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Small Firms and Superfund: Assessing the Impact

Jeffrey E. Sohl and William E. Wetzel, Jr.

While all firms experience varying degrees of difficulty in complying with environmental regulations, small firms have their own set of special problems in dealing with environmental compliance. The lack of legal and engineering staffs, the management structure, and a high cost per unit of production to comply with environmental regulations implies a diversion of a small firm's limited resources to formulating a cost effective response to the rapidly changing landscape of environmental regulations. The cornerstone of the shifting focus towards hazardous waste regulation, in terms of both actual and potential impacts, is the Comprehensive Environmental Response, Compensation, and Liability Act, commonly referred to as Superfund. Given the unique liability features of Superfund, the objective of this research is to assess the impact of Superfund liability on the ability of small firms to raise capital, invest in plant and equipment, and to continue their role as the principal job generating segment of the U.S. economy.

I. INTRODUCTION

Environmental regulations affect all firms, both large and small, and in both positive and negative directions, depending upon which side of the regulation a particular firm is situated. At the present time there are 85 different regulations that may affect small business directly, and these 85 do not include regulations that may have an ancillary effect on the profitability of a small firm. While all firms experience varying degrees of difficulty in complying with environmental regulations, small firms have their own special set of problems in dealing with environmental compliance. Typically, small firms do not have legal or engineering staffs to assist them, nor do they have the financial resources available to larger firms. Often a small firm's cost per unit of production to comply with environmental regulations is much larger than

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those of their large competitors (Environmental Protection Agency, 1988). In addition, the management structure of the small firm does not typically include an environmental officer with the accompanying staff to respond to environmental regulations. The implication of this lack of an environmental response team implies a diversion of a small firm's limited resources to formulating a cost effective response to the rapidly changing landscape of environmental regulations.

Of this myriad of federal environmental regulations, those policies addressing the regulation of hazardous wastes are rapidly evolving into one of the major issues affecting the role of the small business sector as the major generator of new jobs in the U.S. The cornerstone of hazardous waste regulation, in terms of both actual and potential impacts, is the Comprehensive Environmental Response, Compensation, and Liability Act, commonly referred to as Superfund, passed by Congress in 1980. In 1986 Congress extended and strengthened Superfund through the Superfund Amendments and Reauthorization Act. Together, Superfund and its amendments have led to very significant regulatory programs that are absorbing increasing resources on the part of both the Environmental Protection Agency (EPA) and, more importantly, regulatees everywhere (Portney, 1992). The actual and potential magnitude of Superfund related costs is staggering. According to a recent EPA study (EPA, 1990) the total annual cost of compliance incurred by all regulated parties as a result of the entire set of federal environmental regulations amounted to $97 billion. Of this total, EPA estimates that $12 billion, or 12 percent, are costs directly attributable to Superfund. Over the next decade these costs are expected to grow, with total annual compliance costs estimated to be between $150 and $165 billion by the year 2000, and Superfund's share of these costs estimated at $32 billion. Thus, by the end of this decade the annual cost of complying with federal hazardous waste regulations will account for about 20 percent of all federally mandated environmental spending (Portney, 1992).

Once a hazardous waste site has been designated a Superfund site, the EPA names one or more potentially responsible parties (PRP). This PRP designation is the name given to any party which may have generated, transported, or disposed of waste at a Superfund site, or may have owned or operated a site. Superfund's site-by-site fundraising mechanism relies on strict, retroactive, joint, and communal liability. This liability standard means that PRP's are liable for waste disposal that took place before Superfund was passed (retroactive liability), and that may have been lawful at the time (strict liability). Liability is not limited to a PRP's "fair share" of costs based on its wastes. Each PRP may be held liable for the entire cost of cleanup, regardless of its specific contribution to a site (joint and communal liability). Average

remedial design and cleanup costs are in the neighborhood of $25–$30 million per site (Porter, 1993), although some studies have estimated these costs to be as high as $50 million per site (Russell, 1991).

The indiscriminate liability features of Superfund provide the motivation for this research. Specifically, the objective of this study is to assess the impact of Superfund Potentially Responsible Party (PRP) status on the ability of smaller firms to raise capital, invest in plant and equipment and to continue creating jobs. The analysis of the impact of Superfund on small firms is especially important given the fundamental change in federal environmental regulation that has occurred over the past 20 years. In that time span, the focus of environmental regulation has shifted away from the traditional concentration on air and water pollution and toward the regulation of hazardous waste (Portney, 1992; Vig & Kraft, 1990). Thus, an assessment of the impacts of Superfund liability on small firms is not only important for Superfund's direct effects on PRPs, but also provides some assessment of the general effects of increasing hazardous waste regulations that appear to be the emphasis of current environmental policy.

II. SURVEY DESIGN AND SAMPLE CHARACTERISTICS

The instrument designed for the evaluation of the impact of Superfund was a questionnaire mailed to 5000 firms that were at some point designated a potentially responsible party or a third party defendant. The survey was sent to these PRPs in two sets of mailings. In the first stage, all 5000 PRP received the cover letter and the survey instrument. Approximately three weeks later all 5000 were again sent the identical survey with a reminder of the earlier mailing. To eliminate the potential for multiple responses from a single respondent, each survey was identified by three distinguishing qualifiers and all duplicates were removed from the final analysis. A total of 520 useable surveys were returned, representing a response rate of 10.4 percent.

An examination of the characteristics of the respondents reveals several interesting findings. The firms comprise a diverse geographical distribution with the principal place of business representing 45 states and 430 zip codes. The largest concentration in any one state is six percent (33) of the total respondents. Eighty-eight percent of the firms in the sample employ 500 or less employees, which, when compared with corresponding total U.S. figures indicates a representative sample of firms with respect to employee size. The overwhelming majority of these small firms are organized as corporations (68%) or sub-*S* corporations (21%), with the remaining firms being either

sole proprietorships or partnerships. Approximately half of these firms claim manufacturing or mining as their major business activity, followed by wholesale or retail trade and services as the next two most common classifications of activity. The majority of the small firms exhibit little, if any, growth over the previous three year period. Thirty-two percent of the firms indicate no growth in their annual sales for three years, followed by 25 percent indicating a small annual growth (between five percent and nine percent), and nearly one-quarter indicate a declining sales pattern. A modest 16 percent of the firms claim annual sales growth patterns in excess of 10 percent. As expected, nearly 70 percent of the respondents are either the owner/operator or manager of the firm, and as few as 17 percent consider themselves to be the environmental officer.

What emerges from this demographic analysis is a geographically diverse sample of small firms from industries that are typically associated with a reasonable probability of at some point being named a PRP under existing Superfund legislation. These firms also exhibit both sales and size characteristics that would render them a classification as a small U.S. firm.

For the small firms in the study, approximately two-thirds are in the Superfund limbo category of being named a PRP but the allocation of their legal liability has yet to be determined. In contrast, a quarter state that their Superfund legal liability has been paid and no longer appears on the balance sheet. The majority of the small firms appears to have had recent experiences with Superfund, with nearly 70 percent of the PRPs (or third party defendants) being named in the last five years, and 30 percent named during the 1983 to 1988 period. In addition, over half of the respondents owned the firm at the time that most of the activity for which they were named a PRP occurred.

Thus, the data represent a cross section of small firms, with potential, yet undetermined, legal liability, for being small contributors to industrial sites. Also, the majority of the businesses have recently been designated a PRP and owned the firm when most of the Superfund related activity took place.

III. EMPIRICAL RESULTS

The analysis and discussion that follow cover six indicators of the economic impact of Superfund PRP status on smaller firms. Indicators include sales, employment, access to bank credit and trade credit, capital investment decisions, and demands on management time. The analysis highlights the degree to which Superfund PRP status has affected these key economic indicators and contrasts differences in the extent of the effect of PRP status

on these variables. The analysis distinguishes between the likely short-term and long-term impact of PRP status. Smaller firms are defined as firms with 500 employees or less, and 88 percent of the respondents (457) fall in this category. It is this set of small firms that are the focus of this study and thus, all firms with more than 500 employees are eliminated from the analysis. Using two-way frequency distributions, differential effects related to firm size are identified.

Short-Term Impact

Sales are the driving force behind all business activity. Employment, capital expenditures, and debt and equity investment are driven by current and expected future revenues. The survey requested PRPs to report sales growth expectations prior to being named a PRP, actual sales growth one year after being named a PRP, and how much of the difference, if any, could be attributed to being named a PRP. As indicated in Table 1, approximately half of the small firms expect virtually no growth in annual sales prior to being named a PRP. In contrast, 68 percent of the firms experience either no growth or a declining sales pattern after achieving the PRP status. Also note from Table 1 that in all cases where firms expect annual sales to increase, the realization is less than the projection.

In a related question concerning the difference between actual and projected sales, 80 percent of respondents report either "no difference in projected and actual sales" or that being named a PRP "made no difference in sales." Twenty percent attribute some of the difference to PRP status. The

Table 1
Sales Growth

Sales Growth Rate	*Expected (n = 356)*	*Actual (n=335)*
Decline >5%	NA	26%
No Growth (± 5%)	52%	42%
	52%	68%
Increase 5% to 9%	28%	23%
Increase 10% to 14%	14%	6%
Increase 15% to 24%	5%	3%
Increase ≥ 25%	1%	1%
	100%	100%

20 percent included 13 percent attributing less than 25 percent of the difference to PRP status and seven percent attributing 25 percent or more of the difference to PRP status.

Since 73 percent of respondents were named PRPs between 1986 and 1993, it seems reasonable to conclude that much of the difference between expected and actual sales may be the result of the recession that occurred during that time period. In some indefinable way, the fact that the majority of PRP's (80%) did not blame PRP status for disappointing sales lends credibility to the objectivity of their response to the survey. While 20 percent in itself is a nontrivial number, it is also worth noting that the adverse impact of PRP status on the difference between expected and actual sales growth is related to company size. The smaller the firm, the greater the percentage who consider PRP status as the reason for these less than projected sales growth figures.

As an additional measure of the short-term impacts of Superfund, the small firms in the study state the change in their total employment after being named a PRP at a Superfund site. One year after being named a PRP, 26 percent of the sample employ fewer people than they did prior to being named a PRP. The number of firms cutting payrolls is consistent with the fact that 26 percent of the respondents reported a decline in sales (Table 1) over the one-year period within which they were named a PRP. Not consistent with the sales change data is the fact that one year after being named a PRP, one-third of the sample firms reported increased revenues (Table 1), but only 13 percent added employees. Firms in the sample were quicker to reduce payrolls as sales declined than to increase payrolls as sales rose. Hiring decisions tend to be based on long-term growth expectations and the ability to finance growth. If management anticipates that PRP status will have a material adverse effect on access to the capital required to finance growth, it is likely that PRP status played a part in the hiring decisions of the growing firms in the sample. Since comparable data is not available for nonPRP small firms, the degree to which this fire/hire pattern can be attributed to respondents' PRP status cannot be ascertained. Nevertheless, the pattern is consistent with expected management response to the uncertainty of PRP liability.

In the aggregate, vendors are the largest providers of short-term credit for smaller firms (Longenecker, 1991). Therefore, any events that adversely affect trade credit could have a significant impact on smaller firms' ability to finance growth and create jobs. It appears from the sample data that PRP status had little immediate effect on the amount of trade credit provided by vendors. Only seven percent of respondents (27 firms) reported that PRP status adversely affected the amount of trade credit provided by vendors. While the absolute numbers are small, there is a relationship between the

effect of PRP status on trade credit and firm size. The percentage of firms with 0–19 employees that indicate a reduction or total withdrawal of trade credit is four times as large as those firms with 100–500 employees (14% vs 3%). The effect of PRP status on vendor credit terms (due date) is smaller than the effect on the amount of trade credit, with 96 percent of the firms indicating no change in the net due date.

Speculation about reasons behind the limited short-term effect of PRP status on both the amount and terms of trade credit include the following possibilities: vendors are unaware of customer's PRP status, vendor credit is very short-term credit (typically 30 days), vendor credit seldom covers more than 30–45 day purchases, out-of-pocket exposure is limited to the variable costs embedded in products shipped or services rendered (substantially less than invoice price), or profit margins are typically large enough to cover vendors' perceptions of the incremental risks associated with customer PRP status. However, the minor short-term effect may understate the long-term effect of PRP status on access to trade credit. For small firms, designation as a PRP results in a "Special Event" notice to Dun & Bradstreet (*D&B*) subscribers and the withdrawal of a firm's *D&B* credit rating (Davies, 1993). A "no rating" status by *D&B* says to creditors—"You judge for yourself." This *D&B* "no rating" status and disclosure in *D&B* credit reports of a firm's PRP liability is likely to have a more material effect on access to credit from new vendors, with no credit history to use as a guide, than on relationships with existing vendors. It is reasonable to expect that the adverse effect of PRP status on access to trade credit will grow as time goes on or until a firm's PRP liability is established.

Bank credit ranks second to trade credit as a source of short-term financing for small firms. Survey recipients were asked to report on the effect of PRP status on the amount and the terms of credit accommodations provided by their bankers. Table 2 summarizes the responses concerning the effect of PRP status on the amount of credit made available by their bankers. Twenty percent of all respondents reported that PRP status affected the amount of bank credit provided by their bankers. Of these 20 percent, four percent indicate that all credit is withdrawn and the remaining 16 percent experience either a reduction in, or a refusal to increase, bank credit. When these impacts are categorized according to firm size, it appears that as the size of the firm decreases, the percentage of firms who experience an adverse effect on the amount of bank credit increases.

It is difficult to reconcile the 80 percent for whom PRP status had no effect with the implications of widespread anecdotal evidence suggesting that PRP status typically leads to the withdrawal of all bank credit accommodations. However, a different picture emerges with respect to the effect of PRP status

Table 2
Bank Credit—Amount
(n = 355)

Effect		*Percent*
No effect		81%
Credit increase refused	7%	
Reduced 1%–24%	4%	
Reduced 25%–49%	2%	
Reduced 50%–99%	2%	
	4%	
All credit withdrawn		19%
		100%

on the terms of bank credit. Respondents provided information concerning the effect of PRP status on the terms of their bank credit accommodations. One hundred forty-seven firms reported that PRP status affected their bank credit terms, which is more than twice the number of firms (69) that reported that PRP status affected the amount of their bank credit. Note from Table 3 that bankers typically did not respond to the increased risk of lending to PRP accounts by raising interest rates (the explicit cost of credit), but by imposing terms and conditions designed to reduce credit risk exposure. These terms and conditions are not cost free to borrowers. They represent implicit costs that in indirect, nonquantifiable ways impose constraints on management's ability to make otherwise optimal business decisions and/or attract capital from other sources.

Table 3
Bank Credit—Terms
(n = 147)

Effect	*Percent*
Increased collateral required	37%
Required a personal guarantee	41%
Raised the interest rate	13%
Other	9%
	100%

Long-Term Impact

The sales, employment, bank credit, and trade credit issues tend to reflect the short-term impact of PRP status. Given the country's reliance on smaller firms for new products and new jobs (Cognetics, 1993; Hale, 1992; Light, 1993), the longer term impact on smaller firms' ability to raise capital, invest in plant and equipment, and generate new revenues and new jobs takes on particular significance.

To address these long-term issues respondents are asked whether any planned investments in plant and/or equipment are postponed or canceled as a result of being named a PRP. Investing in long-term assets reflects management's expectations for future cash flow generating revenues and the availability and cost of long-term debt and equity capital. Based upon responses to questions dealing with plant and equipment decisions (Table 4), it appears highly likely that the long-term impact of PRP status on the ability of smaller firms to raise capital and create jobs will be substantially greater than the short-term impact. Specifically, 39 percent of the small firms reduced or delayed their investment in plant and equipment as a result of being named a PRP. This figure is twice the percentage of respondents that attributed the difference between expected and actual sales one year after being a PRP to their PRP status. In addition, the impact of PRP status on plant and equipment decisions is related to company size. Approximately half of the firms with 0–19 employees postponed or canceled plant and equipment expenditures as a result of their PRP status, as opposed to a quarter of the firms with 100–500 employees. The size and uncertainty of PRP liability can be expected

Table 4
Investment in Plant and/or Equipment
(n = 371)

Effect		*Percent*
No change in planned investment		61%
Moderate (5%–39%) reduction in planned investment	21%	
Major (40%–89%) reduction in planned investment	11%	
All (90%–100%) investment postponed or delayed	7%	
Total investment reduction		39%
		100%

Table 5
Required Returns from Investment Projects
(n = 337)

Effect		*Percent*
No impact		74%
Increased required rate 5%–9%	11%	
Increased required rate 10%–14%	5%	
Increased required rate 15%–24%	4%	
Increased required rate 25%–49%	2%	
Increased required rate 50% or more	4%	
Total increase		26%
		100%

to have an increasingly adverse impact on smaller firm PRPs as time goes on. In view of the fact that respondents appear to have replied honestly to the survey, being named a PRP could have a material long-term adverse effect on the most productive job generating segment of the economy.

Required rates of return on capital investments (hurdle rates) reflect management's perceptions of the availability and the explicit cost of long-term debt and equity capital. Respondents are asked about the effect of potential Superfund liability on the expected rates of return required from new investment projects (Table 5). Fully one quarter of all the small firms indicate an increase in their required rate of return, and of these, 11 percent state that their Superfund liability results in an increase of between five and nine percent in the rate. The impact of PRP status on hurdle rates is also related to firm size, with twice as many smaller firms (0–19 employees) experiencing an increase in the hurdle rate than the corresponding larger firms (100–500 employees).

It appears that respondents deal with the impact of PRP status on investment decisions partly through increases in required rates of return and partly through more subjective decision criteria. In any event, the effects of the burden of PRP status will manifest themselves over an extended period of time as the consequences of delayed capital investment impact the competitive position of smaller firm PRPs. With 40 percent of respondents delaying capital spending, the long-term effects are likely to exceed the short-term effects by a substantial margin.

Limitations on the breadth and depth of management staff are among the most severe resource constraints confronting smaller firms. One senior management day per month is a nontrivial diversion of this resource. Table

Table 6
Management Time Devoted to Superfund Issues
($n = 449$)

Senior Management Time	*Percent*
None	14%
1% to 5%	52%
6% to 10%	16%
11% to 15%	8%
16% to 20%	3%
20% or more	7%
	100%

6 summarizes the issue of the diversion of senior management time. During the last five years, 52 percent of respondents devoted from one to five percent of senior management time to Superfund related issues. Another 35 percent spent more than five percent of senior management time on Superfund issues. By any definition, PRP status had a "material" impact on senior management time for 87 percent of respondents. This question attracted a 98 percent response rate, the highest response rate of all survey questions. Senior management is responsible for long-term strategic decisions. As is true of delayed capital expenditures, the adverse consequences of management attention diverted to PRP issues will be felt over an extended period of time.

IV. EVALUATING THE SURVEY BIAS

Inherent in any mail survey is the potential for nonresponse bias and a bias in the quality of the responses from those firms who returned the survey. The quality bias is especially important to assess when the survey instrument addresses a volatile issue such as Superfund liability. As a means of assessing the degree and impact of this inherent bias several strategies are adopted. To address the quality of the data, the demographics of the responding firms are compared to corresponding national averages. To ascertain the quality of the responses, a subjective evaluation of the appropriateness of the responses is undertaken. To estimate the degree of nonresponse bias, a postcard is sent to the nonrespondents, soliciting the reasons why the firm did not respond to the survey.

Table 7
Firm Size

Number of Employees	*Responding Firms*		*National Average**	
	Percent	*Cumulative Percent*	*Percent*	*Cumulative Percent*
0–19	33%	33%	83%	83%
20–99	34%	67%	10%	93%
100–499	21%	88%	3%	96%
500 or larger	12%	100%	4%	100%

**Source:* Birch (1987).

Three demographic characteristics of the respondents are analyzed: size, location, and sales patterns. Table 7 compares the size of the 520 responding firms, as measured by the number of employees, with the corresponding national levels.

As indicated in Table 7, the small firms in the sample (those firms with less than 500 employees) compare favorably with corresponding total U.S. figures, indicating a representative sample of firms with respect to employee size. Note from Table 7 that the sample underestimates the number of firms with less than 20 employees, and overestimates those small firms in the 20–499 category. These discrepancies may be due to the Superfund liability system, but in the absence of reliable national data on the size of PRPs, this conjecture cannot be ascertained. However, in the aggregate, the sample appears to successfully capture the small versus large firm dichotomy that exists in the U.S.. An analysis of the geographical distribution of the sample indicates that the responding firm's principal place of business represents 45 states and 430 zip codes. The largest concentration of respondents in any one state is six percent of the sample. Thus, it appears that the sample represents a geographically diverse set of firms with little or no regional bias. An analysis of the annual sales growth patterns of the responding firms identifies a sample of small firms that are congruent with national profiles. The majority (84%) of the small firms in the sample exhibit little, if any, growth in sales. These "life-style" ventures, defined as family owned firms driven by life-style motives of the owner, typically account for 90 percent of all start-up ventures in the U.S.. Seven percent of the sample firms indicate an annual sales growth in excess of 15 percent. These entrepreneurial firms, commonly defined as firms with annual growth of 15 percent or more, account for the majority of the job growth in the U.S. and typically represent between five and 10 percent of the total population of small firms (Cognetics, 1993). These annual sales

growth patterns of the respondents accurately represent those of the U.S. small firm population and thus, there appears to be no bias in the sample with respect to sales characteristics. In summary, an analysis of the demographic characteristics (size, location, and annual sales growth) of the responding firms indicates that the sample appears to be representative of the U.S. population of small firms, at least according to the three dimensions analyzed.

As a means of assessing the quality or objectivity of the survey responses, an analysis of aggregate responses is undertaken. The hypothesis operating in this analysis is that, in dealing with a volatile issue such as Superfund liability, the respondents may exhibit a tendency to attribute a majority of the difficulties in operating a small firm to the PRP status of the firm. Thus, in a sample where Superfund liability is the dominant reason for an unfavorable bottom line, the accuracy of the responses in measuring the true impact of Superfund liability is suspect. As stated earlier, 80 percent of the respondents indicate that PRP status has no effect on their respective sales growth patterns. Considering the fact that the majority of the respondents indicate that their actual sales growth after being named a PRP is less than the expected sales growth prior to being named a PRP, only enhances the quality of the responses. Similar response patterns exist with respect to other dimensions. Eighty-one percent of the respondents state that Superfund liability has no effect on the amount of bank credit provided by their bankers and over ninety percent attribute no effect of PRP status to both the amount and terms of their trade credit. To further assess the accuracy of the survey, the respondents are segmented into those exhibiting little or no growth in annual sales and those firms with annual growth in excess of five percent. Comparing the responses of these two groups indicates that in most cases the nongrowth firms are more likely to state that PRP status has no effect on sales growth, bank and trade credit, than the corresponding growth firms. Thus, it appears that the survey respondents exhibit little or no tendency to attribute certain operating difficulties to Superfund liability. That is, in facets of the business where Superfund liability does not effect operations, respondents are forthright in stating this conclusion. Likewise, it is assumed that this established credibility in the responses can also be extended to those situations where PRP status can be attributed to some of the difficulties that the firm is experiencing.

In an attempt to elucidate the nature of the nonresponse bias, a postcard was sent to all of the 4480 nonrespondents, soliciting information as to why the firm did not respond to the survey. Five hundred and seven postcards were returned, representing an 11 percent response rate. The respondents were given several alternative reasons from which to choose for not complet-

ing the survey, in addition to questions concerning the effect of Superfund on their business and the number of employees. Small firms (those employing less than 500 people) represent 77 percent of the respondents, with the remaining 23 percent representing large firms. Recall that in the original survey 12 percent of the sample consisted of large firms. Thus, the nonrespondents represent a larger portion of the large firms than in both the original survey and in the U.S. population. Since these large firms are not the focus of the current research, it is encouraging to note that it appears that firms with 500 or more employees constitute a larger portion of the nonrespondent population than would normally be expected.

For those small firms who returned the postcard, the most frequent reason cited (35 percent of the respondents) for not responding is that the individual did not recall having seen the original Superfund survey. In the context of the present study, it is conceivable that only 65 percent of the surveys reached the intended party. While the reasons for this result cannot be ascertained with certainty, one plausible explanation lies in the situation that all Superfund related correspondence is, in many instances, routed directly to the representing law firm, and as such, the survey would not have reached the intended target. Even allowing for limited recall among the recipients, it is conceivable that the true response rate for the survey is somewhat higher than previously stated, since it appears that the number of surveys mailed may overstate the number of potential respondents. The next largest group of nonrespondents (25%) state that because the effects of Superfund on their business are too hard to quantify, they chose not to complete the survey. While this response does not give an indication of the magnitude of the potential effect of Superfund liability, it does, by inference, indicate that there are certain nonquantifiable effects. Considering the two largest response categories, nearly 60 percent of the respondents indicate that they did not see the survey or the effects of Superfund as too hard to quantify. Taken collectively, these two responses, in part, tend to mitigate any serious consequences of the nonresponse bias.

The remainder of the questions as to why the firm did not respond to the survey are considered pertinent by less than 20 percent of the respondents. The reasons cover such factors as: surveys take too much time (21 percent of the respondents), a concern about the confidentiality of their response (15%), no knowledge of Superfund (14%), and a request by legal counsel to not respond (10%).

While an analysis of the reasons for nonresponse does not indicate that the impact of Superfund liability on small business is any larger than stated, the responses most certainly lend support to the conclusion that the impact is not overstated. Also, the above results tend to discredit the argument that

those firms that responded to the original survey disproportionally represent only those firms that were affected by Superfund and that the vast majority of nonrespondents are unaffected by Superfund. In essence, the postcard responses indicate that quite the contrary may be true—that the effects of Superfund on small business are at least, but possibly larger than, the impacts estimated in this study. In further support of this conclusion, firms were asked if Superfund has had a significant impact on their business. Nearly half of the small firms (46%) answered a resounding yes. While the magnitude of the effects on the nonrespondents cannot be quantified from the postcard, support has been provided for the existence of significant impacts and as such, the effects of nonresponse bias appears to be mitigated.

V. CONCLUSION

Results of the research do not support prevailing anecdotal evidence suggesting that PRP status has an immediate and devastating impact on smaller firms. However, comparison of empirical research with anecdotal evidence is largely an irrelevant exercise. The more appropriate questions involve the effect of Superfund liability on the long-term power of smaller firms to continue their role as the job generating engine in our economy.

Survey data suggest that PRP status has a measurable, but limited, short-term effect on sales. The short-term effect on trade credit is inconsequential. However, the withdrawal of *D&B* credit ratings from small firm PRPs will certainly limit access to future trade credit. The immediate effect of PRP status on the amount of bank credit available to small firms is also limited. Banks appear to have responded to borrowers' PRP status by imposing risk reducing terms and conditions rather than by curtailing credit or raising interest rates. The survey did not directly address PRPs' access to future bank accommodations. However, it seems reasonable to expect that once terms and conditions have been imposed to protect existing credit relationships, access to future bank credit will be sharply curtailed, especially long-term plant and equipment credit required to finance growth.

The most significant and disturbing implications of the research lead to conclusions about the long-term impact of PRP status. The uncertain and potentially ruinous costs of Superfund liability concentrate management's attention and company resources on short-term survival at the expense of long-term growth. This is a particularly troubling consequence in view of the dominant role smaller firms play in generating new jobs and the fact that the smaller the firm the more severe the impact of PRP status.

Senior management is responsible for determining a firm's long-term market strategy and for attracting and managing the resources required to attain long-term objectives. Over half of the PRP respondents devote up to one day per month of senior management time to Superfund issues. Another 35 percent devote more than one day per month to Superfund issues. The effect of PRP status on the use of senior management time is impossible to measure. However, it can be said with certainty that the effect of PRP status on a firm's long-term competitive position will not be positive. Two indicators tend to confirm this conclusion. The first indicator is the pattern of respondents' hiring decisions after being named a PRP. Firms with declining revenues were quick to cut payrolls while firms with growing revenues were slow to add to payrolls. Both behavior patterns suggest a greater concern for short-term survival than for long-term growth. A second measure of the impact of PRP status on long-term performance can be found in its effect on plant and equipment investment decisions. Forty percent of small firm PRPs reported that their plant and equipment expenditures were reduced or postponed as a result of PRP status. This outcome is not surprising. It is further evidence that the size and uncertainty surrounding PRP liability concentrates management's attention on short-term survival rather than long-term growth. Creditors and equity investors will likewise be more concerned about survival than growth. Unless and until final PRP liability is established, smaller firms will be obliged to conserve scarce resources to ensure survival, thereby foregoing the commitments that lead to long-term growth.

What can be done to minimize the impact of Superfund PRP status on smaller firms? Under the current liability system, determining final PRP liability is an extended and expensive process. By some estimates, as much as 70 cents of every dollar of Superfund related expenditures is consumed by legal and consulting fees. Smaller firm PRPs have identified the present liability system as the dominant Superfund problem. From the point of view of smaller firms, equitable and expeditious determination of final Superfund liability should be the primary goal of modifications to the implementation of Superfund.

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REFERENCES

Birch, D.L. (1987). *Job creation in America.* New York: The Free Press.

Cognetics, Inc. (1993). Who's creating jobs?. Cambridge, MA: Author.

Davies, A. (1993, September). Manager, Dun and Bradstreet public documents department [Interview with authors].

Hale, M. (1992, August 10). For new jobs, help small business. *Wall Street Journal,* p. 810.

Light, L. (1993, March 1). Small business: The job engine needs fuel. *Business Week,* p. 78.

Longenecker, J.W., & Moore, C.W. (1991). *Small business management: An entrepreneurial emphasis* (8th ed.). Cincinnati, OH: South-Western Publishing Co.

Porter, J.W., & Jones, W.J. (1993). *Superfund facts.* Sterling, VA: Porter & Associates.

Portney, P.R. (1992). The economics of hazardous waste regulation. In D. Brodsky (Ed.), *U.S. waste management policies: Impact on economic growth and investment strategies.* Washington, D.C.: American Council for Capital Formation Center for Policy Research.

Russell, M., Calglazier, E.W., & English, M. (1991). Hazardous waste remediation: The task ahead. Knoxville, TN: University of Tennessee.

U.S. Environmental Protection Agency. (1988, September). Impacts of environmental regulations on small business office of policy, planning and evaluation (Document number EPA-230-09-88-039). Washington, DC: Office of Policy, Planning, and Evaluation.

U.S. Environmental Protection Agency. (1990, November). Environmental investments: The cost of a clear environment (Document number EPA-230-12-90-084). Washington, DC: Office of Policy, Planning and Evaluation.

Vig, N., & Kraft, M. (1990). Environmental policy in the 1990s. Washington, D.C.: CQ Press.