed. With all mechanisms of this type, the independent party charges the firm to set up a mechanism that ensures the availability of funds if an environmental obligation arises. The most common examples of such guarantees are surety bonds and stand-by letters of credit, which are discussed further in Section 3.5.

In situations in which it is difficult either to predict when, or if, a firm might have to pay out to address an environmental liability, independent parties can make a profit by taking advantage of the fact that the expected value of uncertain financial responsibility obligations is often significantly less than the total value of that obligation. In other words, the independent party can charge the responsible firm for the expected value of the uncertain environmental event and in addition charge the firm for expenses, administrative fees, and profit. Private financial assurance mechanisms of this type are called insurance. This financial mechanism is discussed further in Section 3.6.
3.2 FINANCIAL TESTS OF SELF-INSURANCE

Financial tests of self-insurance can be used only by a small number of firms, because a firm's ability to use this financial mechanism depends on the firm's net worth. That is, firms that do not have a substantial net worth are not considered good enough risks to use self-insurance as a mechanism for assuring their environmental obligations. Financial tests also pose problems for the administering agency, because net worth--the difference between the value of a firm's assets and its liabilities--is difficult to determine. This is the case because a firm's assets take a variety of forms, including cash, debts owed to the firm, inventory (goods and services not yet sold), and real property, and a firm's liabilities, which are basically obligations to pay others, also vary from day to day. Although accountants have developed a variety of conventions to deal with these financial realities, net worth--the difference between the accounting valuation of assets and liabilities--cannot be used as an index of the firm's actual ability to pay. In addition, the value of an ongoing firm is considerably different from that of a firm that is about to close. If a firm must close, only its liquidation value--the value for which the individual assets of the firm could be sold--is relevant, and liquidation values are normally only a fraction of ongoing firm values.

To minimize these uncertainties as much as possible, and to avoid excessive administrative burdens for the administering agency, financial tests that are a part of environmental financial responsibility programs list a set of specific financial criteria that a firm must meet before it can use a financial test of self-insurance to assure its environmental obligations. These criteria are specifically selected to provide the agency with a reasonable degree of assurance that a firm passing the test will in fact be able to provide the funds when needed. (Exhibit 3-2 shows some financial tests that EPA has used for various purposes.) However, no financial test is perfect, and EPA estimates that the various financial tests it has used have a "failure" rate of between 0.2 and 1 percent per year, i.e., that between 0.2 and 1 percent of all firms using the financial test of self-insurance will go bankrupt and will therefore not be able to meet their environmental obligations when the time arises.
EXHIBIT 3-2. Financial Tests Used in Existing Financial Responsibility Programs

<table>
<thead>
<tr>
<th>FINANCIAL RESPONSIBILITY Obligation</th>
<th>FINANCIAL TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subtitle C—Closure and Post-Closure Care</td>
<td>The owner/operator must have:</td>
</tr>
<tr>
<td></td>
<td>(1) Two of the following three ratios:</td>
</tr>
<tr>
<td></td>
<td>Ratio of total liabilities to net worth less than 2.0; ratio of the sum of net income plus depreciation, depletion, and amortization to total liabilities greater than 0.1; and a ratio of current assets to current liabilities greater than 1.5; and</td>
</tr>
<tr>
<td></td>
<td>Net working capital and tangible net worth each at least six times the sum of the current closure and post-closure cost estimates and the current plugging and abandonment cost estimates; and</td>
</tr>
<tr>
<td></td>
<td>Tangible net worth of at least $10 million; and</td>
</tr>
<tr>
<td></td>
<td>Assets located in the United States amounting to at least 90 percent of total assets or at least six times the sum of the current closure and post-closure cost estimates and the current plugging and abandonment cost estimates, OR</td>
</tr>
<tr>
<td></td>
<td>(2) A current rating for his/her most recent bond issuance of AAA, AA, A, or BBB as issued by Standard and Poor’s, or Aaa, Aa, A, or Baa as issued by Moody’s; and</td>
</tr>
<tr>
<td></td>
<td>Tangible net worth at least six times the sum of the current closure and post-closure cost estimates and the current plugging and abandonment cost estimates; and</td>
</tr>
<tr>
<td></td>
<td>Tangible net worth of at least $10 million; and</td>
</tr>
<tr>
<td></td>
<td>Assets located in the United States amounting to at least 90 percent of total assets or at least six times the sum of the current closure and post-closure cost estimates and the current plugging and abandonment cost estimates.</td>
</tr>
</tbody>
</table>
EXHIBIT 3-2. Financial Tests Used in Existing Financial Responsibility Programs (continued)

<table>
<thead>
<tr>
<th>FINANCIAL RESPONSIBILITY OBLIGATION</th>
<th>FINANCIAL TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subtitle C—Third Party Liability</td>
<td>The owner/operator must have:</td>
</tr>
<tr>
<td></td>
<td>(1) Net working capital and tangible net worth each of at least six times the amount of liability coverage to be demonstrated by this test; and</td>
</tr>
<tr>
<td></td>
<td>Tangible net worth of at least $10 million; and</td>
</tr>
<tr>
<td></td>
<td>Assets in the United States amounting to either: (a) At least 90 percent of his/her total assets; or (b) at least six times the amount of liability coverage to be demonstrated by this test, OR</td>
</tr>
<tr>
<td></td>
<td>(2) A current rating for his/her most recent bond issuance of AAA, AA, A, or BBB as issued by Standard and Poor’s, or Aaa, Aa, A, or Baa as issued by Moody’s; and</td>
</tr>
<tr>
<td></td>
<td>Tangible net worth of at least $10 million; and</td>
</tr>
<tr>
<td></td>
<td>Tangible net worth at least six times the amount of liability coverage to be demonstrated by this test; and</td>
</tr>
<tr>
<td></td>
<td>Assets in the United States amounting to either: (a) At least 90 percent of his/her total assets; or (b) at least six times the amount of liability coverage to be demonstrated by this test.</td>
</tr>
<tr>
<td>FINANCIAL RESPONSIBILITY OBLIGATION</td>
<td>FINANCIAL TEST</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Subtitle I--Corrective Action and Third Party Liability</td>
<td>The owner/operator must:</td>
</tr>
<tr>
<td></td>
<td>(1) (a) Have a tangible net worth of at least 10 times:</td>
</tr>
<tr>
<td></td>
<td>1 The total of the applicable aggregate amount required, based on the number of underground storage tanks for which a financial test is used to demonstrate financial responsibility;</td>
</tr>
<tr>
<td></td>
<td>2 The sum of the corrective action cost estimates, the current closure and post-closure care cost estimates, and amount of liability coverage for which a financial test is used to demonstrate financial responsibility; and</td>
</tr>
<tr>
<td></td>
<td>3 The sum of current plugging and abandonment cost estimates for which a financial test is used to demonstrate financial responsibility; and</td>
</tr>
<tr>
<td></td>
<td>(b) Have a tangible net worth of at least $10 million; and</td>
</tr>
<tr>
<td></td>
<td>(c) Have a letter signed by the chief financial officer worded as specified; and</td>
</tr>
<tr>
<td></td>
<td>(d) Either</td>
</tr>
<tr>
<td></td>
<td>1 File financial statements annually with the U.S. Securities and Exchange Commission, the Energy Information Administration, or the Rural Electrification Administration; or</td>
</tr>
<tr>
<td></td>
<td>2 Report annually the firm’s tangible net worth to Dun and Bradstreet, and Dun and Bradstreet must have assigned the firm a financial strength rating of 4A or 5A, OR</td>
</tr>
<tr>
<td></td>
<td>(2) Meet the financial test requirements in 40 CFR 264.147(f)(1) (Financial test for third party liability for Subtitle C facilities).</td>
</tr>
</tbody>
</table>
EXHIBIT 3-2. Financial Tests Used in Existing Financial Responsibility Programs (continued)

<table>
<thead>
<tr>
<th>FINANCIAL RESPONSIBILITY OBLIGATION</th>
<th>FINANCIAL TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Mining--Self-Bonding</td>
<td>The applicant must:</td>
</tr>
<tr>
<td></td>
<td>Have been in continuous operation as a business entity for a period of not less than 5 years (immediately preceding the application); and</td>
</tr>
<tr>
<td></td>
<td>(1) Have a current rating for its most recent bond issuance of A or higher as issued by either Moody's Investor Service or Standard and Poor's Corporation, OR</td>
</tr>
<tr>
<td></td>
<td>(2) Have a tangible net worth of at least $10 million, a ratio of total liabilities to net worth of 2.5 or less, and a ratio of current assets to current liabilities of 1.2 or greater, OR</td>
</tr>
<tr>
<td></td>
<td>(3) Have fixed assets in the United States totaling at least $20 million, and a ratio of total liabilities to net worth of 2.5 or less, and a ratio of current assets to current liabilities of 1.2 or greater.</td>
</tr>
</tbody>
</table>
Kinds of Problems Financial Tests of Self-Insurance Can Address

Unlike most of the other financial mechanisms discussed below, financial tests are not designed to solve environmental financial responsibility problems of the funding or timing kind (as described in Chapter 2). Instead, financial tests should be thought of as mechanisms for identifying those firms whose financial strength is such that they will be able to handle almost any foreseeable environmental obligation.

Availability and Costs of Financial Tests to Small Businesses

Financial tests cannot be used by any firm that is too small to meet the financial criteria imposed by the test. As can be seen from Exhibit 3-1, virtually all of the tests used by Federal agencies to date have minimum capitalization requirements (i.e., net worth or minimum assets requirements) of millions of dollars. In addition, the reporting requirements associated with the use of such tests are very costly. For example, all of EPA's financial tests require an independent audit of the firm's financial data. All publicly held firms, and most large privately held firms, are independently audited, but few small businesses have the funds to pay for a full independent audit, which can cost from $20,000 to $60,000 a year, depending on the size of the firm and its financial complexity.

Degree to Which Financial Tests Achieve Cost Internalization

The degree to which the use of a financial test forces a firm to internalize the costs of its potential environmental obligations depends on: (1) the probability that a firm passing the test will subsequently go bankrupt, and (2) when the environmental obligation covered by the test arises, i.e., on its timing. For example, a financial test that has a predicted failure rate of 1 percent and that is used to insure an event that has already occurred and must be paid off within a year will force a firm to internalize 99 percent of these costs. However, if the same mechanism is used to self-insure an event that will occur 30 years from now, the firm will only internalize 73 percent of the costs of the event (see Appendix A for calculations). The influence of the timing of the self-insured event on the extent to which costs are internalized explains why EPA requires more stringent financial tests for environmental events that have not yet occurred.

3-9
Ability of Financial Tests to Ensure the Availability of Funds

Financial tests do not increase or decrease the level of funding available to address an environmental obligation, and this evaluation factor is thus not relevant to financial tests of self-insurance.

3.3 PRIVATE FINANCIAL RESPONSIBILITY MECHANISMS BASED DIRECTLY ON THE RESPONSIBLE FIRM'S OWN FUNDS

The extent to which agencies should feel comfortable allowing firms to use a financial assurance mechanism depends to a large extent on how well the mechanism will work if the firm declares bankruptcy. In bankruptcy, a hierarchy of creditors prevails, i.e., the debts of some creditors are assigned a higher priority than others. For example, the Internal Revenue Service is a first-line creditor, and creditors who have secured interests come before those whose interests are not secured by some form of collateral. Traditionally, a firm's environmental obligations are accorded a low priority in this hierarchy. For example, the obligation to pay a third-party liability claim—such as damages awarded to a plaintiff for adverse health effects caused by exposure to an environmental hazard—usually has a low priority because: (1) the obligation was only recently incurred, and (2) unsecured debts (such as obligations to restore the environment) generally rank below conventional financial debt on the hierarchy of creditors. Financial responsibility mechanisms elevate the position of environmental obligations on the hierarchy of creditors because they provide a mechanism that acts much like a secured interest.

Several financial mechanisms that can be used to assure a firm's potential environmental obligations rely for funds on the firm's own resources; these include secured interests, pledges and liens, trust funds, escrow accounts, and a variety of other mechanisms. These are discussed further below.

Secured Interests

A secured interest is a mechanism designed to allow certain assets to be used as collateral for some specific purpose. The function of secured interests is to allow the secured party to seize the assets of a firm that has failed to pay its debt without having to go through the legal and administrative problems involved in bankruptcy. If a firm declares bankruptcy,
the claims of parties with secured interests are assigned a higher priority than the claims of parties with unsecured interests. Secured interests provide creditors with greater assurance that a debt will be paid; their advantage to the debtor is that they allow him or her to obtain loans that might not otherwise be available, and to do so at a lower interest rate than would otherwise be available. Pledges and liens are the most common forms of secured interest. A pledge assigns an asset as security for a loan. A lien is a right given to a party to control or retain and enforce a charge against the property of another until some claim of the former is paid or satisfied. Liens are used by the Office of Surface Mining to assure that firms will assume the financial responsibility for reclamation after surface mining activities have been completed. However, EPA has not allowed pledges and liens to be used as financial assurance mechanisms because of the administrative complexities involved in estimating the value of assets and in obtaining and maintaining legally valid pledges and liens.

**Trust Funds**

A trust fund is an agreement between three parties: the trustor, the trustee, and the beneficiary. Under this mechanism, the grantor (or "trustor") transfers the secured legal assets to a second party, the trustee, who manages the assets for a third party, the beneficiary. When used as an environmental financial assurance mechanism, the grantor is the responsible firm, the beneficiary is the environmental agency, and the trustee is most commonly a bank. The trust fund itself is a trust agreement that typically names the parties, explains their responsibilities and duties, and describes how much remuneration is to be paid to the trustee, how funds are to be invested, and how and when the beneficiary is to be paid. In the environmental context, funds from the trust are paid out when environmental obligations arise that the firm is unable to meet. If the responsible firm subsequently becomes able to meet its environmental obligations, the money in the trust fund reverts to the ownership of the firm. Thus trust funds serve to isolate a firm’s funds in such a way that neither the firm nor other creditors can access them.
Other Types of Accounts

In addition to trust funds, there are a number of other types of accounts that can be set up to allow a responsible party to assure funds to meet certain financial responsibility obligations. Escrow accounts are designed to hold funds for a relatively short time; this mechanism places fewer management obligations on the party holding the escrow account than is the case for trust funds. In principle, any type of private account can be set up in the name of the agency requiring financial assurance, with the agreement that the funds will revert to the responsible party when and if all of the firm’s financial responsibility obligations have been met. Private accounts of this kind are allowed to serve as a form of collateral bond by the Office of Surface Mining, where they are used to assure reclamation in the context of surface mining.

Kinds of Problems Mechanisms of This Type Are Designed to Address

By their very nature, private mechanisms that are directly dependent on the funds of the responsible firm cannot be used to solve funding problems, i.e., problems involving an insufficiency of funds. In other words, if a firm does not have adequate funds to meet a financial responsibility obligation, it will not have an asset that has sufficient value to serve as a secured interest, and it will certainly not be in a position to place assets equal in value to its financial responsibility obligations in a trust fund or other private account.

Secured interest mechanisms are primarily designed to solve potential timing problems. By securing or setting aside funds today, they assure funds will be available in the future even if the responsible firm is forced out of business.

Availability and Costs of Mechanisms of This Type to Small Businesses

Setting up a mechanism that is directly dependent on the funds of the firm and is sizable enough to cover the full value of a firm’s financial responsibility obligation is difficult for smaller firms. That is, a small business that cannot meet the full value of its environmental obligation will also not be able to set aside funds for this purpose.

Mechanisms that operate on the secured interest principle also are associated with two types of costs: opportunity costs and management fees. Opportunity costs are the costs
incurred as a result of using the firm’s assets to satisfy financial responsibility requirements instead of using them for other purposes. The opportunity cost of a secured interest tends to be lower than the opportunity costs of other private mechanisms that can be used to assure environmental obligations. For example, the opportunity cost of a secured interest is merely the difference between the costs incurred to obtain a loan secured by this same asset and the costs incurred to obtain the secured interest. Opportunity costs for trust funds and other kinds of private accounts, however, tend to be much higher, because the opportunity costs for these accounts represent the difference between what the responsible firm could earn if it invested these funds and what the funds earn in the trust fund, escrow account, or other private account. In general, this difference in earnings is substantial, ranging from 2 to 10 percent of the value of the funds, depending on how the funds are invested and the tax treatment of the income from the funds.

Management fees for secured interests and other private accounts vary both with the size and the type of account. Banks typically charge a minimum rate of $500 to $1,500 per year and, for larger trust funds, a fee of 0.5 to 1.5 percent per year on the value of the fund. Management fees for escrow and other private accounts can be much lower because management takes little or no responsibility for managing these funds.

Degree to Which Mechanisms of This Type Achieve Cost Internalization

Trust funds virtually assure that firms using them will completely internalize the costs of their real or potential environmental obligations; however, trust funds often lead a firm to overinternalize these costs, i.e., the costs associated with the trust fund may greatly exceed the costs of the obligations being assured. This effect occurs in two situations: when the obligation being assured is remote in time, or when it is uncertain. How such overinternalization occurs is described in the following two examples. Suppose a firm with a failure rate of 0.4 percent per year uses a trust fund that imposes fees of 1.5 percent per year, and that the opportunity cost of capital is 2 percent per year and the discount rate is 3 percent per year. Using these assumptions and assuming that the environmental obligation being assured is certain to occur but will not do so for 20 years, the trust fund will cost the firm over $8 for every $1 in obligation that it could not have covered without the trust fund.
Under the assumptions given, there is a 92 percent chance that the firm will have the funds available to meet its costs and an 8 percent chance that the firm will fail and be unable to meet its costs. Thus the value of the uncovered liability will be $0.08 per dollar of financial responsibility obligations. In order to assure that this $0.08 per dollar is available if needed to meet the firm's financial responsibility obligations 20 years from now, the firm will have to spend a present value $0.22 per dollar of financial responsibility obligations on trust funds, and will, in addition, lose a present value of $0.47 per dollar due to the difference between the return on funds in a trust fund and what the firm could earn on other investments. The situation can be even worse when trust funds are used to cover uncertain events. If the same assumptions are used but the event being assured is highly unlikely to occur (e.g., has a probability of 0.01 percent), the trust fund will cost $875 for every $1 of uncovered financial responsibility obligation. Thus trust funds and other instruments that operate on the same principle are an extremely costly way of assuring cost internalization and often lead to overinternalization; as mentioned above, overinternalization discourages small businesses from entering industries that are associated with potential financial responsibility obligations.

Ability of Mechanisms of This Type to Ensure Availability of Funds

Most mechanisms that are based on the funds of the responsible firm are designed to assure that funds will be available when needed; this is the case for trust funds, escrow accounts, and other private accounts. With secured interests, however, this may not be the case, both because the value of the assets secured may be inadequate and because, in some circumstances, other parties in a bankruptcy suit may have access to these assets. In addition, there are circumstances where trust funds, because of their high costs and stringent funding requirements, may actually act to limit, rather than increase, the amount of funds available. For example, under EPA financial responsibility rules, a corrective action that requires an annual outlay of $25,000 for each of 8 years would require a firm to assure a financial responsibility obligation for the total amount, i.e., for $200,000 (8 X $25,000). Requiring firms to assure the full amount all at one time, rather than to assure the annual amount over a prolonged period, would drive many firms out of business and thus actually
reduce the funding available to address the problem. Trust funds are also counterproductive in situations where the firm could pay for the environmental obligation but not for the obligation plus the costs (e.g., management fees, opportunity costs) associated with trust funds. EPA recognizes that traditionally designed trust funds may be counterproductive and allows responsible firms a gradual trust fund build-up period when such funds are used to meet financial responsibility obligations for closure and post-closure care under Subtitles C and D of RCRA. However, even with a build-up period, the costs of trust funds may be large enough to have undesirable effects.

3.4 GUARANTEES

When an agency receives a guarantee, it no longer needs to concern itself with protecting the funds of the responsible firm because, even in a bankruptcy situation, the agency can collect the funds necessary to cover the environmental obligation directly from the guarantor. There are two types of guarantees that may be useful to small businesses: surety bonds and letters of credit.

Surety Bonds

A surety bond is a contract of suretyship, typically involving the assumption of liability by one party, called the surety or guarantor, for the obligation of another party, called the principal or obligor, to a third party, called the obligee or beneficiary. In a surety bond, the surety states the conditions under which it agrees to protect the beneficiary against default on the part of the principal. The surety bond also establishes a penal sum, which is the maximum extent of the surety's monetary liability. When used for financial responsibility obligations, the responsible firm is the principal, the company listed in Department of Treasury Circular 570, "Surety Companies Acceptable on Federal Bonds," is the surety, and the agency is the beneficiary. Surety bonds may take one of two forms. A performance bond obligates the surety to undertake the activity the principal should have undertaken, e.g., in the environmental context, to conduct closure or post-closure care. A financial guarantee bond obligates the surety to pay the beneficiary the value of the financial responsibility obligation. Whether a given firm can obtain a surety bond depends on the credit-worthiness
and funds of the firm. A surety will only issue a surety bond if (1) it is completely confident that the responsible firm will have the funds to meet the financial responsibility obligation, or (2) if the firm provides suitable collateral that the surety can collect against if the responsible firm defaults. Virtually all existing environmental financial responsibility programs allow responsible firms to use surety bonds to assure their environmental obligations.

Letters of Credit

A letter of credit is an instrument issued by a bank or another financial institution, called the opening bank or issuer, on behalf of its customer, called the account party or customer, which gives a third party, called the beneficiary, the right to draw funds from the issuing institution on presentation of the documents specified in the letter of credit. In the case of letters of credit used for financial responsibility purposes, the issuer is a bank, the customer or obligee is the responsible firm, and the beneficiary is the agency. Banks issue letters of credit only under circumstances similar to those under which they would grant a loan to the firm. The bank must be confident that the firm will (1) be able to pay the full value of the environmental obligation, or (2) provide collateral the bank can collect against in the event of default by the responsible firm. Virtually all existing financial responsibility programs allow the use of letters of credit.

Kinds of Problems Guarantees are Designed to Address

Because both surety bonds and letters of credit are issued only to firms deemed to have adequate funds or collateral to meet their financial responsibility obligations, these mechanisms cannot solve funding problems, i.e., an insufficiency of funds. However, both mechanisms are useful for dealing with timing problems.

Availability and Costs of Guarantees to Small Businesses

Guarantees such as surety bonds and letters of credit are of limited value to smaller firms that are attempting to meet their financial responsibility requirements. For example, they cannot be used at all when the magnitude of the potential financial responsibility obligation exceeds the funds available to the firm. Even when a firm has adequate funds, surety
bonds and letters of credit are not available unless the firm posts collateral equivalent in value to the financial responsibility obligation being assured. Posting collateral in this amount usually has significant opportunity costs for small businesses, which normally have difficulty obtaining loans at all. For larger businesses, posting collateral is much simpler. For example, most banks will issue a letter of credit for up to $1 million to a customer who maintains an account worth $1 million at the bank, in return for the right to seize the account if the agency collects on the letter of credit.

The size of the fees associated with surety bonds and letters of credit are similar. Annual fees run from 0.3 to 2 percent per year of the value of a letter of credit, and some banks may also charge minimum fees. Surety bonds also have annual fees ranging from 0.25 percent to 2 percent of the value of the penal sum. The Surety Association of America has issued a standard "manual" rate for financial guarantee bonds under Subtitle C of RCRA of $20 per $1,000 of coverage per year (i.e., 2 percent).

Degree to Which Guarantees Achieve Cost Internalization

For both surety bonds and letters of credit, cost internalization issues are similar to those for trust funds; that is, the extent to which these mechanisms result in cost internalization depends on the timing and uncertainty of the environmental events being assured. Ignoring the opportunity costs of capital, which tend to be lower for letters of credit and surety bonds, and considering only fees, the costs to small businesses of assuring a financial responsibility obligation occurring 20 years in the future can be $7 for every dollar made available that would otherwise not have been available. The costs to a small business of assuring a highly uncertain event (i.e., one with a probability of 0.01) can be $200 per dollar of funds made available.

Ability of Guarantees to Ensure Availability of Funds

Letters of credit are extremely secure mechanisms that virtually ensure that funds will be available when needed. However, surety bonds, and especially performance bonds, are subject to a claims adjustment process that may not leave the agency's claims fully satisfied. Both mechanisms are subject to the same dangers as trust funds, i.e., that the timing of the
occurrence of the assured event or the costs associated with the mechanism could actually serve to reduce the amount of funds available in the case of marginal firms.

3.5 INSURANCE

In the legal sense, insurance is a contractual arrangement in which one party, called the insurer, agrees to compensate another party, called the insured, for losses. The payment the insurer receives is called a premium, and the insurance contract is called a policy. By purchasing insurance, the insured transfers his/her risk to the insurer. The insurer does not merely stand behind the insured, as is the case with guarantees, but actually replaces the insured. An insurance policy is, in general, a much more complex instrument than a trust agreement or surety agreement. An insurance policy includes the limits of the policy, declarations of the insured, exclusions, and conditions, all of which serve to limit the liability of the insurer. Declarations are statements by the insured concerning factual matters; for example, a life insurance policy includes declarations concerning the age and known health conditions of the insured, and an automobile insurance policy contains a description of the vehicle insured. In general, if the insured gives false information in the policy’s declarations or in an insurance application, and the answers are material to the risk, the insurer has the right to void the insurance contract. Exclusions are designed to exempt certain kinds or types of losses from coverage. For example, property insurance commonly excludes damages caused by war or flood. In some cases, exclusions can be covered by other types of policies; in other cases, they may be uninsurable. Conditions cover the general rules according to which a policy functions. For example, conditions may contain information about when premiums are to be paid, when coverage begins and ends, how claims are to be made, the duties of the insured after a loss, etc. Failure of the insured to meet the conditions of the policy may reduce or eliminate the rights of the insured. Because of the complexity of insurance policies compared with that of other mechanisms, it may be more difficult to collect for insured financial responsibility obligations than for obligations assured with other mechanisms.

To understand when and under what circumstances insurance is available and how insurance costs are calculated, it is necessary to examine in detail the issue of what kinds of
risks are considered insurable. Failure to understand that many kinds of environmental risks are not insurable by private insurance companies is the most common source of problems in the formulation of environmental financial responsibility programs. The following sections discuss insurable risk in general, its application to environmental financial responsibility problems, and the use of private insurance as a financial responsibility mechanism.

**Insurable Risk**

The first principle of insurable risk is that insurers are not gamblers or speculators. Insurers do not assume risks that have a substantial probability of incurring large losses for the company; instead, insurers assume only those types of risk that can be pooled and can be counted on to demand a relatively constant total payout. For example, an insurance company with $1 billion in assets would not normally insure a single event having a 1-in-10 chance of costing $1 billion in payout and a 9-in-10 chance of costing nothing, because this would involve gambling the entire assets of the insurance company. The same insurance company, however, might be prepared to write 1,000 policies of $1 million each to cover a risk that has a 10-percent probability of occurring, providing that the insured events are not correlated. Although a $1 billion payout is a possibility in this case, the company would insure these risks because the probability of such a payout is vanishingly small (i.e., 1-in-10 to the 1,000th power).

Speaking more technically, insurance functions according to the Law of Large Numbers. This statistical law states that, under certain conditions, one can be increasingly certain of the outcome of a series of events as the number of such events increases. In mathematical terms, the law states that the greater the number of independent random variables that are added together, the smaller the variance of the sum of these numbers. A random variable is a value that varies within a range of values, and such variables are independent if the fact that one random variable has a high or low value does not have any influence over whether another random variable in the group has a high or low value. In other words, there can be no correlation among the values of independent random variables.

In the insurance context, the random variables to be added together are the potential claims against each outstanding policy. Each of these claims will be independent in a sta-
tistical sense if the occurrence of one event that resulted in a claim is not correlated with the occurrence of other events resulting in claims. The more insurance policies an insurance company sells, the greater the number of independent variables, and the better the insurance company's ability to predict the expected value of claims.

In addition to large numbers of independent variables, other factors are necessary for the Law of Large Numbers to be applicable to insurance risks. In general, the more definite the loss is in time and amount, and the more accidental or fortuitous the occurrence of the loss, the more predictable the risk. These points are discussed further below, along with an explanation of how insurers treat substandard risks.

Losses Must Be Predictable. For insurers to be able to make accurate predictions of losses and thus to avoid gambling with the assets of the company, the expected value of the typical claim must be known with accuracy. For property and casualty coverages (which include fire, accident, and liability insurance), this means that the insurer must know both the probability that a loss will occur and the average value of a loss if it does occur. There are several reasons why these values may not be known. For example, the type of event might be new, as in the case of product liability claims for a new product. Rare and unusual coverage is another example of a circumstance in which it would be difficult to predict losses accurately. For example, commercial diving is a sufficiently small and unusual industry; thus, even though there is a well-documented record of claims, most insurance companies do not offer workers' compensation insurance to diving firms. Problems of predictability can also occur for new types of hazards or for new interpretations of responsibility for a hazard; for example, it has now become extremely difficult for daycare centers to get liability insurance because of uncertainties about the frequency and liability associated with child abuse cases.

There is no real solution to trying to provide insurance for unpredictable losses. In some cases a limited amount of insurance may be available for any risk. For example, at one time, Lloyd's of London was famous for writing individual policies for almost any kind of risk. However, it is one thing to write a limited number of policies for unusual and unpredictable risks, and another to offer a line of insurance for unpredictable risks. Lloyd's, which functions as an unlimited partnership, caused thousands of its partners to go into bank-
ruptcy in the late 1980s, largely as result of larger than anticipated "toxic tort" claims in the United States.

**Losses Must Not Be Correlated.** The Law of Large Numbers cannot be applied if the risks involved are correlated. A classic example of correlated risk is the damage caused by floods. Hydrological data in most areas of the United States allow highly accurate predictions of the probability of a flood and of the expected value of the damage a flood may cause to specific structures. Nevertheless, flood losses are considered uninsurable, because for any given area in any given year, either no claims will be made or claims will be submitted by all or a large number of insureds in the area. In the latter case, insurance companies would incur catastrophic losses that could bankrupt them. For similar reasons, most insurance policies contain exemptions for losses due to war, earthquakes, and nuclear accidents. (In some cases, such as floods, Federal insurance is available. In other cases, some private insurers have ignored the issue of correlation; however, ignoring the problem of correlated risks has its perils. One hurricane in Florida caused the bankruptcy of over half a dozen Florida insurers offering hurricane coverage.)

Correlation of losses is also the reason why many kinds of business losses cannot be insured. A recent example illustrates the point: For a time, many London insurers offered insurance to computer leasing companies for the resale value of their computers. When IBM surprised the industry by introducing an innovative new mainframe computer, all of these policies had to be paid simultaneously, and a number of insurers were rendered nearly insolvent. (This example also illustrates that even insurance companies can err in determining what is an insurable risk.)

**The Loss Produced by the Peril Should Be Definite in Time and Amount.** This is an administrative and statistical requirement necessary to adjust claims properly and to reflect liabilities accurately. Insurance perils meet this criterion in varying degrees. In life insurance, for example, there is little difficulty in determining when the insured died and whether or not the insurance policy was in force when the death occurred. It may be more difficult, however, to assess when a burglary occurred and how severe the resulting loss was.

In situations where it is extremely difficult to assess when an event to be covered by insurance took place, insurers may issue *claims-made* policies. With claims-made policies,
coverage is in force only for claims made during the policy period, in contrast to occurrence-based policies, where coverage is in force if the insured event occurs or had its onset during the policy period. Environmental impairment liability (EIL) policies, which cover third-party liability claims caused by nonsudden environmental release incidents, are claims-made. Occurrence-based policies are generally more protective of the insured, because the insurer will have to pay any claim arising as a result of a covered event if the event occurred or was caused within the policy period, even in cases where the claim is not filed until long after the policy has been cancelled. If the insured has a claims-made policy and a covered event occurs, the insurer may cancel the policy when it expires (e.g., one month after an underground storage tank release incident), which would mean that damages resulting from subsequent claims by third parties would have to be paid by the formerly insured individual.

The Occurrence of the Loss or the Insured Event, in Individual Cases, Should Be Accidental or Fortuitous. Many insurable perils do not completely meet this criterion; people do exercise a degree of control over their health, their driving habits, or the care of their property. Insurers have several methods of limiting their liability where such moral hazards (i.e., conditions that can increase the frequency or severity of loss because of the attitude, character, or behavior of the insured person) are involved. These methods include:

1. Requiring the insured person to pay a deductible, i.e., an initial amount, before the insurer is liable. Thus, the insured has to pay a part of the loss. Deductibles applicable to the policy are included in the policy's declarations.

2. Including certain exclusions and conditions in the insurance policy. Perhaps the most obvious example of an exclusion needed to counter the problem raised by moral hazard is an exclusion for suicide in a life insurance policy.

Insurable Risk and Environmental Financial Responsibility Obligations

In order for insurance to be used as a financial responsibility mechanism, the event insured must be uncertain. For example, whether corrective action or third-party liability payments will be necessary cannot be known with certainty. Uncertainty of this type is called "event uncertainty." The possibility that a responsible firm will go bankrupt is also an uncertain event, and is thus potentially insurable. Uncertainty of this type is called "financial uncertainty." These types of uncertainty are discussed below.
**Event Uncertainty.** The two types of environmental events that are most likely to be uncertain are corrective action and third-party liability associated with releases of toxic substances. The fundamental problem with insuring these events is that, for a variety of reasons, the occurrence of such toxic substance releases is not a predictable event. For example, there is still no statistical database that could be used to predict the incidence of such releases. Further, whether and to what extent such releases will be discovered is unpredictable because of changes in the laws and regulations governing monitoring, and even in definitions of toxic substance releases. Even if the probability of the occurrence of such releases could be predicted with accuracy, the costs associated with toxic substance release corrective actions and third-party liabilities could not be predicted. For example, the costs of corrective action are subject to constantly evolving legal and regulatory standards, and the only accurate prediction that can be made is that corrective action will be more expensive next year than it was last year. The value of third-party liability awards associated with toxic substance releases is also unpredictable because this is a rapidly evolving area of tort law.

Environmental financial responsibility obligations can also be correlated events. An example of such correlation occurs when new monitoring regulations greatly increase the probability of discovering toxic substance releases over a short time period.

Decisions as to whether a given risk is insurable or not will vary from insurance company to company, and may be influenced by market considerations. Some companies offer small amounts of insurance for low-quality risks if the customer also purchases insurance for other more conventional risks. Much of the existing insurance for third-party liability and corrective actions for toxic substance releases has been sold on this basis. As Chapter 5 shows, however, the availability of insurance for environmental financial responsibility obligations has consistently been very limited, and the insurance market in this area has been characterized by many firms entering and then leaving the business.

However, even if environmental financial responsibility obligations more closely resembled conventional insurable risks, the continued availability of insurance for all small businesses needing it would be an open issue. Both automobile accidents and workplace
injuries are good examples of insurable risks, but there are thousands of small businesses that have difficulty obtaining automobile and workers' compensation insurance coverage.

Financial Uncertainty. Many of the problems associated with finding suitable financial mechanisms with which to meet the firm's financial responsibility obligations would be solved or minimized if insurance were available to deal with financial uncertainty, i.e., if it were possible to predict with certainty which firms would become bankrupt and when failure would occur. However, business failures are both unpredictable and correlated. No good system exists for predicting with high accuracy bankruptcy rates from year to year, despite the abundance of data on the subject. Further, financial uncertainties are correlated, in that bad times lead to an increase in the probability of bankruptcy for all firms. The problems of insuring banks—an industry subject to extensive financial regulation—against failure illustrate this situation. All of the private insurers allowed to insure state banks under some state laws failed during the savings and loan crisis, and even the Federal deposit insurance systems required massive influxes of capital to be sustainable.

In general, insurance firms do not insure against financial failure. However, there are exceptions to every general rule with respect to insurance. For example, EPA's closure and post-closure care insurance has an element of insurance against financial failure, but very little of this insurance is available, and then only to the soundest firms. In recent years, a market for municipal bond insurance has developed. This insurance guarantees investors against loss in cases where a municipality fails to meet its municipal bond obligations. However, this market is limited to bonds issued by very sound small municipalities, and many investment advisors have questioned whether such insurance would be adequate to meet the costs of a major wave of municipal bankruptcies.

Use of Insurance as a Financial Mechanism for Environmental Financial Responsibility Obligations

Kinds of Problems Insurance is Designed to Address. Insurance is a financial mechanism that can only be used to assure uncertain events and, because the life of insurance policies is limited and cancellation is likely if the insured's record is poor, insurance is only of limited value in dealing with timing problems. However, unlike the other private mechanisms discussed above, insurance can address funding problems. This is because the costs of
insurance are based on the expected rather than the total value of the insured financial responsibility obligation. Thus, if an event has a potential cost of $1 million but an average cost of $10,000, this means that the cost of insurance to insure that event will be based on the $10,000 average value; firms that could not themselves raise or otherwise obtain $1 million can obtain insurance against a $1 million event.

Availability and Costs of Insurance to Small Businesses

In a difficult insurance market, small businesses are the group most likely to have difficulty obtaining insurance. Small businesses normally have less data available to establish a safe claims history, both because small businesses have fewer facilities and tend to be younger than larger businesses. In addition, because small businesses have less need for other kinds of insurance, offering to provide a small business with an unusual coverage in order to entice it to buy other insurance is unlikely to happen.

Insurance premiums for liability insurance tend to range from 1.7 to 2.5 times the expected value of damages. The value of premiums over and above the expected value of damages covers sales costs, claims adjustment expenses (the most substantial portion), and profits for the insurance company. For each dollar of coverage provided, insurance thus has fairly high costs as compared with other mechanisms; however, the fact that premiums are based on the expected value rather than the total value of the insured financial responsibility obligation means that insurance is frequently the most affordable mechanism for small businesses that can obtain it.

Degree to Which Insurance Achieves Cost Internalization

By the simplest measure, insurance serves to internalize costs because the costs of insurance are approximately twice the expected value of costs to the responsible firm. However, because insurance transfers the burden of paying the costs of a large liability to the insurance company, the incentives for taking precautions against the occurrence of the insured event may be somewhat reduced. A classic problem of insurance is that it presents moral hazard problems of this type.
Relationship Between Insurance and Availability of Funds

For those who can obtain it, insurance is an excellent means of assuring the availability of funds up to the limits of the policy; like all private mechanisms, insurance will not provide funds beyond the limits of the policy. In addition, some financial responsibility obligations may not be covered because of exclusions or conditions of the policy. One of the largest potential loopholes is that most environmental liability policies make it a condition of the policy that the insured be in compliance with all applicable environmental regulations. As a result, funds may not be available when a toxic substance release occurs as a result of blatant disregard of existing regulations.

3.6 SUMMARY OF PRIVATE MECHANISMS

Exhibit 3-3 provides a summary of the major capabilities and problems of various types of private-sector mechanisms for small businesses. The major conclusions that can be drawn from this table are:

1. No private mechanism is available that can solve funding problems when the financial responsibility obligation has already occurred or is certain to occur.

2. Insurance can sometimes be used to address funding problems where the event is uncertain. However, insurance that can cover environmental financial responsibility obligations is limited in availability and is especially limited in availability for smaller businesses.

3. Small businesses cannot use the financial tests currently offered under existing environmental financial responsibility programs.

4. Mechanisms dependent on the funds of the responsible firm and guarantees can be used to address timing problems for small businesses that have adequate funds. However, these mechanisms are extremely expensive, with the result that they overinternalize costs and can, for certain marginal firms, actually reduce the amount of funds available to pay for the firm's environmental financial responsibility obligations.

In summary, financial responsibility programs built entirely on private mechanisms can address only portions of the financial responsibility problem, and even those portions that are addressed are dealt with in such a way as to impose excessive burdens on small businesses.

<table>
<thead>
<tr>
<th>Type of Mechanism</th>
<th>Type of Problems Addressed</th>
<th>Availability to Small Businesses</th>
<th>Costs</th>
<th>Costs Internalized</th>
<th>Assurance That Funds Will Be Available When Needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Tests</td>
<td>Not Applicable</td>
<td>Not Available</td>
<td>High for Small Businesses</td>
<td>Less than full internalization</td>
<td>None</td>
</tr>
<tr>
<td>Mechanisms Directly Dependent on Funds of Responsible Firm</td>
<td>Timing</td>
<td>Limited</td>
<td>Very High for Small Businesses</td>
<td>Costs greatly over-internalized</td>
<td>High, except for marginal firms, for which mechanism may reduce funds available</td>
</tr>
<tr>
<td>Guarantees</td>
<td>Timing</td>
<td>Limited</td>
<td>High for Small Businesses</td>
<td>Costs greatly over-internalized</td>
<td>High, except for marginal firms, for which mechanism may reduce funds available</td>
</tr>
<tr>
<td>Insurance</td>
<td>Funding of Uncertain Events</td>
<td>Very Limited</td>
<td>Most Affordable Mechanism</td>
<td>Potential moral hazard problem</td>
<td>High</td>
</tr>
</tbody>
</table>
CHAPTER 4. PUBLIC MECHANISMS

By definition, public mechanisms are those financial responsibility mechanisms provided by the public sector, i.e., by the government. The great advantage of public mechanisms is that, unlike private-sector mechanisms, they do not need to earn a profit consistently. This feature means that, compared with private mechanisms, public mechanisms can draw on a wider range of parties for funds and take greater risks. In fact, public mechanisms can even, under some circumstances, choose to subsidize certain types of businesses or to risk occasional serious losses. Government-sponsored insurance for bank deposits is a well-known public financial assurance mechanism, and this program can be used to illustrate many of the best and worst features of such mechanisms. Deposit insurance for banks is a service that is widely deemed essential to the stability of both the banking system and the economy as a whole, and it is not a service that any private-sector entity could undertake to provide. Until very recently, the Federal Savings and Loan Insurance Corporation (FSLIC) operated without requiring funds from any party but the insured banks; since then, however, the savings and loan crisis has exceeded the FSLIC's capacity, and its funds have had to be supplemented by monies from other sources. Although the FSLIC example achieved a high degree of notoriety, most Federal- and State-sponsored insurance programs have operated for decades without government subsidies.

All public mechanisms must balance the desire to make funds available to covered entities against the risk of losses to the government. Government-sponsored public mechanisms generally limit the extent of their liability to the amount of funds collected by the public mechanism. For example, States promise only to provide funding for environmental corrective actions up to the point at which the funds have been exhausted. Although this approach limits the government's risk, it also means that funds may not be available in all cases. In practice, both the States and the Federal government have generally felt morally bound to meet their obligations even when they were not legally bound to do so.

The following sections first describe a variety of public mechanisms that have been used as financial assurance mechanisms and then evaluate these mechanisms in accordance with the criteria discussed earlier, e.g., problems the mechanism is designed to address,
availability of the mechanism to small businesses, degree to which the mechanism achieves cost internalization, etc. Exhibit 4-1 lists public-sector financial assurance mechanisms. Additional criteria used to evaluate public mechanisms include: the amount of subsidy required to sustain the mechanism; the magnitude of the risks associated with the mechanism; and the effectiveness the methods used to limit this risk.

4.1 TYPES OF PUBLIC MECHANISM

The range of possible public mechanisms is limited only by the imagination, and these mechanisms offer a far greater spectrum in terms of design than is the case for private mechanisms. A number of public financial mechanisms have been used to assure the financial responsibility obligations of individual companies. One such mechanism is a fund that draws either on general revenues or specifically designated special revenues and can be used to meet the financial responsibility obligations of firms with inadequate funds. Superfund and the leaking underground storage tank (UST) trust funds are examples of such funds, which are discussed in detail in Section 4.2. Government-sponsored insurance is a familiar means of meeting financial responsibility obligations for such obligations as workers' compensation and automobile insurance; public insurance is discussed in Section 4.3. Recently, a number of States have set up insurance funds, which differ from true insurance in that the premiums they charge to participants are based on a simple measure (such as the number and capacity of underground storage tanks) rather than on an actuarial assessment of risk for each firm participating in the fund. Insurance funds are discussed in Section 4.4. In addition to deposit insurance programs, at least one State has set up a bond pool for surface mine operators; public mechanisms of this type, which are designed to assure financial risk, are called bond pools and are discussed further in Section 4.5. Finally, Section 4.6 summarizes the capabilities of all public mechanisms.

4.2 GOVERNMENT-SPONSORED FUNDS

Government-sponsored funds can be designed to vary with respect to their funding sources, the financial responsibility obligations they pay for, and the circumstances in which
EXHIBIT 4-1. Public-Sector Financial Assurance Mechanisms

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government-Sponsored Funds</td>
</tr>
<tr>
<td>Public Insurance</td>
</tr>
<tr>
<td>-- Mandatory public insurance</td>
</tr>
<tr>
<td>-- Residual public insurance</td>
</tr>
<tr>
<td>-- Complementary public insurance</td>
</tr>
<tr>
<td>Insurance Funds</td>
</tr>
<tr>
<td>Bond Posts</td>
</tr>
</tbody>
</table>
the fund may be used, including the eligibility of the responsible firm to be reimbursed from the fund. Each of these aspects of fund design is discussed below.

**Revenue Sources**

In principle, an entire spectrum of revenue sources can be and have been used to finance government-sponsored funds, from general funds to revenue sources that are tailored to reflect different degrees of actuarial risk or responsibility, equity considerations, and incentive effects. In practice, however, most such funds are based on a special revenue source that is at least loosely connected with the purpose of the fund. For example, Superfund is paid for by taxes on chemical and petroleum products and the Federal UST fund by a tax on petroleum products. State UST funds rely on per-UST fees or on gasoline or petroleum taxes.

**Types of Financial Responsibility Obligation For Which Funds May Be Used**

In principle, funds may be used to pay for any type of financial responsibility obligation. In practice, however, funds have not been used to pay for an owner or operator's third-party liability obligations. Funds have been used extensively to pay for corrective action, surface mine closure, and closure and post-closure care for municipal solid waste facilities. Congress once authorized a fund for third-party liability arising from releases from hazardous waste treatment, storage and disposal facilities, but the fund was never implemented. This apparent reluctance to use government-sponsored funds for third-party liability purposes may be due to the fact that the perceived benefit is small because failure to pay third-party liability awards does not lead to further damage. In contrast, corrective action and closure and post-closure care, if not adequately funded, may result in greater expenditures in the future.

**Circumstances In Which Government-Sponsored Funds Can Be Used**

Because government-sponsored funds are essentially a form of subsidy to affected firms, there is a tendency to limit the use of such funds to circumstances in which no other funds are available or all other sources of funds have been exhausted. For example,
Superfund is very limited in its potential application; it cannot be used, except under highly specialized circumstances, for permitted hazardous waste treatment, storage and disposal facilities. Similarly, the leaking UST trust fund can be used only when the responsible firm has failed to meet its corrective action obligations. Restricting funds in this way has several limitations, however. First, the more difficult it is to draw on the fund, the less effective the fund will be in achieving timely funding to prevent further environmental damage. Second, if small firms are allowed access to the fund only in cases of bankruptcy, a small firm facing a release of sufficient size to bankrupt it would be inclined not to report the release. Third, limitations on the use of a fund contribute to more small business failures than may be necessary because a firm that received partial support from the fund in meeting financial responsibility obligations might be able to avoid bankruptcy. Recognizing these kinds of problems, some States have experimented with funds that are designed to not have undue impacts on small businesses and to encourage the rapid reporting of releases. The State of Florida, for example, instituted for one year a fund that would pay for all corrective action expenses for responsible firms that monitored for and reported releases from their underground storage tanks. State officials generally consider this program to have been a success in terms of limiting small business impacts and encouraging rapid implementation of systems for the monitoring of underground storage tank releases.

Kinds of Problems Government-Sponsored Funds are Designed to Address

In principle, funds can be used to address any type of financial responsibility problem. In practice, however, because of the understandable reluctance of governments to subsidize the financial responsibility obligations of firms, funds tend to be used only when all other mechanisms fail. They are thus chiefly used for funding problems associated with certain events, for which no other solution is available. They may also be used, as they are in Missouri, to supplement other financial assurance mechanisms for surface mine reclamation, or as they are in Wisconsin, to supplement other mechanisms for municipal solid waste landfills.
Availability of Government-Sponsored Funds to Small Businesses and Costs of Such Funds

Public funds are intended to address the problems of small businesses that cannot meet their financial responsibility obligations, and their impact on small businesses depends on whether or not the fund demands that the responsible firm be driven into bankruptcy before the fund can be drawn on. Government funds can thus have either very adverse or very favorable impacts on small businesses, depending on their design. The costs of such funds to small businesses depend on the method by which the fund generates revenues. In most cases, however, the methods of revenue generation used by these funds tend to have the effect of providing a significant subsidy from large businesses to smaller businesses, who are thus the main beneficiaries of the fund’s activities.

Degree to Which Funds Achieve Cost Internalization

The major disadvantage of government-sponsored funds is that they fail completely to internalize costs. However, a fund that is designed to reimburse responsible firms for incurred costs or to reimburse firms that report releases promptly can have desirable incentive effects even though it does not force these firms to internalize their costs.

Ability of Government-Sponsored Funds to Ensure Availability of Funds

The principal advantage of government-sponsored funds is that they can provide funding when all other sources fail. However, as discussed above, funding will only be timely if uses of the fund are not severely circumscribed.

Subsidy and Public Risk

Government-sponsored funds subsidize those firms that cannot otherwise meet their financial responsibility obligations. The risk to the public posed by such funds is usually limited by restricting the fund’s liability to the total collections made by the fund; that is, such funds do not promise to meet all of the financial responsibility obligations of all firms needing funds but instead state clearly that they will continue to meet obligations only until the fund is exhausted.
4.3 PUBLIC INSURANCE

Public insurance is distinguished by two features: (1) all parties that have public insurance are paid fully for the financial responsibility obligations they incur, and (2) the fees for public insurance take the form of premiums that are based on the expected value of the financial responsibility obligation. Public insurance programs have taken a variety of forms. The principal forms are:

- Mandatory public insurance. Mandatory insurance requires all affected entities belonging to a certain group to purchase insurance from the government. This approach assures coverage and standardizes policies, but also requires the greatest degree of government involvement.

- Residual public insurance. Residual public insurance provides insurance for responsible firms that cannot obtain or do not choose to obtain private insurance. This mechanism allows the government to expand or contract the program in response to changes in the private insurance market. However, this approach still requires the government to engage in sales, underwriting, statistical studies, and claims adjustment.

- Complementary public insurance. Public insurance may also be used to complement private insurance by allowing private insurers to act as the primary underwriters of risk while the government acts as co-insurer or reinsurer. A co-insurer shares the potential liabilities of the primary insurer, while a reinsurer only covers losses above a given level. Complementary insurance reduces the government's role to a minimum, but does so at the risk of relying on the private insurance market.

Both mandatory and residual public insurance is commonplace in workers' compensation insurance programs. In six States, the workers' compensation program is mandatory, i.e., all businesses in the State must use the program. In 12 States, the government provides residual insurance; the public part of the system accounted for from 6.2 percent to 54.9 percent of the market in those States offering residual insurance. In total, State mandatory and residual workers' compensation insurance programs have successfully underwritten billions of dollars of insurance each year. Although such programs have occasionally encountered financial problems, they have solved these problems in every case without calling for subsidies from public or private sources (American Association of State Compensation Insurance Funds 1991; Kenney 1991).
At the Federal level, public insurance systems have been used to provide flood insurance and, during the seventies, insurance in high crime areas. Both of these programs have been able to meet their obligations without public subsidy. Although public insurance has been used in a variety of contexts, the only example Meridian has found that has any bearing on environmental financial responsibility obligations is Federal reinsurance for third-party liabilities for nuclear accidents, a program set up by the Price-Anderson Act. This program has never had to make a payout.

**Kinds of Problems Public Insurance is Designed to Address**

Like private insurance, public insurance is designed to address funding problems associated with uncertain events. Unlike private insurance, however, public insurance can address virtually any type of risk, and its availability can be assured.

**Availability of Public Insurance to Small Businesses and Costs of Such Insurance**

The great advantage of public insurance is that it can be made available to the kinds of small businesses that private insurers tend to avoid. For example, most firms in State residual workers' compensation insurance programs tend to be small- and medium-sized firms. The cost of public insurance is similar to that of private insurance.

**Degree to Which Public Insurance Achieves Cost Internalization**

Public insurance is similar to private insurance in its ability to internalize costs.

**Ability of Public Insurance to Ensure Availability of Funds**

Public insurance is subject to the same kinds of limitations as private insurance when it comes to ensuring that funds will be available. However, public insurance can more easily be designed to make funds accessible under unusual conditions than is the case with private insurance.
Subsidies and Risk

Public insurance is designed to avoid the need to subsidize firms by assessing premiums based on the actual risks of the responsible firm. However, public insurance programs entail some degree of risk to the extent that the government feels obligated to meet claims that go beyond the funds available. In general, States have not needed either to subsidize or to bail out public insurance systems that were designed to address uncertain events.

4.4 INSURANCE FUNDS

Insurance funds are a cross between government-sponsored insurance and government-sponsored funds. Like insurance, these funds provide funding for uncertain events regardless of the financial condition of the firm, but, like a fund, the resources in the fund derive not from a premium but rather from a special fee or tax that is borne by the potential recipients of the funds. Insurance funds tend to be much simpler to administer than public insurance, and can be used in situations where estimates of the probability that the event assured by the mechanism will occur cannot be made.

Insurance funds have been very popular with the States as mechanisms for responsible firms to use to meet their underground storage tank financial responsibility obligations. It is still too early, however, to determine whether this hybrid mechanism will be successful over the long term.

Kinds of Problems Addressed by Insurance Funds

Like public and private insurance, insurance funds address funding problems associated with uncertain events. They are most useful when there is insufficient data for true statistical estimates of risk to be made.

Availability and Costs of Insurance Funds to Small Businesses

The principal advantage of this approach is that these funds are available to small businesses. The costs they impose depend on the form the fee used to pay for the insurance fund takes.

4-9
Degree to Which Insurance Funds Assure Cost Internalization

Insurance funds internalize costs only to a limited extent. However, like funds, they require prompt reporting and regulatory compliance and can thus provide desirable incentives that encourage firms to take adequate care.

Ability of Insurance Funds to Ensure Availability of Funds

Insurance funds can in principle be excellent from the standpoint of fund availability. The greatest danger for an insurance fund is that the total size of the fund may not be adequate to cover the total obligations it will have to meet.

Subsidies and Risk

Because fees for insurance funds are not based on actual risk, they tend to result in low-risk firms subsidizing higher risk firms, which does not necessarily mean that larger businesses will be forced to subsidize smaller ones. For example, a new state-of-the-art single retail gasoline outlet may have very low risk, and the fees it pays into the insurance fund may actually subsidize a large chain of older retail outlets. The risk posed to the State by insurance funds is normally limited because the State restricts its obligation to the total size of the fund.

4.5 BOND POOLS

Bond pools are a mechanism designed to address financial uncertainty that results from timing problems. Member firms contribute to the pool, and the pool is drawn on in the event one of the member firms proves unable to meet its financial responsibility obligations. Mechanisms of this type include deposit insurance for banks and certain kinds of loan assistance programs. As the deposit insurance example shows, however, bond pools can be associated with a serious risk of failure. Despite this, Kentucky has successfully maintained a bond pool for surface mines for several years.

The Kentucky bond pool offers a means for surface mine operators to obtain reclamation bonds that might otherwise be unaffordable to them. The pool also has a fund to cover land reclamation in the event of bond forfeitures. The bond pool is voluntary, and com-
panies must apply and be accepted. Once in the pool, all of a company's future mining activities, both surface and underground, must be permitted through the pool. The pool is funded primarily through tonnage fees on all mining operations, which seem to be relatively low compared to those of other States (5 cents/ton for surface coal, 1 cent/ton for underground). The bond pool fund also provides assistance for bonding to permit mining of abandoned mine lands.

The Kentucky bond pool was formed in 1986. About 50 companies have applied, 34 have been accepted, and 32 are currently in the pool. Companies pay a one-time membership fee and provide part of the bond up front, based on an A, B, or C rating. The bond pool covers the remainder of the total bond amount, which averages about $3,000 to $3,500/acre. (Pool members also pay the monthly tonnage fees levied on all companies.)

The fund currently has about $6.6 million on hand, and a total bond liability of about $22 million. Members' liability is about $5.2 million. Kentucky recently conducted an actuarial study that showed that the fund was in good shape. Over time, the program has been amended to require more financial reporting, which allows the pool administrators to foresee any major problems and to adjust a member's rating. If the fund reaches $7 million, tonnage fees are to be suspended for those members who have paid in for at least three years. If the fund falls below $5 million, tonnage fees are to be reinstated.

In the event of a forfeiture, the bond pool fund is liable only for the amount of the bond (as would be the case with a private surety). This ensures that the fund does not become insolvent because of one major reclamation obligation that exceeds the bond amount. (The Office of Surface Mining, however, has still not approved this part of Kentucky's program.) Since its founding, the pool has had only three bond forfeitures, all involving one company that got involved in a lawsuit and went bankrupt.

The bond pool has bonded about 390 sites since its establishment. (Some of these have been bonded incrementally.) Currently, 354 sites are bonded by the pool. Although members do not have to be small companies to participate, only two or three pool members are large, that is, mine more than 500,000 tons/year. Others are small; they mine under 100,000 tons or between 100,000 and 200,000 tons.
Types of Problem Addressed

Bond pools are designed to address timing problems. In principle, they can be used as mechanisms to assure either certain or uncertain events, but are probably more commonly used to assure certain events.

Availability and Costs to Small Businesses

Like most mechanisms that address timing problems, the responsible firm can only make use of the bond pool if it already has adequate funds available to meet the costs of its financial responsibility obligations. For firms with adequate funds who can also demonstrate a reasonable degree of financial soundness (though not as great a degree as required by financial tests), this mechanism may have lower opportunity costs than similar private mechanisms.

Cost Internalization

Bond pools assure complete cost internalization.

Ability of Bond Pools to Ensure Availability of Funds

Bond pools can assure that funds will be available when needed as effectively as such private mechanisms as surety bonds and letters of credit.

Subsidies and Risk

If properly designed, bond pools need not require subsidies or impose significant risk to the State. However, there is some risk that, in a serious financial downturn affecting either the covered industry or the economy, the pool could be exhausted.

4.6 SUMMARY OF PUBLIC MECHANISMS

Exhibit 4-2 summarizes the major capabilities, advantages, and problems of public mechanisms from the small-business perspective. The major conclusions that can be drawn from this table are:
### EXHIBIT 4-2. Summary of Public Financial Responsibility Mechanisms

<table>
<thead>
<tr>
<th>Type of Mechanism</th>
<th>Type of Problems Addressed</th>
<th>Availability to Small Businesses</th>
<th>Costs</th>
<th>Extent to Which Costs are Internalized</th>
<th>Assurance that Funds Will be Available When Needed</th>
<th>Subsidies and Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Fund</td>
<td>Funding of all types of events</td>
<td>Can be made available</td>
<td>Low</td>
<td>Not at all</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Public Insurance</td>
<td>Funding of uncertain events</td>
<td>Excellent</td>
<td>Affordable</td>
<td>Costs internalized but potential moral hazard problem may remain</td>
<td>High</td>
<td>Limited</td>
</tr>
<tr>
<td>Insurance Fund</td>
<td>Funding of uncertain events</td>
<td>Excellent</td>
<td>Very affordable</td>
<td>Costs internalized but potential moral hazard problem may remain; does not internalize costs for high-risk firms</td>
<td>High</td>
<td>Subsidizes high-risk operations</td>
</tr>
<tr>
<td>Bond Pools</td>
<td>Timing problems</td>
<td>Limited</td>
<td>More affordable than comparable private mechanisms</td>
<td>Costs may be overinternalized</td>
<td>Some risk of default</td>
<td>Limited</td>
</tr>
</tbody>
</table>
1. Funds represent the only possible funding source for funding problems involving certain events. They do not force firms to internalize costs or require subsidies from unaffected parties, but they do make funds available when needed. In addition, funds can be designed specifically to address the needs of small businesses.

2. Public insurance and insurance funds are mechanisms that can be used when private insurance is inadequate to address financial responsibility obligations associated with uncertain events.

3. Bond pools may be a useful mechanism for stronger small firms that cannot obtain such private mechanisms as surety bonds or letters of credit.
CHAPTER 5. EXPERIENCE WITH FINANCIAL RESPONSIBILITY PROGRAMS

INTRODUCTION
This section examines three financial responsibility (FR) programs that have had a history of significant impacts on small businesses. The purpose of this analysis is to identify the problems small businesses have faced with these programs and to determine whether the experience of these businesses bears out the predictions made in earlier chapters of this report.

5.1 EXPERIENCE WITH THE SUBTITLE C FINANCIAL RESPONSIBILITY PROGRAM FOR HAZARDOUS WASTE TREATMENT, STORAGE, AND DISPOSAL FACILITIES

Overview of Statutes and Implementing Regulations
Section 3004(6) of the Resource Conservation and Recovery Act (RCRA) required EPA to establish standards applicable to the owners/operators of hazardous waste management facilities; the goal of these standards is the protection of human health and the environment. EPA concluded that financial responsibility performance standards were necessary and desirable to assure that funds would be available (1) when needed to close these treatment, storage, and disposal facilities (TSDFs) in an environmentally safe manner, (2) when needed to pay for the on-going post-closure care of TSDF sites, and (3) when needed during the operating life of a facility to pay third-party damages awarded for injuries resulting from the operation of these facilities (46 FR 2821).

In 1978, EPA issued the first proposed rule to establish financial responsibility requirements (43 FR 58995, 59006-7). This proposal would only have allowed owners/operators to use trust funds as the mechanism for assuring that funds would be available for closure and post-closure care of their TSDFs. Although the extent of a facility’s closure and post-closure care obligations varies by type of facility, costs to close a large landfill can be as high as $250,000, and post-closure care costs for such a landfill can be as much as $30,000 per year. The proposal would have required owners/operators to fully fund the trust fund for closure at the time it was established and to fund the post-closure fund over the life of the facility or 20 years, whichever was shorter. Insurance coverage for third-party lia-
bility was also to be required for permitted facilities. (EPA believed that TSDFs with interim status would be unable to obtain such insurance.)

In response to comments, EPA developed a new financial responsibility proposal (45 FR 33260 et seq.) that reflected significant changes to the program. For example, the requirements for closure trust funds were modified to allow the fund to build up over the operating life of the facility, or over 20 years, whichever is shorter. This and other modifications were intended to ensure that smaller firms would not be forced out of business (an environmentally undesirable response) as a result of the burden imposed by the trust fund. The re-proposal also permitted owners/operators to use mechanisms other than trust funds to demonstrate their financial responsibility; these alternative mechanisms included surety bonds, letters of credit, a financial test (a form of self-insurance), and guarantees by a second entity (corporate guarantees). In addition, municipalities would have been permitted to rely on a revenue test to demonstrate their financial responsibility, and States were allowed to assume responsibility for closure and post-closure care. The proposed rule also changed the requirements for financial responsibility for third-party liability by lowering the amount of third-party liability insurance required to $1,000,000 per occurrence (with a $2,000,000 aggregate) and by requiring facilities in interim status to obtain liability insurance.¹

All of these proposed modifications were adopted in EPA's 1981 interim final rule (46 FR 2802 et seq.), which added a further revision: it required owners/operators using letters of credit or surety bonds also to establish a standby trust fund. That is, the rule required that any funds drawn under these instruments be placed directly into the standby trust funds because any funds received directly by the Agency would otherwise have to be paid into the U.S. Treasury, and could not be used specifically to pay for closure and post-closure care of the facility.

A revised interim final rule (47 FR 15032 et seq.) allowed TSDF owners/operators to use insurance policies to provide funds for closure and post-closure care.

In July of 1982, EPA requested public comment on the appropriateness of establishing financial responsibility requirements for corrective actions at TSDFs (47 FR 32274 et seq.).

¹ In 1988 (53 FR 33938 et seq.), EPA extended the mechanisms that could be used to demonstrate financial responsibility for third-party liability to include financial tests, letters of credit, surety bonds, trust funds, and corporate guarantees.
The preamble to the Request for Comments discussed the difficulties of designing an FR program for corrective action at TSDFs because of the difficulty of determining with a reasonable degree of certainty whether corrective action would be required during the operating life of any given facility, and the cost of any such corrective action. (The costs of corrective action can vary from as little as several hundred thousand dollars to millions of dollars.)

Under the Hazardous and Solid Waste Amendments (HSWA) of 1984, Congress mandated that EPA establish financial responsibility requirements for corrective action at Subtitle C (hazardous waste) facilities. HSWA established strict deadlines for the issuance of implementing regulations and additionally stated that, if EPA missed these deadlines, the requirements would go into effect by statute. In response to this mandate, EPA adopted financial responsibility regulations for corrective action (50 FR 28702 et seq.) directly from the statute. However, the mechanisms owners/operators could use to demonstrate their financial responsibility were not identified for another year, when EPA proposed FR rules for corrective action at permitted facilities (51 FR 37854 et seq.). Allowable mechanisms under the proposal included trust funds, surety bonds guaranteeing performance, letters of credit, financial tests, and corporate guarantees; however, no final rule has yet been published and financial assurance mechanisms for corrective action have therefore not been established. In 1990, EPA published another proposed rule (55 FR 30798 et seq.) discussing FR for corrective action and describing the earlier proposal as a regulatory framework that could be used to examine the adequacy of a given facility's financial assurance for corrective action on a case-by-case basis.

EPA has not to date proposed rules to address the issues of financial responsibility for post-closure care after thirty years, or for third-party liabilities during the post-closure care period.

Small Business Experience with RCRA Subtitle C's FR Requirements

EPA’s financial responsibility regulations were implemented before the Regulatory Flexibility Act was passed. Consequently, EPA saw little need to determine the size of the potentially affected small-business community or the impacts of its FR programs on this community before issuing these regulations. However, the special financial responsibility
problems of small disposal facilities (defined as those with less than $10 million in net worth) have been examined several times by various parties. For example, EPA noted in 1983 that 86 percent of all disposal facilities were covering their closure and post-closure care requirements using either the financial test of self-insurance or a corporate guarantee; to use either of these mechanisms, either the responsible firm or its parent must have more than $10 million in net worth. EPA also estimated at that time that 4 percent of the remaining firms were large firms that had failed some aspect of the financial test of self-insurance, which means that only 10 percent of all disposal firms then in existence were small businesses. A somewhat later survey by the General Accounting Office (GAO) found that 32 percent of disposal facilities responding to the survey reported having less than $10 million in net worth. Thus, by the time the Subtitle C FR regulations had been implemented (e.g., by 1982), small businesses constituted a relatively small portion of all disposal facilities.

There is no way retroactively to determine the magnitude of the impact of the Subtitle C financial responsibility regulations on the small businesses operating disposal facilities prior to the implementation of these regulations. However, the Regulatory Impact Assessment (RIA) developed by EPA to accompany these rules provides some insight into their problems. The RIA, prepared in 1981, estimated that the complete Subtitle C financial assurance program would have present-value costs to affected firms of $896 million over 50 years. Virtually all of these costs would be borne by smaller firms because they would not be able to use a financial test of self-insurance or a corporate guarantee. The RIA did not evaluate whether expenditures of this magnitude might drive small businesses to close. EPA’s estimate of nearly $1 billion for its initial FR program was almost certainly an underestimate, both because closure and post-closure care costs were assumed to be lower than they proved to be in fact and because insurance was much more expensive than anticipated.

Although the impact caused by the imposition of these FR regulations cannot be re-captured, a GAO report published in the mid-80s describes the problems continuing to affect all covered businesses, and particularly small businesses, that had managed to survive. The
report drew a number of conclusions with respect to the availability and cost of insurance to cover environmental obligations:

- In 1982, two-thirds of companies used liability insurance or a combination of liability insurance and the financial test of self-insurance to meet EPA's FR requirements for third-party liability. By 1986, only 42 percent of companies made any use of liability insurance to meet these requirements (32.3 percent of the firms in the survey were businesses with less than $10 million in net worth that could not use the financial test. Thus most of the firms still relying on insurance as a financial responsibility mechanism were firms that could not avail themselves of any other financial assurance mechanism.)

- The number of insurers offering coverage had declined from a high of 19 in 1984 to 12 in 1986.

- Premiums for insurance had increased 6-fold for sudden and accidental coverage and 11-fold for gradual coverage.

- The burden of insurance unavailability fell disproportionately on smaller companies; most smaller companies who had left the industry cited the unavailability of insurance as the most important reason for closing their disposal facilities. For larger companies who chose to close their facilities, five other regulatory and business concerns were cited ahead of insurance availability as a reason for closure.

This GAO report thus documents the increasing difficulty small TSDFs were facing in attempting to comply with Subtitle C's FR requirements. It also provides evidence of the failure of private mechanisms to address the problem.

The Corrective Action Problem

One enormous financial responsibility problem that has resisted solution is the corrective action problem, i.e., how to assure that funds will be available if and when needed to clean up releases from the facilities covered under Subtitle C of RCRA. An early EPA study of the corrective action problem estimated that the corrective action costs disposal facility owners/operators would be unable to pay unless FR mechanisms were in place for all facilities would be six times the amount such owners/operators would be unable to pay for closure and post-closure care. Thus potential corrective actions are a far more significant financial responsibility problem than closure and post-closure care. However, EPA has not been able to address the corrective action problem with the private financial assurance mechanisms.
available. For example, it would be administratively extremely complex and time consuming to turn these problems over to the already overburdened Superfund. Such mechanisms as letters of credit, surety bonds, and trust funds would require owners/operators to set aside large sums of money to provide protection against an event (i.e., release) that may in fact never occur. Moreover, EPA estimated that fully one-third of all corrective actions had already occurred and would thus not be coverable by insurance (which cannot be used to insure against an event that has already occurred), and that one-third of these corrective actions would occur at facilities that had funding problems of the kind that private mechanisms are unable to address.

Confronted with these insuperable difficulties, EPA has chosen to implement financial responsibility for corrective action on a case-by-case basis, as part of the Agency’s overall settlement when a corrective action occurs. This approach allows EPA (1) to require an owner/operator to obtain a financial assurance mechanism when such a mechanism can solve a timing problem, (2) to ignore FR requirements altogether when they would be counterproductive, or (3) to require more limited evidence of financial responsibility in cases where requiring full up-front financial responsibility might be counterproductive.

Summary

In summary, experience gained under the Subtitle C financial responsibility program reflects the problems with those FR programs that rely solely on private mechanisms. The Subtitle C program is extremely expensive, and most of this expense has been borne by small businesses. The program’s attempt to rely on private insurance for third-party liability raised serious problems of availability, especially for small businesses. The absence of any private insurance for corrective action, combined with the absence of any public fund intended for facilities covered under Subtitle C, means that the largest financial responsibility problem—funding for corrective action from disposal facilities—has essentially not been addressed unless the responsible firm can pay for the costs of corrective action itself.
5.2 SURFACE MINE RECLAMATION

Legal and Regulatory History

The Surface Mining Control and Reclamation Act of 1977 (SMCRA) established requirements for coal mine operators to submit a reclamation plan as part of their permit application before commencing surface mine operations. This plan must include a timetable for the successful re-vegetation of the permit area. After the permit application has been approved, but before the permit is issued, the operator must post a performance bond payable to the United States or to the appropriate State, as specified in the permit application. Based on a GAO survey, typical costs for this type of reclamation are approximately $60,000 per site. (SMCRA also allows operators to self-insure or use trust funds for this purpose under certain circumstances.)

In 1983, the Department of the Interior adopted reclamation bond rules (48 FR 32959 et seq.). These regulations permit the regulatory authority to allow for a surety bond, a collateral bond, a self-bond, or a combination of these methods. A surety bond is defined by these rules as an indemnity agreement in a sum certain payable to the regulatory authority, executed by the permittee as principal, and supported by the performance guarantee of a corporation licensed to do business as a surety in the State where the operation is located (30 CFR 800.5). A collateral bond is defined as an indemnity agreement in a sum certain executed by the permittee as principal and that is supported by a deposit with the regulatory authority of one or more of the following: a cash account; negotiable bonds of the United States, a State, or a municipality; negotiable certificates of deposit; an irrevocable letter of credit; a perfected, first-lien security interest in real property; or other investment grade-rated securities having a sufficiently high rating. A self-bond is defined as an indemnity agreement in a sum certain executed by the applicant or by the applicant and any corporate guarantor and made payable to the regulatory authority.

Small Business Experience

The Office of Surface Mining requirements affect many more small businesses than the RCRA Subtitle C FR regulations; however, because of the relatively small size of the amounts to be assured, their impact has been correspondingly smaller. Nevertheless, finding
private mechanisms with which to demonstrate this financial responsibility is a constant problem for smaller surface mining operations. A recent GAO study documents this situation (U.S. GAO 1988b). This study examined the problems of 321 surface mine operators who had lost their surety bonds not as a result of their actions but as a consequence of the bankruptcy of their surety companies. This study found that 15 percent of the affected operators left business or had to declare bankruptcy because they were unable to find a replacement financial assurance mechanism. Other surface mine operators had to suspend operations and lay off workers temporarily. Those who did find an alternative mechanism invariably had to pay more and to post a larger amount of collateral. Again, the impact of these requirements was largely on smaller operators. Seventy-five percent of large coal mine operators were able to replace their lost surety bonds with an equivalent bond; only 10 percent of small operators (defined as those producing less than 100,000 tons of coal a year) were able to do so.

This study suggests that even when funding problems are minimal, small businesses can have severe difficulties finding suitable mechanisms to address timing problems.

5.3 RCRA SUBTITLE I--UNDERGROUND STORAGE TANKS (USTs)

Background

In 1988, EPA issued financial responsibility requirements for owners/operators of underground storage tanks containing petroleum (53 FR 43322). These regulations established financial mechanisms that owners/operators can use to demonstrate their financial responsibility for corrective actions and third-party liabilities stemming from UST releases. Financial responsibility can be demonstrated by any of the mechanisms allowed for this purpose by Subtitle C; in addition, the UST FR rules provide for the establishment of State assurance funds. Compliance effective dates for these rules have been phased in over several years to provide time for the providers of financial assurance mechanisms to develop suitable policies and programs or to adapt their policies and programs to these requirements. The first facilities to comply with the FR regulations were petroleum marketing firms owning 1,000 or more USTs and all other UST owners reporting a tangible net worth of $20 million or more; the deadline for such facilities was January 24, 1989. Petroleum marketing firms
owning 100-999 USTs were required to comply by October 26, 1989, and petroleum marketing firms owning 13-99 USTs were to be in compliance by April 26, 1991. All other petroleum UST owners not described above were scheduled to achieve compliance by December 31, 1993. However, EPA has extended the compliance deadlines for the last two groups of UST owners because of the unavailability of insurance and the slow development of State UST funds.

Small Business Experience

As noted above, the Subtitle I financial responsibility program has not yet been fully implemented, and its full impacts are therefore uncertain. However, in contrast to the Subtitle C FR program, EPA did carefully analyze the potential small business impacts of the UST FR program. This FR program, and the problems it has encountered, are thus of particular interest to students of the FR problem.

EPA’s Regulatory Impact Assessment for the UST FR program estimated that, of the 193,000 retail motor fuel outlets (primarily gas stations) in the United States, 80 percent were owned by small businesses (defined as firms with less than $0.6 million in annual sales), and that an additional 59,000 small business were lessees of retail motor fuel outlets, i.e., leased their gas stations. None of these small businesses could use any financial assurance mechanism except insurance to demonstrate their financial responsibility. In addition, the RIA estimated that more than 129,000 of the estimated 175,000 owners of USTs who were not retail motor fuel outlets would not be able to use the financial test. These financial responsibility requirements, unlike those for Subtitle C, will thus be imposed on a community that consists largely of firms that cannot use the financial test and one that, unlike the surface mine operator community, cannot be expected to raise the kinds of funds required to meet their financial responsibility obligations.

In its RIA, EPA estimated that, if insurance were available to all affected firms, the present value over 30 years of the Subtitle I financial responsibility requirements would be $1.96 billion, and that the program would provide funding for less than 10 percent of all UST release costs that would not have been funded in the absence of these regulations. (This low achievement rate is due to the fact that insurers will not insure already existing releases,
and most UST releases have already been detected.) EPA’s RIA did not address the issue of the economic impact on small firms of the unavailability of insurance.

In practice, private insurance has not proved to be as available to UST owners as EPA had originally hoped. Between the time of the proposed and final rules, the largest single insurance program for USTs ceased operation because of excessive losses. The largest remaining insurer of USTs, Federated, offers environmental coverage only to firms buying the company’s full line of insurance products. The Petroleum Marketers Association of America (PMAA) estimates that only 16 percent of its members use private insurance to satisfy any of their financial responsibility requirements, and that, in 1991, 8.4 percent of their members had no coverage of any kind.

However, in response to demand from the large and diverse petroleum marketing community, and in recognition of the difficulty of finding funds to clean up UST leaks, 43 States have set up some form of insurance fund to address this problem. PMAA reported that, in 1991, 83.2 percent of its members had insurance coverage from State funds. These State funds have thus provided a mechanism to help businesses to meet their financial responsibility obligations even when private insurance is not available. Further, many of these funds have already provided extensive funding of releases that might not have been funded in any other way.

Unfortunately, States have taken very different approaches to setting up State funds, and these funds also do not automatically provide all the coverage required by the regulations for all owners and operators. For example, some States do not provide third-party liability coverage at all, and others have high deductibles (up to $100,000) that small firms may have difficulty satisfying. It is uncertain how EPA will choose to address these enforcement problems.

Nevertheless, the Subtitle I experience to date is strongly indicative of how public mechanisms can aid a program directed at small businesses in a situation in which private mechanisms would almost undoubtedly have been unable to address the bulk of the problem.
CHAPTER 6. DESIGN OF FINANCIAL RESPONSIBILITY PROGRAMS

6.1 BASIC PRINCIPLES

This review of the public and private mechanisms available and of the experience of existing financial responsibility programs suggests the critical importance of matching mechanisms to the particular problem to be addressed. Private mechanisms are unable to address funding problems for certain events; even for uncertain events, these mechanisms are unable to serve the small business market consistently. As a result, a financial responsibility program designed to address funding problems must include public mechanisms if it is to achieve the most basic goal of a financial responsibility program, i.e., to provide funds when needed.

For funding problems associated with certain events, a public fund is a necessity. For funding problems associated with uncertain events, private insurance should be supplemented either with an insurance fund or by public insurance. Insurance funds have the advantages of administrative simplicity and of not needing good data concerning risk. Insurance funds are thus particularly useful at the outset of a financial responsibility program. However, insurance funds have the disadvantage over the long run of forcing low-risk operations to subsidize high-risk operations. Once good risk data become available, there is much to be said for switching from an insurance fund to true public insurance.

Private mechanisms can address timing problems, and it is not clear that public mechanisms can significantly improve on private mechanisms in addressing problems of this kind (the Kentucky bond pool may be an exception). Unfortunately, all mechanisms that can address timing problems tend to be very expensive for small businesses and routinely result in over-internalization of costs. Dealing with the over-internalization problem requires detailed, program-specific analysis and may involve changes in laws other than those establishing financial responsibility programs. Section 6.2 examines some issues with respect to the design of financial responsibility programs that may reduce this tendency to over-internalize costs, and Section 6.3 discusses possible changes in other laws that could reduce over-internalization.
6.2 DESIGN OF FINANCIAL RESPONSIBILITY PROGRAMS TO ADDRESS TIMING PROBLEMS

The key to addressing the high costs of financial responsibility mechanisms designed to address timing problems is to reduce both the value of the funds set aside and administrative costs to the maximum extent possible. To reduce the total value of the financial responsibility obligations that a firm must meet, agencies should consider:

- Allowing buildup periods for mechanisms intended to meet future financial responsibility obligations;
- Allowing firms to use reasonable interest rates in calculating the funds needed for mechanisms designed to address future events;
- Limiting the number of years for which financial responsibility is required for post/closure care and or extended corrective action periods; and
- Requiring financial responsibility only in the amount needed to actually address problems at the site.

To reduce the costs of trustees for these mechanisms, Congress (and state legislatures, when appropriate) should allow environmental agencies to collect the funds from financial responsibility mechanisms directly when they need to. (EPA’s interpretation of current law is that the Agency cannot collect funds from financial responsibility mechanisms without the funds first going to the Treasury Department. As a result, EPA has set up an elaborate and expensive system to allow it to direct the disbursement of funds without actually directly controlling the funds.)

6.3 CHANGES IN OTHER LAWS THAT AFFECT THE COSTS OF FINANCIAL RESPONSIBILITY PROGRAMS

Two kinds of laws have major impacts on the costs and usefulness of various types of private financial mechanisms: tax laws and bankruptcy laws. Tax laws tend to treat funds set aside for financial responsibility purposes as if they were still under the control of the firm and tax these funds as part of the firm’s income (if the assets earn income) or property. If funds set aside for the purpose of meeting financial responsibility obligations were not treated as an asset of the firm, the taxes on such funds would be considerably lower and the
costs associated with setting funds aside would also be lower. Changing the tax treatment of funds would require changes to the revenue code.

The low priority given to financial responsibility obligations by bankruptcy law is the origin of the complexity of the mechanisms that must be used to set aside funds to meet financial responsibility obligations. If financial responsibility obligations were given a high priority in bankruptcy, simple managed accounts without trustees or guarantors could be used to meet a firm's financial responsibility obligations. Such an approach would also permit smaller firms to make use of a financial test of self-insurance. This approach could only be achieved with revisions of the Federal bankruptcy code.
BIBLIOGRAPHY


