

SECTION 301(a)(1) OF THE COMPREHENSIVE ENVIRONMENTAL  
RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980  
(CERCLA or SUPERFUND)

A Report to Congress on the Environmental Protection  
Agency's Experience With Implementing Superfund

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## CERCLA 301 STUDY EXECUTIVE SUMMARY

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA or Superfund) provides the President with broad authority to respond to the release of hazardous substances into the environment. This broad authority permits the President to finance the cleanup of hazardous substance releases with funds from the \$1.6 billion Hazardous Substance Response Trust Fund (Fund) or to require responsible parties to finance cleanup action. Fund money is derived from taxes levied on certain petrochemicals, inorganic raw materials, as well as domestic crude oil and imported petroleum products. Under Executive Order 12316, the President delegated primary responsibility for implementing CERCLA to the Environmental Protection Agency (EPA).

Section 301(a)(1) of CERCLA requires the President to submit a comprehensive report to Congress on experience with implementing Superfund. Sections 301(a)(1)(A) through (I) require that the report address at least nine separate issues including the effectiveness of the Superfund program, income into and expenditures from the Fund, the extent of the hazardous substance release problem, alternative tax schedules for financing the program, and the economic impacts of the current tax on the nation's balance of trade. The "301 study" has been designed as seven separate studies to fulfill the mandate under section 301(a)(1) of CERCLA.

The general purpose of the "301 study" is to provide information to Congress and other interested parties on EPA's experience in implementing Superfund. In particular, the study provides important information to assist Congress in developing a new bill to reauthorize the program. Reauthorization is necessary because the authority to collect taxes to finance Superfund activities expires September 30, 1985.

The executive summary highlights the major findings or conclusions of each study. The 301(a)(1)(A),(C),(F), and (G) studies are presented first because they are considered to be the most important. The "A" study describes the current program and evaluates its effectiveness in carrying out the CERCLA mandate. The "C" study examines the extent of the hazardous substance release problem by discussing the scope of the current program, estimating future funding needs, and examining the potential for expanding the focus and character of the current program. The "F" study examines the impacts of the current tax on the Nation's balance of trade with other countries. The "G" study presents options for designing a new CERCLA tax to finance Superfund after expiration of the current tax authority.

### 301(a)(1)(A) -- EFFECTIVENESS OF THE SUPERFUND PROGRAM

Section 301(a)(1)(A) of CERCLA requires a study which examines "the extent to which the Act and [the Hazardous Substance Response Trust] Fund are effective in enabling Government to respond to and mitigate the effects of releases of hazardous substances." The "A" study describes how EPA has conducted the three major components of the Superfund program -- removal, remedial, and enforcement actions. The study discusses EPA's goals and policies associated with each of these three activities, analyzes how the goals and policies of these activities have changed over time, and presents the Agency's accomplishments in light of these changes.

Goals and Policies. The general goal of the Superfund program is to provide a timely and cost-effective response to the release of hazardous substances to ensure adequate protection of public health, welfare, and the environment. Three separate but often interrelated components -- removal, remedial, and enforcement -- have been designed to enable EPA to achieve this goal. The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) provides the regulatory framework for implementing the three major components of the Superfund program.

Section 104 of CERCLA authorizes both removal and remedial actions. The removal program is designed as a quick response program for abating or minimizing an immediate threat resulting from the release of hazardous substances into the environment. Removal actions are limited in scope by section 104(c)(1) of CERCLA to \$1 million in costs and six months in duration, unless specific exemption criteria are met. CERCLA does not define a role for State participation in removal activities.

The remedial program is designed as a longer-term response program that addresses the most serious hazardous release problems and provides the most extensive cleanup. A remedial action must be consistent with a permanent remedy and is taken in lieu of, or in addition to, removal actions to prevent or minimize the effect of migrating substances on present or future public health, welfare, or the environment. States are required to pay 10 percent of the cost at privately-owned sites and at least 50 percent of the costs at publicly-owned sites. States may also take the lead in conducting remedial actions. Remedial actions cannot, however, be undertaken until the State and EPA implement a formal agreement that defines respective roles and responsibilities in conducting such action.

The remedial program has two distinct phases. The first phase is site discovery and investigation. During this phase, EPA identifies and investigates potential hazardous releases, scores sites using the Hazard Ranking System (HRS), and lists those sites with a score of 28.5 or more on the National Priorities List (NPL). The second phase is planning and implementation of remedial cleanup activities. Only those sites listed on the NPL are eligible for Fund-financed remedial actions. This phase includes developing an agreement between EPA and the State governing site actions, initiating and preparing the remedial investigation and feasibility study, selecting the preferred cleanup remedy, and designing and constructing the remedy.

The enforcement program is designed to compel responsible parties to finance and conduct appropriate response actions, and to recover the costs of removal and remedial response actions financed with CERCLA funds. Sections 106 and 107 of CERCLA form the basis of this enforcement authority. Section 106 authorizes the use of administrative orders or the pursuit of civil actions to compel responsible parties to undertake cleanup action. Section 107 makes responsible parties liable for the costs incurred by Federal or State Governments or private parties that conduct response actions consistent with the NCP.

Negotiation with potentially responsible parties is an important part of the enforcement process. Negotiations are conducted either to secure respon-

sible party action to fund or conduct cleanup, or to recover CERCLA funds already expended. Negotiations for removal actions are of relatively short duration. Negotiations for remedial actions are generally of longer duration and may take place before, during, or after a response action, depending upon site circumstances as well as the nature and immediacy of the threat. EPA makes a site-by-site determination on whether to pursue negotiations or Fund-financed cleanup. The need for prompt response affects this determination.

The three major components of the Superfund program are interrelated in several ways. For example, at some sites a removal action may constitute a final action to abate a threat. At other sites removals may be conducted prior to or concurrent with a remedial action to stabilize conditions on-site, while more extensive remedial actions are being planned or carried out. Similarly, EPA may conduct preliminary assessments or investigations to determine that removal or remedial actions are necessary, but may secure responsible party agreement to conduct such action through the negotiation process before or during Fund-financed actions. Finally, negotiations or enforcement actions may be necessary after a removal or remedial action is completed to recover CERCLA funds used to finance such action.

Policy Changes. The Superfund program has undergone major policy changes during the past four years which have significantly affected the implementation and accomplishments of the program. Some changes evolved from the Agency's growing experience in addressing the hazardous substance release problem and in implementing a new program. Other changes resulted from a major reevaluation of the program undertaken in the spring and summer of 1983. These policy changes resulted in significant shifts in approach and emphasis in the Superfund program.

Policy changes which have significantly affected the operation of the Superfund program include changes with respect to responsible party negotiations, States' cost-sharing requirements, the pace and scope of removal actions, overall program management, and community relations. These policy changes are briefly discussed below.

The most significant change that occurred in 1983 was a shift from EPA's policy of negotiating with responsible parties prior to CERCLA response action to more prompt use of Fund resources and formal enforcement measures to expedite responses to hazardous substance releases. The initial emphasis on negotiations to achieve responsible party cleanup was designed to conserve Fund resources for responses at sites with no potential responsible parties or where enforcement efforts had failed. This policy, however, led to significant delays in achieving cleanup. EPA, therefore, developed a new approach: initiating Fund-financed response more promptly for both removal and remedial actions; targeting enforcement resources on those sites where there is a greater likelihood of successful action; and participating in a formal enforcement process which moves from negotiation to civil or administrative enforcement in a reasonable timeframe.

A second policy change that affected the Superfund program related to the timing of the States' cost-sharing requirement for remedial actions. Initially,

States were required to provide their ten percent cost-share during the planning stage (i.e. remedial investigations and feasibility studies) of the remedial response. This meant that States were required to commit funds prior to the determination of the extent and cost of cleanup. Significant delays in initiating responses occurred in instances where States were unable to provide their required cost-share. In light of this problem, EPA shifted Agency policy to require State cost-sharing only during the implementation of the cleanup.

A third important policy change affected the pace and the scope of the removal program. During the first years of the program, EPA initiated Fund-financed removal actions only in urgent situations. The emphasis was on encouraging States and responsible parties to undertake removal actions. EPA now permits removal actions to occur at sites with potential as well as existing threats. EPA had also initially limited the scope of removal actions at NPL sites to small-scale stabilization actions to reduce only the most imminent hazards (e.g. fires and explosions). EPA policy was changed to encourage removals at NPL sites that involve a more extensive surface cleanup to prevent the need to conduct subsequent stabilization actions.

A fourth policy change affected general Superfund program management. During the first years, decision-making and approval authority for Superfund actions were centralized at the EPA headquarters senior management level. Since the spring of 1983, EPA has decentralized the program by delegating decision-making and implementation authority to Regional Offices. This decentralization has shortened the timeframe for approval of removal and remedial actions and has eliminated burdensome steps in the process.

A fifth policy change affected the community relations program. EPA initially encouraged flexibility in tailoring community relations activities at each site. By 1982, EPA determined that a more formal structure for conducting community relations would improve the ability of the program to provide the public with an opportunity to contribute to the decision-making process and to channel information to and from the public. This policy requires: the development of a site-specific community relations plan to identify on-going communication activities with the community; a review by the public of site studies and alternative remedies under consideration by EPA; and a summary of EPA's response to the public's concerns.

Accomplishments of the Superfund Program. The pace of the Superfund program was initially slow. Over the past two years, however, program activities and accomplishments have grown.

EPA has established the Emergency and Remedial Response Information System (ERRIS) which contains information on approximately 19,000 potential hazardous waste sites. EPA has devoted a considerable amount of resources to investigating these sites to determine whether they pose an imminent and substantial danger to public health, welfare, or the environment that warrants removal or remedial action.

Through FY 1984, EPA has completed preliminary assessments at more than 10,700 sites as well as site inspections at approximately 3,600 sites. The Hazard Ranking System (HRS), which scores potentially hazardous sites according to their relative degree of hazard, has been used to score approximately 1,700 sites. Sites scored by the HRS that meet specific criteria are then placed on the NPL for potential remedial action. As of May 1984, EPA had placed 410 sites on the NPL. In September of 1984, the NPL was updated to include 128 additional sites. The second NPL update, announced in October of 1984, proposes to add an additional 244 sites to the list. Only those sites listed on the NPL are eligible for Fund-financed remedial action.

Through FY 1984, EPA and the Coast Guard initiated 472 removal actions, 329 (78 percent) of which were initiated in FY 1983 and FY 1984. The cost of these actions was more than \$87 million. These figures indicate the dramatic increase in the pace of the removal program during the past two years. The level of removal activity is particularly important since removal actions are the mechanism EPA uses to respond to sites which pose the most significant threat to public health, welfare, or the environment. Removal actions may be taken at those sites not eligible for longer-term remedial action (i.e. non-NPL sites) or at NPL sites requiring short-term immediate responses.

In addition to direct Fund-financed removal actions, EPA and the U.S. Coast Guard monitor short term cleanup actions by the States and responsible parties. EPA encourages and assists these non-Federal response efforts. EPA also monitors these activities to ensure that appropriate cleanup action occurs. If responsible parties or the States fail to respond adequately, EPA may assume cleanup responsibilities. EPA and the Coast Guard provide on-site monitoring at 300 to 500 sites per year.

The pace of the remedial program has increased significantly during Fiscal Years 1983 and 1984. Remedial action (i.e. construction of a "permanent" remedy) has been completed at only a few sites. Significant interim accomplishments, however, more accurately reflect efforts to undertake remedial responses. Fund-financed remedial investigations (RIs) and feasibility studies (FSs) are underway at 290 sites. Fund-financed remedial designs have been initiated at 34 sites, and construction has been initiated at 29 sites.

EPA's Superfund enforcement efforts also reflect significant accomplishments, especially during the past two years. For example, enforcement actions through the end of FY 1984 have resulted in responsible parties committing to undertake RI/FSs at 25 NPL sites and cleanup actions at 22 NPL sites. Total Fund-financed and responsible party RI/FS, then, have been initiated at 315 NPL sites, design at 56 NPL sites, and construction at 51 NPL sites.

Negotiations to gain responsible party cooperation in undertaking specific investigative or cleanup actions have resulted in 144 consent decrees and consent administrative orders, 100 of which were reached in FY 1983 and FY 1984. The value of these 144 settlements which resulted in both removal and remedial activities by responsible parties is valued at more than \$310 million.

EPA has also issued 111 unilateral administrative orders to compel private parties to undertake investigative or cleanup activities, 107 of which were issued in FY 1983 and FY 1984. In instances where responsible parties fail to comply with such orders, EPA may initiate treble damage suits. In addition, the Department of Justice (DOJ) has filed 72 civil litigation cases to compel responsible party cleanup.

The success of these enforcement efforts is encouraging and important in conserving Fund monies. EPA has demonstrated its commitment to seeking negotiated settlements when possible, but has also demonstrated the Agency's willingness to proceed with formal enforcement mechanisms when negotiations do not result in appropriate responsible party action.

Cost recovery of Fund-financed actions was initially slow. This was due to EPA policy that such actions be initiated once removal or remedial actions have been completed. Time is also required to secure adequate documentation and prepare cases for DOJ. Nevertheless, EPA has reached settlements or judgements resulting from 33 separate actions for a total of \$6.6 million. The 301(a)(1)(D) study discusses cost-recovery accomplishments and efforts in greater detail.

#### 301(a)(1)(C) -- EXTENT OF THE HAZARDOUS RELEASE PROBLEM AND FUTURE FUNDING NEEDS

Section 301(a)(1)(C) of CERCLA requires a study which provides "a projection of any future funding needs remaining after the expiration of authority to collect taxes, and of the threat to public health, welfare, and the environment posed by the projected releases which create any such needs." The "C" study provides the basis for determining long term funding needs for the Superfund program. In doing so, the study characterizes the nature of the hazardous substance release problem, examines the scope and future funding needs of the current program, as well as the potential for expanding the current scope of Superfund.

Threats Posed by Hazardous Substance Releases. Hazardous substance releases listed on the NPL are typically characterized by three factors: substances present at sites are inherently hazardous to health; routes of exposure to the substances exist; and target populations and environments are present that may receive exposure to hazardous substances.

The twenty-five substances most frequently found at NPL sites (including lead and PCBs) have widely differing toxicities. However, among the properties of these substances, nearly half are known or suspected carcinogens; seven are very toxic to aquatic life; nine are known to be mutagens; seven are known teratogens; and seven will ignite at room temperatures. Additionally, many sites contain hazardous substances that may work synergistically to cause or enhance a variety of toxic effects.

Scope of Superfund and Future Funding Needs. Over the past four years, EPA has made progress in discovering potential hazardous substance releases. Approximately 19,000 sites are now listed in EPA's hazardous substance inventory (ERRIS).

EPA has also made progress in investigating releases and listing the most serious ones on the NPL for potential remedial action. As of October 1984, 538 sites are listed on the NPL, with an additional 248 sites proposed for listing.

EPA expects that many of the sites that will be targeted for Superfund cleanup in the future will pose threats resembling those that are currently listed on the NPL. The current inventory of sites and anticipated new additions will produce an NPL of 1,500 to 2,500 sites over the next several years. EPA's baseline estimate, using current program experience, is that the NPL will increase to approximately 1,800 sites.

To address an NPL of 1,800 sites, with an average remedial cost of \$8.1 million and expected responsible party contributions of 50 percent of the cleanup costs, future funding requirements would total \$11.7 billion (FY 83 dollars). This estimate includes costs of remedial and removal responses, support and enforcement, as well as reimbursement to the Fund from responsible parties. The central estimate is based on the assumption that the scope of the Superfund program will remain similar to EPA's experience with the program to date.

Because of uncertainties in the projections, a central range of future funding needs is estimated as well. Depending on assumptions about the size of the NPL, the average cost of remedial action, and the level of responsible party contributions to cleanup actions, future funding needs could range from \$7.6 to \$22.7 billion, in FY 83 dollars.

Potential Expansion in the Focus of the Superfund Program. While EPA's response authority under CERCLA is extremely broad, these central estimates of funding needs are based on the assumption that the Superfund program will remain similar to EPA's experience with the program to date. The emphasis over the past four years has been on traditional hazardous waste sites and obvious release problems. More recently, however, the focus and character of the program appear to be expanding to include sites that will require more intensive discovery efforts as well as problems that are new to Superfund.

If EPA were to undertake a targeted, systematic discovery and investigation effort into these program areas, the size of the program could increase substantially. The emerging problem areas include the following:

- ° RCRA Subtitle C Facilities: Approximately 130 of 960 privately-owned land disposal facilities and approximately 475 of 3,520 privately-owned storage and treatment facilities are expected to close for financial reasons. As long as these facilities continue operating, RCRA provides sufficient authority to require owners and operators to control and cleanup hazardous substance releases. However, once the facility is inactive and if the owner does not have the financial capability to correct the problem, the facility may be a potential Superfund site. There are 45 RCRA facilities on the final and second update to the NCP.
- ° Municipal Landfills: Approximately 12,000 to 18,000 municipal landfills are currently operating, with up to twice as many that are inactive. Many of these received hazardous wastes prior to the RCRA notification



requirements and some still receive hazardous wastes of small quantity generators and households. There are currently 163 sites on the final and second update of the NPL that are classified as containing municipal refuse or as municipally-owned landfills.

- ° Industrial Landfills: Approximately 75,000 industrial landfills are currently operating, some of which contain and/or continue to receive hazardous wastes. There are 107 sites classified as commercial/ industrial landfills on the final NPL, and 27 more have been proposed for listing.
- ° Mining Waste Sites: Approximately 10,000 to 64,000 active and inactive mines may be of concern for Superfund. Mining wastes may include heavy metals such as lead, arsenic, and cadmium, radioactive materials, as well as asbestos. There are 15 mining wastes sites on the final NPL, and three more are proposed for listing. Ore processing and smelting operations are represented by an additional 16 sites on the final NPL, and one more has been proposed for listing.
- ° Leaking Underground Storage Tanks: There are approximately 11,250 to 187,500 non-petroleum sites with leaking underground tanks that contain hazardous substances. The 1984 RCRA Amendments regulate underground tanks through various notification, inspection, monitoring, and corrective action requirements. There are 34 underground tank sites on the final NPL, and 23 more have been proposed for listing.
- ° Contamination from Agricultural Uses of Pesticides: To date, at least 15 pesticides have been discovered in ground water in over twenty states. This source of contamination has occurred through the routine application of pesticides for agricultural use. There are six pesticide contaminated sites proposed for inclusion on the NPL.
- ° Radioactive Sites: The Nuclear Regulatory Commission (NRC) administers 8,900 materials licenses; agreement States administer an additional 13,000. EPA does not respond to radioactive releases from facilities holding a current materials license since NRC has adequate authority to control such releases. EPA does, however, consider former NRC licensees and State licensed facilities for NPL listing. There are 34 final and proposed sites on the NPL containing radioactive materials.

Until systematic identification and investigation of these different types of sites is undertaken, it is impossible to estimate the total number of sites that could become Superfund problems. However, even if a small fraction of these sites require Superfund response, the funding needed to address them would overwhelm the central estimates currently projected for the Superfund program.

Finally, it is possible that a large number of sites that have been investigated but that do not score high enough on the Hazard Ranking System may pose hazards that will need to be addressed by Superfund at some point in the future. These additional listings, like the above problem areas, have important implications for expanding the focus of the Superfund program.

301(a)(1)(F) -- THE IMPACT OF THE CERCLA TAX ON THE NATION'S BALANCE OF TRADE

Section 301(a)(1)(F) of CERCLA requires a study which analyzes "the impact of the taxes imposed by Title II of this Act on the Nation's balance of trade with other countries." This study examines the impact of the current tax as required by CERCLA. However, it also provides a framework for analyzing the foreign trade effects of various alternative taxes.

CERCLA imposes a tax on 11 petrochemicals, 31 inorganic raw materials, as well as crude oil and petroleum products. Approximately 87 percent of the revenues generated from this tax have been derived from taxes on the chemical raw materials referred to as feedstocks. The tax is imposed on both domestic and imported feedstocks but not upon imported intermediate and final products made from these basic feedstocks. Thus, the prices of domestically-produced intermediate and final products presumably reflect the CERCLA tax while foreign-produced products do not. Since chemical markets are generally price-competitive, this situation has implications for U.S. domestic and export markets. Exports represent a major market for many domestic chemical producers as well as a significant positive contributor to the U.S. balance of trade.

The "F" study has two objectives. The first is to determine whether the CERCLA tax has actually led to higher imports and/or lower exports due to an increase in prices resulting from the CERCLA tax. The second objective is to investigate the hazardous waste management policies of those countries whose chemical producers compete with U.S. producers. Knowledge of whether foreign competitors are required to absorb costs associated with releases of hazardous substances will contribute to an understanding of the relative burden imposed on U.S. producers.

Impact on Balance of Trade.

° Although the U.S. chemical trade surplus has narrowed since 1980, this reduction is small relative to the overall deterioration in the U.S. trade balance. More important, the U.S. has not lost market share in world chemical exports since the enactment of CERCLA. The U.S. has historically maintained a substantial surplus in chemical trade that amounted to a record \$12.1 billion in 1980, \$11.7 billion in 1981, \$10.4 billion in 1982, and \$9 billion in 1983. Despite this decline, the U.S. share in world chemical exports in 1983 -- 17 percent -- was the highest in more than 10 years.

° U.S. imports of CERCLA-taxed feedstocks exceed U.S. exports. The U.S. trade deficit in taxed feedstocks amounted to an average of \$725 million annually in 1980-1983. Most of the taxed feedstocks are net import goods, so that the effect of the current excise tax on the U.S. trade balance in feedstocks is unlikely to be significant because both imported and domestically produced feedstocks are taxed.

° Global recession, decontrol of U.S. crude oil prices, changes in exchange rates, and increases in foreign chemical production capacity overwhelm any potential effects of the excise taxes imposed by CERCLA on the U.S. balance of trade. These other economic factors generally influence trade markets in all sectors of U.S. industry and, thus, (1) are substantially more important

for explaining changes in the overall U.S. trade balance, and (2) make it difficult to isolate CERCLA's trade effects. For example, while the CERCLA tax represents less than one percent of the price of the majority of taxed feedstocks, the trade-weighted value of the dollar appreciated 61 percent relative to other currencies between 1980 and mid-1984.

° There is sufficient empirical evidence to conclude that the effect of the CERCLA tax on U.S. trade in the five intermediate chemicals studied -- cumene, styrene, ethylene glycol, acrylonitrile, and polypropylene -- has been insignificant compared to the effects of other economic factors. During the recessionary period of 1982 and early 1983, the percentage increase in price of these intermediate chemicals, assuming full pass-through of the feedstock tax, was of the same order of magnitude as on their feedstock inputs (approximately one percent). Recessionary conditions leading to low capacity utilization, imports from plants in feedstock-rich countries, and the strong dollar were the factors that affected the trade of these intermediate chemicals since the CERCLA tax was imposed. These recessionary conditions may also have contributed to the intermediates being priced near the cost of the feedstocks used to make them.

#### Foreign Hazardous Waste Management Policies.

° Organization of Economic Cooperation and Development (OECD) legislation and policy are guided by the "polluter pays" principle which suggests that the burden of pollution control should be borne by the polluter. Most countries have, however, found the principle difficult to implement due to the inability to identify the responsible party or inability of the responsible party to pay the costs of cleanup. Consequently, governments often assume the burden of financing corrective measures.

° There are laws in some OECD countries that address problems similar to those addressed by CERCLA. No other country has, however, adopted a CERCLA-type tax. Many countries have laws that are comparable to RCRA that establish policy on the control and management of hazardous waste, including transportation, treatment, storage, and disposal. There appears to be some movement toward a CERCLA-like tax in a few countries.

° Some OECD countries lag behind the U.S. in recognizing the problems of hazardous wastes and in instituting effective remedies.

° Legislative gaps between the U.S. and its OECD trading partners are narrowing. The European experience seems to be following the U.S. experience in that early environmental legislation covers primarily oil spills, water, and air pollution.

#### 301(a)(1)(G) -- THE FEASIBILITY AND DESIRABILITY OF ALTERNATIVE TAX SYSTEMS FOR SUPERFUND

Section 301(a)(1)(G) of CERCLA requires the development of a study which provides "an assessment of the feasibility and desirability of a schedule of taxes which would take into account one or more of the following:

- the likelihood of a release of a hazardous substance,
- the degree of hazard and risk of harm to public health, welfare, and the environment resulting from any such release,
- incentives to proper handling, recycling, incineration, and neutralization of hazardous wastes, and disincentives to improper or illegal handling or disposal of hazardous materials,
- administrative and reporting burdens on Government and industry, and
- the extent to which the tax burden falls on the substances and parties which create the problems addressed by this Act."

The "G" study is essentially a study of alternative tax options that could be used to finance the Superfund program. The study examines the feasibility and desirability of five alternative taxes with regard to six evaluative criteria. The tax options are designed to raise \$1 billion annually. This revenue target was chosen for illustrative purposes only and is used to ensure comparability among options. The choice of a revenue target, specific tax rates, taxable substances, and tax exemptions were necessary to conduct the analysis, and do not constitute an EPA recommendation about an appropriate CERCLA tax.

The five tax options are derived from three general tax structures: a feedstock tax, a waste-end tax, and a combination feedstock/waste-end tax. A feedstock tax (e.g. the tax imposed under CERCLA) is imposed at the beginning of the production process on the raw materials used to make the chemical products associated with hazardous substance generation. A waste-end tax is imposed late in the production process on the generation, transportation, treatment, storage or disposal of hazardous wastes. A waste-end tax may be collected from either generators or managers of treatment, storage, and disposal facilities. A combination tax is imposed on both chemical raw materials or feedstocks as well as on the generation and management of hazardous wastes.

The following highlights the tax options evaluated in this study:

- Feedstock Tax I (Modified Rates) is a feedstock tax that increases the existing CERCLA tax rates on the 43 substances identified in section 221 of CERCLA. The existing tax rates were multiplied by 3.43 to raise the level of revenue over a five year period from \$1.6 to \$5 billion. This feedstock tax, like the current CERCLA tax, is imposed at the beginning of the chemical production process and is levied on the raw materials and primary petrochemicals believed to be associated with the production of hazardous substances. The tax is collected from a relatively small number of taxpayers.
- Feedstock Tax II (Modified Rates and Substances) is a feedstock tax that is levied on a somewhat different set of substances than are taxed under the current CERCLA tax. Taxable substances were selected by examining EPA data to determine which substances have been found

at sites likely to evoke Fund spending. A list of 48 substances were identified for taxation. The tax rates for these substances were calculated to reflect the frequency with which each substance was found at sites. Tax rates were set to reach a revenue target of \$5 billion over five years.

- Waste-End Tax (Non-Incentive) is a tax on the generation of all hazardous wastes regulated under the Resource Conservation and Recovery Act (RCRA). Set at a flat rate of \$4.73 per ton, this tax is not designed to create strong incentives to reduce waste generation or to alter waste management practices. While waste generation creates a tax liability, the tax would not be collected until the waste is treated, stored, or disposed in order to minimize the number of taxpayers.
- Combination Tax I (Feedstock Tax and Non-Incentive Waste-end Tax) combines elements of both a feedstock tax and a waste-end tax. The feedstock tax component, designed to raise \$500 million per year, is identical to the Feedstock Tax II described above, except that the rates have been reduced by one-half. The waste-end tax component, also intended to produce \$500 million annually, is based on the waste-end tax described above but has a tax rate of \$2.37 per ton. The rationale for combining two taxes is the ability of the resulting tax system to simultaneously achieve the strengths and benefits of each individual component. There may, however, be synergistic effects which are not experienced when using either tax by itself.
- Combination Tax II (Feedstock Tax and Incentive Waste-End Tax) is similar to the tax described above, but raises \$800 million per year from the feedstock tax component and \$200 million per year from the waste-end tax component. There are also significant differences in the structure of the waste-end tax component. The waste-end tax component is to be implemented in two phases. The first phase taxes RCRA-designated hazardous wastes that are land disposed or stored in surface impoundments or waste piles. The second phase, intended to create strong incentives for reduced environmental risk, uses a complex set of tax rates that depend on a number of environmental factors and which rise over time.

Each tax option is analyzed in terms of:

- Economic Impacts. These impacts include price and quantity changes for the taxed substances as well as macroeconomic effects.
- Equity Implications. Equity is considered in terms of both retrospective and prospective equity. The former measures the degree to which a CERCLA tax is levied on those industries and substances responsible for existing Superfund sites while the latter implies that the tax burden faced by a particular firm ought to reflect the likelihood that its activities will provoke Fund spending.

- ° Economic Incentives. The types of incentives analyzed include incentives created by a CERCLA tax to reduce generated quantities of hazardous wastes, to produce a less hazardous mix of wastes, to encourage better waste management practices, or to engage in environmentally unsound practices such as tax evasion and illicit disposal.
- ° Revenue Generating Capacity. For each tax, revenue generation is assessed in terms of the ability of the tax to generate the requisite funds and the predictability of the revenues generated.
- ° Administrative Feasibility. The administrative burden of each tax is measured in terms of the difficulty associated with the identification of taxable parties, substances, and activities; the overall reporting and recordkeeping burden imposed by the tax; and the ability of government agencies to monitor and enforce compliance with the tax.
- ° Programmatic Effects. Alternative tax options may affect both Federal and State regulatory programs for the management of hazardous wastes. A CERCLA tax may enhance, hinder or be neutral with respect to such programs. Similarly, a CERCLA tax may have implications for State tax revenues and authority.

Each of these criteria are used to evaluate the five tax options included in the study. The study does not recommend a particular tax option because doing so would require a decision about the relative importance of each criterion. Further, there are key issues which are outside of the scope of the 301(a)(1)(G) study that clearly will prove critical during the reauthorization of CERCLA. One example is the balance of trade effect of alternative CERCLA taxes. As the 301(a)(1)(F) study notes, the U.S. trade balance in chemicals has worsened in recent years. Thus, any CERCLA tax (either feedstock or waste-end) that creates a situation where taxed U.S. chemicals compete in world markets with untaxed foreign chemicals, potentially exacerbates the erosion of the U.S. trade balance in chemicals. In the context of reauthorizing CERCLA, international trade effects would be an important consideration in the design of alternate CERCLA tax options.

The key findings of the study are as follows:

- ° Virtually any CERCLA tax designed to raise \$1 billion per year has the potential to induce changes in the prices and quantities of the taxed substances. For feedstock taxes, such changes are likely to occur in the markets for primary petrochemicals and inorganic raw materials. For a waste-end tax, these changes may include a reduction in the quantity of wastes disposed or generated, higher costs for on-site waste management and higher prices for off-site waste management. Careful tax design can ensure that the adverse consequences of these economic affects are minimized and that the changes that do occur will be consistent with overall policy goals.
- ° The effect of the various taxes on macroeconomic indicators such as employment and interest rates is expected to be negligible because

the \$1 billion annual tax is only a small fraction of the nation's gross national product (0.028 percent in 1984).

- The equity consequences of a particular CERCLA tax depend, in part, on its basic design:
  - A feedstock tax, because it is imposed early in the production process, is paid at some point in the manufacture or generation of virtually all hazardous substances.
  - A waste-end tax may not have been collected in several situations where Superfund spending is involved. The inadvertent spill of a non-waste product or the illegal disposal of a hazardous waste are two cases where the tax would not be paid despite a Fund response.
  - A firm's tax burden under a feedstock tax does not necessarily reflect the environmental risk associated with its waste management activities. The tax also does not distinguish among the uses to which a taxed substance is put, despite varying degrees of hazard. A waste-end tax that reflects environmental risk may provide a closer connection between a firm's tax burden and the likelihood of provoking Fund spending.
- Any CERCLA tax system may create economic incentives for changing the behavior of firms by modifying the relative costs of inputs to the production process and/or the costs of hazardous waste disposal. Feedstock taxes are generally not capable of creating incentives for significant changes in waste management practices. A waste-end tax, depending on its design, and the size of the tax, may create some incentive for desirable behavior such as reducing the volume of waste generated or encouraging environmentally preferred waste management methods. Also, the tax, like other environmental control costs (e.g. regulations) may increase the incentive for generators to engage in undesirable behavior such as failure to report waste activities and illegal disposal of wastes.
- All of the tax systems analyzed in the study appear capable of generating \$1 billion per year in revenues. Careful design and implementation of the tax, however, are necessary to ensure full collection of the tax. The current CERCLA tax demonstrates the revenue raising potential of a feedstock tax, although its rates are roughly one-third those necessary for a \$1 billion tax. The experience of several states indicates that, in spite of some initial difficulty in estimating revenues, the waste-end tax is also capable of generating significant amounts of revenue.
- A feedstock tax imposes only a small administrative burden on both the taxpayer and the IRS. Depending on the set of substances included in the tax base, an expanded version of the current feedstock tax is not likely to add a significant number of new taxpayers and would not require major changes in the existing tax collection mechanism. A

waste-end tax may impose an added administrative burden on taxpayers and the IRS, depending on the design and level of complexity of the tax.

301(a)(1)(B) and (D) -- HAZARDOUS SUBSTANCE RESPONSE TRUST FUND RECEIPTS, OBLIGATIONS, AND DISBURSEMENTS

Section 301(a)(1)(B) of CERCLA requires a study which presents "a summary of past receipts and disbursements from the Fund." Section 301(a)(1)(D) requires a study which provides "the record and experience of the Fund in recovering Fund disbursements from liable parties." The data compiled to fulfill the mandates under sections 301(a)(1)(B) and (D) are presented as two separate components of one study. Sections (B) and (D) were combined into one study because both require a review of related financial aspects of uses and receipts of the Fund.

"B" Study. This section presents a variety of data on Fund receipts and disbursements as required by statute as well as obligations against the Fund. Obligations were included in this study because they reflect the Agency's commitments regarding the pace and direction of the Superfund program. This section of the study, therefore, identifies the source of Fund revenues, how the revenue has been spent, as well as how EPA currently plans to spend the remaining funds.

The text of the study presents Fund receipt, obligation, and disbursement data. This data is presented in three exhibits: a balance sheet of Fund receipts, obligations, and disbursements; obligations and disbursements for various program activities (e.g. removal and remedial activities, enforcement action, and research and development); and transfer allocations of CERCLA funds to other Federal agencies participating in Superfund program activities. The executive summary only presents data relating to overall Fund receipts, obligations, and disbursements.

TRUST FUND RECEIPTS, OBLIGATIONS, AND DISBURSEMENTS  
(millions of dollars)

	FY 81	FY 82	FY 83	FY 84	Total	FY 85 Est.	Est. Total (FY 81-85)
Receipts:	\$153	\$341	\$332	\$387	\$1,212	\$397	\$1,609
Obligations:	40	181	230	466	917	651	1,568
Disbursements:	8	80	148	285	521	448	969
Unappropriated Fund Balance:	78	229	351	277	277	54	54
Unexpended Fund Balance:	\$145	\$406	\$590	\$691	\$691	\$640	\$640

"D" Study. This section addresses EPA's cost-recovery efforts, including actual funds collected, settlements reached, cases referred to the Department of Justice (DOJ) for filing, and cases in development.



The recovery of Fund disbursements is authorized by Section 107 of CERCLA. Generally, section 107 provides that past and present owners, operators, generators, and transporters of hazardous substances may be liable for the costs of removal or remedial actions undertaken at those sites and for damages to or loss of natural resources.

The primary objective of cost-recovery action is to provide reimbursement of expenditures from the Fund. A secondary objective is to encourage voluntary actions by responsible parties. Cost-recoveries include all payments or reimbursements to the Fund by responsible parties. A cost recovery, therefore, includes payments by responsible parties into the Fund to (1) finance EPA or State-lead cleanup activities before the work is undertaken, and (2) reimburse the Fund for money already expended for site cleanup activities.

EPA's cost-recovery strategy generally calls for the initiation of cost-recovery efforts as soon as cleanup activities end. Generally, this means after the completion of a removal or remedial action. In some instances, however, cost-recovery may be initiated after a discrete portion of remedial work has been completed, depending upon individual circumstances and merits of the case.

The cost-recovery program concentrated on removal actions during the initial years of the Superfund program because these actions are typically of short duration (i.e. less than six months). By contrast, remedial actions generally take several years to complete. The cost-recovery program will focus on remedial actions in the coming years as more remedial actions are completed. The following summarizes EPA's cost recovery efforts:

#### SUCCESSFUL COST RECOVERIES

	Number of Actions	Value
Cost Recovery Settlements/ Judgements	33	
Cost Recoveries Collected:		\$6,106,149
Cost Recoveries Outstanding:		535,047
Total:		<u>\$6,641,196</u>

#### COST RECOVERY EFFORTS

	Number of Actions	Est. Value
Cases Filed:	77	\$ 117,688,300
Cases Referred to DOJ:	26	13,006,300
Cases in Development:	19	7,049,200
Total:	<u>122</u>	<u>\$137,743,800</u>

301(a)(1)(E) -- STATE PARTICIPATION IN THE SUPERFUND PROGRAM

Section 301(a)(1)(E) of CERCLA requires a study which provides "the record of State participation in the system of response, liability, and compensation established by this Act." The "E" study provides descriptive and quantitative information on State participation in the Superfund program in light of State resources and EPA policies over time.

The study includes a summary of CERCLA requirements and EPA policies affecting State participation; a description of State activities in the Superfund program including those associated with long-term remedial responses, short-term cleanup responses, and enforcement action; and a description of State hazardous substance cleanup programs including a summary of State financial and other resource needs.

The analysis relies extensively on a survey conducted by the Association of State and Territorial Solid Waste Management Officials (ASTSWMO) in the Fall of 1983. The major findings or conclusions of the survey are discussed below.

CERCLA Requirements and EPA Policies Affecting State Participation. CERCLA establishes a clearly defined role for States in the Superfund program. The Act requires that States participate in any remedial cleanup actions within their boundaries, either cooperating with EPA on Federal lead projects or taking the lead on the projects themselves. States must provide at least ten percent of the costs of remedial action (if the site is publicly owned, the State must pay 50 percent), plus all operation and maintenance costs after the first year.

In addition, States must follow certain notification requirements in CERCLA, and States are authorized to submit site names for the National Priorities List (NPL). In fact, among the 100 highest priority sites on the NPL, there must be one for each State designated by the State as its highest priority.

EPA initially was responsible for almost all actions during the site discovery and investigation phase of the program. However, during the last two years, the role of States has expanded significantly in this area. States first received grants for site discovery and investigation work under the RCRA Section 3012 program. EPA has continued to follow up with assistance through cooperative agreements.

State Hazardous Substance Response Activities. Although new sites continue to be identified, it appears that the more serious and the more obvious hazardous waste sites have been identified. Therefore, the primary emphasis currently is on site investigation, and most preliminary assessment activity to identify potential problems at individual sites is conducted by the States.

A comparison of EPA's figures for total sites identified in each State with estimates provided by States in the ASTSWMO survey indicates that both EPA and State estimates are similar. EPA currently has approximately 19,000

sites listed in the Emergency and Remedial Response Information System, and the States have identified approximately 18,000 potential sites. However, on a State-by-State basis, the EPA and State estimates vary widely.

EPA has started 290 remedial investigation/feasibility studies at NPL sites, and at least 66 of these are State lead sites. As these projects move into the construction phase over the next several years, States will be required to provide their cost share for construction and will be required to take over operation and maintenance after the first year. This is likely to place a significant burden on States.

States have also undertaken some long term cleanups (i.e. cleanup actions that cost more than \$1 million) on their own. Since 1981, 25 percent of the 133 long term cleanups initiated by States have been completed. Both State funds and staff resources allocated to remedial or long term cleanup activities have expanded over the past several years. Total State projections for 1984 remedial funding levels show an increase of more than 100 percent from the 1983 funding total of \$126 million. For both years, States indicated that CERCLA funds constitute the most important source for their remedial response activities. Staff devoted to remedial activities were expected to increase by 65 percent -- from 259 person years in 1983 to 428 person years in 1984. The major source of funding for State remedial staff was expected to come from State revenues.

State remedial resources and activities have remained concentrated in a small number of States. EPA's remedial activities have been more widely distributed across States.

State enforcement action is classified as the lead activity at 136 of the 538 NPL sites, and 34 of the 248 proposed sites. There are, however, no State enforcement authorities under CERCLA. States derive their enforcement authority from a variety of State laws, which differ from State to State and are not likely to contain the comprehensive authorities in CERCLA. Because EPA does not monitor State enforcement activities, there is little data available on the status of these actions.

States have reported over 2,000 sites subject to State enforcement actions from 1981 through mid-1983. Many of these actions resulted in private party cleanup. State resources devoted to enforcement totaled \$4 million in 1983 and \$6 million in 1984. Enforcement funding and staff, however, are highly concentrated in a handful of States.

Data indicate that State sources account for the vast majority of sudden release and removal funds available to the States. The number of removals or short term cleanups conducted by both EPA and the States increased each year between fiscal years 1981-1983. The States have conducted more short term cleanups than the Federal Government, but the scope of State cleanup actions is unknown. States participate informally in Superfund removal actions.

An evaluation of the sources and amounts of State funds for hazardous substance cleanup in fiscal years 1983-1985 indicates that in 33 jurisdictions, \$293 million was budgeted over this three year period. Amounts may vary widely from jurisdiction to jurisdiction; however, those that reported the

greatest expenditures and projected expenditures tend to contain numerous National Priorities List sites. Data also show that approximately 66 percent of the State's funds are available for cost-sharing.

With respect to legal and institutional constraints that have affected State's capabilities to respond to hazardous substance releases, the data support the need for States to obtain additional funding for personnel and equipment. To achieve optimal staff levels, States' FY 1983 staff would need to increase by 84 percent. In addition to the need for more funds, administrative and institutional changes could benefit State programs. Hiring freezes and salary limitations for technical personnel in conjunction with procurement restrictions have impeded the progress of many State cleanup programs.

301(a)(1)(H/I) -- ANALYSIS OF SUBSTANCES EXEMPTED FROM THE CERCLA TAX:  
COPPER, LEAD, ZINC OXIDE, FERTILIZER FEEDSTOCKS, COAL-DERIVED SUBSTANCES,  
AND RECYCLED METALS

Sections 301(a)(1)(H) and (I) require a study which examines the impact of "an exemption from, or an increase in, the substances or amount of taxes imposed by section 4661 of the Internal Revenue Code of 1954 for copper, lead, and zinc oxide, and for fertilizer feedstocks when used in the manufacture and production of fertilizers, based upon the expenditure experience of Response Trust Fund" and "the economic impact of taxing coal-derived substances and recycled metals." Together, the "H" and "I" studies require analyses of various issues surrounding potential CERCLA taxation of: (1) copper, lead, zinc oxide, and recycled metals, (2) fertilizer feedstocks and associated substances, and (3) coal-derived substances.

Copper, Lead, Zinc Oxide, and Recycled Metals. Copper, lead, and zinc oxide are not subject to taxation under CERCLA. Recycled metals are not expressly exempt from the tax. However, since the three metals which are most often recycled -- copper, lead, and zinc -- are not subject to taxation, the need for this specific exemption was essentially moot when Congress enacted CERCLA. The "H" and "I" studies examine two issues. First, whether copper, lead, and zinc oxide should continue to be exempt from taxation. This issue is addressed by reviewing: (1) EPA's experience in using CERCLA funds to address sites containing those substances; and (2) whether there would be a significant economic impact resulting from the taxation of those substances and recycled metals.

- ° Expenditure Experience Related to Copper, Lead, Zinc Oxide, and Associated Substances: The NPL is a reasonable proxy for the expenditure experience of the Fund because Fund monies have already been spent characterizing the NPL sites; some Fund resources have been spent carrying out or approving remedial or removal actions at NPL sites; and these sites represent the universe of remedial and removal actions likely to be undertaken. Generally, evidence indicates that copper, lead, zinc, and associated substances are found at a number of NPL sites, and that Fund expenditures will be attributable to releases of these substances.

- ° Copper, lead, and zinc are among the most frequently detected substances at NPL sites. Copper, lead, zinc, and related compounds have been detected at 9%, 30%, and 14% of the 538 updated NPL sites, respectively. Lead is the second most frequently occurring hazardous substance at NPL sites.
- ° Based upon a sample of 73 NPL sites where laboratory tests have been performed, copper, lead, and zinc each exceed detectable limits in the vast majority of water and soil samples taken.
- ° Economic Impact of Taxing Copper, Lead, Zinc Oxide, and Recycled Metals: A partial equilibrium economic model was developed for estimating the impact of taxing copper, lead, zinc oxide, and recycled metals under CERCLA. The model estimates the effects of alternative CERCLA tax rates on the quantity of U.S. primary production, the quantity of U.S. recycled production, the quantity of U.S. imports, and the market price. Two types of CERCLA taxes can be examined by the model: a tax on U.S. primary production, U.S. recycled production, and U.S. imports; and exempting from taxation U.S. recycled production while taxing other sources.
  - ° A tax on copper, lead, and zinc oxide comparable to current CERCLA tax rates (\$4.91 per metric ton for copper and lead and \$3.93 per metric ton for zinc oxide) would result in a minimal long-run decrease in annual consumption and only a slight price increase (under base case assumptions).
    - Copper: Annual decrease in consumption of one-tenth of one percent and price increase of 0.2 percent, or \$3.50 per metric ton.
    - Lead: Annual decrease in consumption of one-tenth of one percent and price increase of 0.6 percent, or \$3.14 per metric ton.
    - Zinc Oxide: Annual decrease in consumption of one-half of one percent and price increase of 0.4 percent, or \$3.84 per metric ton.
  - ° A tax comparable to current CERCLA tax rates would have little significance for recycled copper, lead, or zinc supply.

Fertilizer Feedstocks. CERCLA exempts the following feedstocks from taxation when used in the production of fertilizers: ammonia, methane used to make ammonia, sulfuric acid, and nitric acid.

- ° Expenditure Experience Related to Fertilizer Feedstocks: Expenditure experience of the Fund with respect to fertilizer-related materials can be defined as expenditures pertaining to actual or potential removal or remedial actions. Since fertilizer-related releases are most likely to be spills which occur during distribution, removal rather than remedial responses are more relevant.

There is little evidence that Fund resources have been or may be used to respond to fertilizer-related chemicals. Of approximately 210 removals that occurred between December 1980 and September 1983, only one is likely to be fertilizer-related. Similarly, analysis of remedial action data indicate no information which clearly suggests fertilizer-related Fund expenditure experience.

- ° Economic Impact of Taxing Fertilizer Feedstocks: The impact of taxing fertilizer feedstocks at current CERCLA levels is unlikely to significantly affect farmers. The demand for fertilizers is relatively insensitive to price changes. This means the tax could probably be passed on to farmers. The tax at current levels constitutes less than one percent of ammonia prices, and less than 0.5 percent of sulfuric acid and nitric acid prices. Fertilizers constitute approximately seven percent of farm input costs. Even if the tax were fully passed on to farmers, the tax would constitute no more than a 0.07 percent cost increase. This increase is minor when contrasted with other factors affecting agriculture such as interest rates, foreign trade policy, and weather patterns. Similarly, the effect on fertilizer markets would also be small.

Coal-Derived Substances. Coal-derived substances are currently exempt from taxation under CERCLA. At present, a tax on coal-derived feedstocks would affect two industries -- the metallurgical coke industry and the synthetic fuels industry. *Feedstocks produced from coke oven by-products include benzene, toluene, xylene, naphthalene, and ammonia.* For the coal-based synthetic fuel industry, only limited amounts of ammonia production would be subject to the tax.

Taxing coal-derived substances using the existing list of feedstocks and tax rates established under CERCLA would generate approximately \$2 million to \$4 million annually. Over ninety percent would be derived from coke oven by-products. The elimination of the current exemption would probably have a minor effect on the quantity of coal-derived substances produced because the tax would not affect the amount of crude by-products recovered in the coke-making process, and the price that producers receive for their coal-derived substances is often determined by petroleum-derived substances. The inability of producers of coal-derived substances to pass on the tax in the form of higher prices would result in an additional operating cost that would generally have to be absorbed by the U.S. steel industry. The level of the current tax is not, however, likely to be large enough to significantly affect the comparative economics of steel production.

Only limited amounts of ammonia production used for coal-based synthetic fuel projects would be subject to the tax. Tax revenues from three projects would be less than \$400,000 annually. These costs would be absorbed by the projects as the price of ammonia is based on more efficient production methods for ammonia. Since these projects would likely be subsidized, the level of subsidy would need to be increased or a lower return would have to be expected.