

December 2005

# Empty Pockets



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**Facing Hurricane  
Katrina's Cleanup with  
a Bankrupt Superfund**

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 **U.S. PIRG  
Education Fund**

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with a Bankrupt Superfund**



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Education Fund**

**December 2005**

# ACKNOWLEDGEMENTS

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Cover photos, from top to bottom: barrels of anti-freeze and synthetic oil scattered over lawns and roadways in Venice, LA as a result of Hurricane Katrina (Robert Kaufmann/FEMA); oil spill caused by Hurricane Katrina covering the streets of Chalmette, LA (Bob McMillan/FEMA); damaged tanks and materials used to collect oil spilled from refineries in Venice, LA (Robert Kaufmann/FEMA); massive oil spill in St. Bernard Parish that resulted when an oil tank was forced from its foundation by Hurricane Katrina's massive storm surge (Bob McMillan/FEMA).

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## EXECUTIVE SUMMARY

Since 1980, the Superfund toxic waste cleanup program has worked to protect the one in four Americans, including more than 10 million children, who live within four miles of the nation's most polluted toxic waste sites. After 25 years of experience, the Superfund program has evolved to protect Americans from toxic chemicals released when industry collides with nature, such as hurricanes and floods. The U.S. Environmental Protection Agency (EPA) now must use this experience to face its biggest challenge yet—cleaning up the toxic pollution left behind after Hurricane Katrina flooded the Gulf Coast. Unfortunately, funding shortfalls plague the Superfund program and may hinder its ability to respond to Hurricane Katrina and address the thousands of other polluted sites littered across the country.

In the 1970s, parents in Love Canal, New York, a community built upon a toxic waste dump, galvanized the nation when they demanded action from their elected officials to address the health problems afflicting local children. In response, Congress created the Superfund program in 1980 as the preeminent cleanup program for the nation's most contaminated and toxic sites. Since its inception, the Superfund program has performed more than 7,000 emergency removal actions and permanently cleaned up 294 sites on the National Priorities List of the most toxic sites.

Over the years, the Superfund program has evolved beyond just conducting cleanups at traditional hazardous waste sites; the Superfund program now supports response actions triggered by terrorism, natural disasters and other catastrophes. The Superfund program helped respond to the terrorist attacks on the World Trade Center, the anthrax contamination in the U.S. Senate, the devastating Midwest floods in 1993, and the initial federal response to Hurricane Katrina in 2005. In addition, the Superfund program has functioned as a safety net in hundreds of lesser-known situations when hazardous substances threatened communities after nature and industry collided. For example:

- The Gurley Pit Superfund site is situated in the floodplain of 15 Mile Bayou in northeast Arkansas. When 15 Mile Bayou flooded in 1980, water surged into Gurley Pit, releasing 500,000 gallons of hazardous waste onto residences and farmland. The Superfund program cleaned up the site and ensured that heavy rainfalls and flooding will no longer present a threat to local residents.
- In 1999, Hurricane Floyd dumped seven inches of rain over a 24-hour period in southeastern Pennsylvania. The resulting floodwaters carried toxic contaminants from an upstream industrial area into a residential neighborhood. Using the Superfund program, EPA identified two old

landfills that were leaching a toxic brew into adjacent waterways. In 2001, EPA began planning long-term cleanup actions at these two sources to protect downstream residents.

- In 1997, a severe flood at Milo Creek washed toxic mining waste from the Bunker Hill Mine and Metallurgical Complex in northern Idaho onto 50 homes. The Superfund program removed the toxic waste from the homes and is stabilizing the Milo Creek channel to prevent future floods from dumping more toxic mining waste on downstream residents.

Hurricane Katrina presents EPA and the Superfund program with its biggest challenge yet – cleaning up after a flood of epic proportions. Hurricane forces and floodwaters that hit the heavily industrialized Gulf Coast in August 2005 created a stew of chemicals, sewage, oil, and pesticides that dispersed and settled widely. In the days and weeks after the hurricane, the Superfund program helped officials sample water for toxic chemicals, contain oil spills, remove barrels containing hazardous substances, and collect and dispose of hazardous waste. The full extent of these toxic releases will take years to understand and even longer to clean, but Superfund will continue to play a pivotal role in making the area safe again for local residents.

Unfortunately, the Superfund program must confront the challenge of cleaning up after Hurricane Katrina—and addressing thousands of other still-

contaminated sites across the country—with inadequate funding. The “polluter pays” fees levied on industries and chemicals that contribute to Superfund sites expired in 1995, leaving the program without a dedicated source of funding. Consequently, financial reserves in the Superfund trust have declined from a surplus of \$3.8 billion in 1996 to levels that approach or reach zero at the end of each fiscal year, forcing average American taxpayers to shoulder more of the cost for toxic waste cleanups. In addition, Superfund’s financial demands have outstripped federal appropriations, leading to program funding shortfalls that slow or stop site cleanups and hinder EPA’s ability to address the backlog of contaminated sites.

As a result, the eve of Superfund’s 25<sup>th</sup> anniversary comes at a time when the program faces an uncertain future. To ensure that polluters, rather than regular taxpayers, pay to clean up Superfund sites, the polluter pays fees must be reinstated. Reinstating these fees will once again ensure that the Superfund program receives the funding it needs to function properly. In addition, a fully-funded Superfund program will be able to meet and overcome future emergencies and program challenges. In an era of federal budget deficits and program spending cuts amounting to billions of dollars, providing a reliable source of funding for the Superfund program with the polluter pays fees is sound public policy that will do much to protect public health and the environment.

# INTRODUCTION TO THE SUPERFUND PROGRAM

In 1980, against the backdrop of the environmental disaster at Love Canal, New York, Congress passed the Comprehensive Environmental Response Cleanup and Liability Act (CERCLA).<sup>1</sup> CERCLA established the nation's premier and most recognizable toxic waste cleanup program, the Superfund. As enacted, the Superfund program provides the federal Environmental Protection Agency (EPA) with resources and broad authority to respond to releases of hazardous substances anywhere in the United States.<sup>2</sup> With this authority, EPA and state and tribal governments respond to life threatening situations such as chemical spills, industrial fires, biological threats, dumped toxic wastes and other uncontrolled toxic releases.

The intent of the Superfund program was simple yet profound: to mitigate and eliminate the threat of toxic substances to protect public health and welfare.<sup>3</sup> Since its inception, the Superfund program has successfully controlled releases of dangerous substances in every state and U.S. territory, protecting thousands of communities and the health of millions. The program has cleaned up toxic contamination at century-old sites and responded to new toxic releases caused by negligence or forces of nature. After 25 years of existence, Superfund has solidified its position as the safety-net protecting public health and the

environment from uncontrolled toxic releases.

Although the past accomplishments of the Superfund program are impressive, significant challenges remain. Cleanups at many complex sites are ongoing, costing millions of dollars and taking decades to complete. New sites continue to be discovered, and a backlog of contaminated sites waits to be addressed. Cleanup of the toxic contamination and environmental damage that is the legacy of Hurricane Katrina will likely take years to complete at currently incalculable costs. Unfortunately, due to recurring financial problems, the Superfund program may be unable to meet these future challenges.

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## SUPERFUND'S HISTORY

Congress enacted the Superfund program to fill a major gap in environmental protections. Prior federal legislation had removed dangerous substances from our air and water and regulated the disposal of solid and hazardous wastes.<sup>4</sup> The Superfund law built upon these legislative programs by establishing a framework for the cleanup of land, surface waters and groundwater contaminated with hazardous substances.

## **Love Canal and America's Toxic Awakening**

Few events have had as much impact on national environmental policy as Love Canal, which introduced the burgeoning problem of toxic contamination into public consciousness. The events at Love Canal provided the impetus for the creation of the federal Superfund program and serve as an example of the uncontrolled toxic contamination that the program was originally designed to confront.

From 1942 to 1952, Hooker Chemical Company dumped approximately 21,000 tons of chemical waste into an abandoned canal near Niagara Falls, New York. At the time, no federal or state laws prohibited such dumping practices. In 1953, Hooker Chemical closed the site, topped the chemical waste with a thin layer of dirt, and sold the contaminated land to the local school board. Shortly after the transfer, a school was constructed atop the former chemical waste dump, and the remaining land was sold for residential development.

As early as 1958, school children began reporting burns and skin irritation. Dead vegetation and strong chemical odors were frequent, but treated as isolated anomalies. These supposed anomalies persisted for more than a decade. By the late 1970s, increased environmental consciousness prompted local residents to question the recurring problems and illnesses plaguing the area. Surveys of area residents showed increased incidents of cancer,

chromosomal damage, spontaneous abortions and other serious health ailments.

Residents of Love Canal, led by local mother Lois Gibbs, soon learned the toxic truth about their community and began to demand relocation. Constant press and media coverage turned Love Canal into a household name and compelled state and federal officials to take action. More than 900 Love Canal families were relocated. At the federal level, Congress passed CERCLA and created the federal Superfund cleanup and response program.<sup>5</sup>

### **A Fund So Super It Can Relocate an Entire Town**

Although the Love Canal story galvanized congressional action, the site was only one of thousands of contaminated sites that existed nationwide. As EPA began to systematically catalogue potential Superfund sites for investigation, the toxic story of Love Canal found new a voice in communities across the country. The City of Times Beach, Missouri was one of the first communities saved by the newly enacted Superfund program.

Times Beach, Missouri covers eight square miles along the floodplain of the Meramec River. In 1972 and 1973, the City contracted with a company to spray waste oil on unpaved roads for dust control. It was later learned that the waste oil used as a dust suppressant contained high concentrations of dioxin. Dioxin compounds are extremely stable,



persisting in the environment for decades, and are known to be carcinogenic and to cause skin diseases, hormonal damage, reproductive impacts and birth defects.<sup>6</sup>

In 1982, ten years after the dust control operations, EPA soil samples revealed dangerous levels of dioxin contamination. In response, the Centers for Disease Control and Prevention (CDC) issued a health advisory recommending that all residents immediately evacuate Times Beach. In 1983, exercising its new authority under the Superfund law, EPA again sampled areas of the town and allocated \$500,000 of Superfund money to the CDC to conduct health assessments of local residents.

Ultimately, based on sampling data and health assessments, EPA conclusively determined that Times Beach was no longer safe for human habitation. On February 23, 1983, EPA pledged \$33 million from the Superfund trust to purchase Times Beach properties and to relocate residents from the contaminated town. After completing the emergency relocation, EPA developed a long-term remedial plan to remove approximately 265,000 tons of dioxin-contaminated material in order to prevent the further spread of dioxin from flooding and other natural processes. The Superfund-financed relocation of an entire town demonstrated the power of the new program and its ability to safeguard citizens from toxic contamination.

# HOW SUPERFUND PROTECTS PUBLIC HEALTH

The Superfund program was created to respond to uncontrolled releases of toxic contamination that present unacceptable risks to human health and the environment.<sup>7</sup> To accomplish this mission, the Superfund program depends on two separate but complementary response actions: remedial cleanups and removals. The roles and responsibilities of these two response actions are set forth in the National Contingency Plan (NCP), EPA's blueprint for addressing releases of oil, toxic pollutants and other hazardous substances.<sup>8</sup>

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## SUPERFUND REMEDIAL CLEANUPS: A PERMANENT REMEDY

The purpose of a Superfund remedial cleanup is to provide a long-term and permanent remedy for released hazardous substances.<sup>9</sup> Remedial cleanups involve actions such as excavating contaminated soils, treating contaminated groundwater and destroying and removing contaminated structures. These actions are intended to offer long-term health protections by permanently eliminating toxic contaminants. If it is not feasible to completely purge toxics from a site, remedial cleanups seek to permanently sequester the contaminants to prevent human exposure. These efforts often take years to complete and can cost millions of dollars.

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## SUPERFUND REMOVALS: REDUCING IMMEDIATE THREATS

Unlike remedial cleanups that seek a permanent remedy, removal actions provide short-term responses to address immediate threats. Removal actions typically respond to time-critical or emergency situations where hazardous substances present an imminent threat to human health and the environment.<sup>10</sup> Examples of removal actions include restricting access to contaminated areas, providing alternate drinking water, removing hot spots of contamination, stopping hazardous leaks or spills and responding to chemical fires or explosions. The purpose of such removal actions is to provide a quick response to stabilize toxic sites by preventing the further spread of contamination and establishing a barrier to minimize the risk of human exposure.<sup>11</sup>

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## PROVIDING COMPREHENSIVE PROTECTIONS

Both removal actions and remedial cleanups play important roles at the majority of Superfund sites. When uncontrolled contamination is discovered at a site, EPA can first initiate a removal action to control and limit imminent threats. While completing the removal action, the agency also can begin a long-term remedial cleanup that will permanently

address site contamination. In this respect, both removal and remedial actions play a critical role at the majority of Superfund sites.

The Superfund law limits both removal actions and remedial cleanups. In order for EPA to conduct a remedial cleanup, the agency must first place the site on the National Priorities List (NPL), a list of the nation's most toxic sites. In deciding whether to place a site on the NPL, EPA applies a rigorous set of criteria to measure site contamination and identify public health risks.<sup>12</sup> Placement on the NPL reflects a determination that a site poses a sufficient risk to warrant a full-blown federal response.<sup>13</sup> Once a site is placed on the NPL, EPA can access Superfund financial resources to conduct expensive long-term cleanup activities. The prerequisite of an NPL listing helps to assure that limited Superfund money is spent only at the worst toxic sites.

To facilitate quick response capabilities, Congress exempted removal actions from the NPL listing process.<sup>14</sup> This exemption enables EPA to immediately access Superfund financial resources in order to implement time-critical removal actions. To prevent EPA from sidestepping the NPL process for larger remedial cleanups, Congress limited the scope of removal actions to a period of

one year and a cap of \$2 million of Superfund money. These limitations can only be exceeded in exigent circumstances when ongoing work is necessary to eliminate an enduring public health threat.<sup>15</sup>

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## SUPERFUND'S ACCOMPLISHMENTS AND WORK AHEAD

Since its inception in 1980, the Superfund program has performed more than 7,000 removals and placed 1,375 sites on the NPL for remedial cleanups.<sup>16</sup> Over the last 25 years, the program has had measured success, cleaning and removing 294 former NPL sites.<sup>17</sup> While these accomplishments are impressive, much work and significant challenges remain. Currently, the NPL contains 1,081 active Superfund sites, with an additional 52 sites proposed for listing.<sup>18</sup>

The Government Accountability Office, however, estimates that 150,000 to 500,000 contaminated sites still exist nationwide.<sup>19</sup> Although not all of these sites will end up on the NPL, EPA must still determine the sites that need to be addressed by the Superfund program and those that can be cleaned under state or other federal cleanup programs.

## THE POLLUTER PAYS PRINCIPLE

When Congress established the Superfund, it designed a funding structure that placed the financial burden of cleaning up toxic contamination on the polluters most closely associated with creating the contamination. This funding concept, referred to as the “polluter pays” principle, offered an equitable resolution to the contentious question of who should pay to clean up the thousands of toxic sites littered across the nation. See Appendix A for a more detailed discussion of the polluter pays principle.

The Superfund program implements the polluter pays principle in two ways. First, it requires the parties responsible for a contaminated site to pay the costs of cleaning up the site. Second, the Superfund legislation established the “Superfund trust,” a dedicated source of money from excise taxes levied on polluting industries. The Superfund trust finances response actions when the first option of compelling responsible parties to pay cleanup costs is not available. Consequently, the Superfund trust acts as a safety net that provides funding of last resort for response actions when no other party is available to pay.

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### COMPELLING RESPONSIBLE PARTIES TO PAY FOR CLEANUPS

The Superfund program authorizes EPA to impose cleanup cost liability on the polluters directly responsible for causing the contamination. If these responsible parties refuse to pay, EPA is authorized to bring a judicial action to compel payment.<sup>20</sup> EPA policy requires that the agency first try to enforce cleanup costs on responsible parties before accessing money from the Superfund trust.<sup>21</sup> Notwithstanding this policy, compelling responsible parties to pay is time-consuming, generates costly litigation, and in some cases is impossible.

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### THE SUPERFUND TRUST SAFETY NET

At many toxic waste sites, responsible parties no longer exist, cannot be located, refuse to participate, are bankrupt or otherwise do not have the financial resources to pay for the Superfund cleanup. Sites where no responsible party is available to pay for cleanup costs are commonly referred to as “orphan sites.” Orphan sites account for nearly one-third of all Superfund sites and are the largest financial drain on the Superfund trust.<sup>22</sup>

To finance orphan site cleanups, Congress established the Superfund trust, funded by fees on petroleum, chemicals and the corporations that

benefit from the use, production and disposal of hazardous substances.<sup>23</sup> These fees, commonly referred to as the “polluter pays fees,” placed the financial burden of cleaning up orphan sites on the industries most closely associated with creating Superfund sites. The polluter pays fees implemented a policy that required polluters, not taxpayers, to pay for Superfund cleanups.

In 1995, the polluter pays fees expired and have not been reauthorized to date. According to EPA site managers, limited Superfund financial resources have “artificially constrained” attempts to address the backlog of contaminated sites.<sup>24</sup> Adding to demands on limited resources is Superfund’s expanded role in disaster response operations, discussed in the next section.

## SUPERFUND'S EXPANDED ROLE: A SAFETY NET IN TIMES OF DISASTER

The Superfund program operates as a safety net to protect public health and the environment from toxic contamination. The program provides EPA with the authority and financial resources to respond to toxic emergencies and long-term cleanups. Over the years, the Superfund program has developed fully functional capabilities to respond to a wide range of incidents involving the release of hazardous substances. With these emergent capabilities and 25 years of experience, the Superfund program has evolved to assume greater responsibilities.

In addition to conducting cleanups at traditional hazardous waste sites, the Superfund program supports response actions triggered by terrorism, natural disasters and other catastrophes. The Superfund program helped respond to the terrorist attacks on the World Trade Center, the anthrax contamination in the U. S. Senate, the devastating Midwest floods in 1993, and the federal response to Hurricanes Katrina and Rita in 2005. In addition to these widely recognized calamities, the Superfund program has functioned as a safety net in hundreds of lesser-known situations when hazardous substances threatened communities after nature and industry collided.

### **Superfund Program Expands to Respond to Bioterrorism**

In October 2001, a letter sent to Senator Tom Daschle (SD) tested positive for anthrax, a deadly bacterial toxin traditionally used as a biological weapon. In response to this act of bioterrorism, the Superfund program quarantined large portions of federal office buildings on Capitol Hill and conducted sampling and emergency cleanup activities. In total, the program sampled 26 buildings for anthrax contamination and decontaminated trillions of anthrax spores from seven buildings using the disinfectant chlorine dioxide.<sup>25</sup> The Superfund program dedicated significant resources, including 50 full-time staff and more than \$27 million, to eliminate anthrax spores from Capitol Hill.<sup>26</sup>

Although Congress eventually reimbursed the cost of the anthrax cleanup, the Superfund trust covered the initial expenditures to guarantee the implementation of immediate protective actions. Superfund's response to the anthrax attacks demonstrates the importance of a dedicated and reliable source of funds for emergency actions.

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## THE SUPERFUND PROGRAM AND NATURAL DISASTER RESPONSE

Increasingly, natural disasters and other forces of nature are causing secondary threats by spilling or releasing toxic chemicals, oil, and other hazardous substances. Chemical plants, tank farms, laboratories, oil refineries, hazardous waste storage and disposal facilities and existing Superfund sites all have the potential to release large quantities of toxic substances when subject to flooding, tornados, hurricanes and other unpredictable forces of nature. Industry and regulators can minimize, but not eliminate, the threat of toxic releases from such disasters. The nation will always need a cleanup program to protect public health when nature and industry collide.

The Superfund program facilitates natural disaster response in two ways. First, the Superfund program provides training for thousands of first responders (fire fighters, police, emergency room nurses, etc.) so they can protect the public and themselves by detecting and identifying hazardous substances. This training is an essential element of emergency and disaster response capabilities. Second, the Superfund program provides the expertise and financial resources to conduct emergency and long-term response actions that protect the public from hazardous substances. See Appendix B for more information on how the Federal Emergency Management Agency coordinates disaster response with EPA's Superfund program.

Natural disasters and other unpredictable forces of nature can have a devastating impact on communities, the economy and the environment. Secondary toxic threats can significantly aggravate existing dangers and must be addressed expeditiously. As the following case studies illustrate, the Superfund program has developed the capabilities to respond to the toxic threats released by natural forces.

### **Superfund Responds to Catastrophic Flooding in the Midwest**

From May to September of 1993, record flooding devastated the Midwest states of South Dakota, Nebraska, Kansas, Iowa, Missouri, Wisconsin and Illinois. Floodwaters caused 50 deaths, destroyed more than 10,000 homes and caused \$15 billion in damages.<sup>27</sup> Floodwaters also caused releases of gas, oil, hazardous household waste and industrial waste from residential and commercial sites across the region.

In response to the 1993 floods, EPA used the Superfund program to identify and remove more than 16,000 free-floating drums and containers in the flooded regions.<sup>28</sup> The Superfund program also coordinated a hazardous waste collection program and safely disposed of thousands of pounds of hazardous materials.<sup>29</sup> To fund these critical response actions, EPA provided approximately \$34 million for environmental abatement, control and cleanup operations.<sup>30</sup>

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## CASE STUDIES: WHEN NATURE AND INDUSTRY COLLIDE

The following case studies offer examples of how the Superfund program operates to protect the public from toxic contamination released by hurricanes, floods, and other forces of nature.

### **American Creosote Works: Pensacola, Florida**

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The 18-acre American Creosote Works site, located a quarter mile north of Pensacola Bay in a predominantly residential area, is an inactive wood-treating facility that operated from 1902 to 1981 before the company filed for bankruptcy.<sup>31</sup> More than eight decades of operations left the wood-treatment site heavily contaminated with chemical preservatives such as creosote, pentachlorophenol (PCP), and other highly toxic compounds, including the carcinogen dioxin. These toxic substances were regularly dumped into two unlined 80,000-gallon lagoons that routinely overflowed during hurricanes and other periods of heavy rainfall, carrying untreated toxic wastewater directly into Pensacola Bay.

In 1983, after American Creosote Works declared bankruptcy, EPA used Superfund money to prevent heavy rains from continuing to overflow the lagoons and spill toxic chemicals into Pensacola Bay. In 1985, EPA placed the American Creosote site on the NPL for permanent cleanup. The long-term cleanup plan called for constructing an on-site landfill for disposal of contaminated soil and sediment and treating contaminated groundwater.

EPA used Superfund money to design and begin these cleanup actions.

In 2003, site project managers discovered a previously unidentified hotspot of dioxin contamination along a road routinely used by residents living adjacent to the site, including families with children under the age of six.<sup>32</sup> EPA used \$15 million in Superfund trust money to initiate another emergency removal at the site.<sup>33</sup> This action included constructing a fence to prevent access to the contaminated road and excavating the contaminated soil to remove the dioxin from the road and eliminate the possibility of human exposure.

Since 1983, the Superfund trust has provided the money and resources to perform the emergency removals needed to prevent heavy rainfalls from carrying PCP, creosote and dioxin into Pensacola Bay and to eliminate the previously undiscovered dioxin threat. EPA also has used Superfund money to design and begin a permanent cleanup remedy. Despite these efforts, recent under-funding has slowed cleanup efforts at the site; according to EPA, the threat of human exposure to toxic chemicals on the site remains.<sup>34</sup>



## **Bunker Hill Mine and Metallurgic Site: Coeur d'Alene, Idaho**

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The Bunker Hill Mine and Metallurgic Site, located outside of Coeur d'Alene, Idaho, encompasses 21 square miles and is one of the largest and most polluted Superfund sites in the nation, stretching into northeastern Washington State.<sup>35</sup> Mining and lead smelting from the late 1800s to the 1970s contaminated soil, groundwater, rivers and Lake Coeur d'Alene with lead, arsenic, zinc and cadmium. High pollution levels have created dead zones in many rivers, wetlands and portions of the lake.

In 1981, mining operations ceased, and by 1983 the site was on the NPL. Due to its massive size and complexity, the cleanup plan divided the site into units and split the massive cleanup costs between the responsible parties, the state of Idaho and the Superfund trust. Superfund's share of cleanup costs increased when Gulf Resources, one of the responsible parties, filed for bankruptcy in 1993.<sup>36</sup>

Studies of residents living in the vicinity of Bunker Hill revealed that 80% of the children tested had dangerous levels of lead in their blood.<sup>37</sup> Lead exposure is a proven cause of brain damage and mental impairment in developing children.<sup>38</sup> A population of 250,000 live in the area affected or threatened by the Bunker Hill site.

Millions of pounds of lead, cadmium, arsenic and zinc continue to taint flood plains, and flooding from snowmelt and spring rains annually spreads this contamination over larger areas. In

1997, for example, severe flooding carried mine tailings down Milo Creek, contaminating more than 50 homes and five miles of regularly trafficked public roads and paths.<sup>39</sup> After the flooding, EPA used Superfund trust money to help implement a \$12 million emergency stabilization project to prevent future floodwaters from contaminating downstream homes and to clean the residential contamination caused by the 1997 floods.<sup>40</sup>

The Bunker Hill Mine continues to release an average of 1,500 gallons a minute of contaminated mine water that is so acidic it burns exposed skin.<sup>41</sup> The acidic water contains high levels of lead, arsenic, cadmium and zinc and must be immediately treated to protect public health.<sup>42</sup> EPA estimates that treatment of this water will continue for decades at an annual cost of \$2.5 million per year.<sup>43</sup> Although Idaho pledged \$400,000 per year for these efforts, the Superfund trust will likely supply the rest of the money needed to protect local residents from the dangerous water.<sup>44</sup>

Under the Superfund program, EPA has worked to protect Coeur d'Alene residents from the toxic dangers at Bunker Hill. The massive extent of toxic contamination has kept EPA and Idaho on the defensive, but the availability of Superfund trust money has enabled EPA to respond to threatening situations. In recent years, however, persistent under-funding has forced EPA to scale back long-term cleanup actions.<sup>45</sup>

## **South 8th Street Landfill: West Memphis, Arkansas**

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The 30-acre South 8<sup>th</sup> Street Landfill Superfund Site in West Memphis, Arkansas is situated on the Mississippi River floodplain and is surrounded by residential areas to the north and west.<sup>46</sup> Starting in the 1950s, the site was used as both a landfill and for the disposal of waste oil sludge from oil refining operations. These activities deposited large amounts of toxic pollutants at the site, including polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), benzene, toluene, ethylbenzene and xylene. Benzene, PCBs and PAHs are known carcinogens and can cause serious developmental and reproductive impacts.<sup>47</sup>

EPA placed the site on the NPL in 1992 and issued a proposed cleanup plan for the site in 1993. Due to its proximity to the Mississippi River, the site lies in the one-year floodplain, flooding annually between November and May. When the site was first placed on the NPL, floodwaters regularly carried toxic contaminants offsite, threatening the 30,400 people that live within four miles of the site and the ecosystem of the Mississippi River.<sup>48</sup>

To stop the migration of toxics by floodwater, EPA ordered the parties responsible for the site contamination to construct a containment berm to prevent floodwaters from inundating the site and to conduct a full investigation to determine long-term cleanup options. The responsible parties failed to comply with this order, forcing EPA to use Superfund trust money to construct the berm needed to prevent further offsite contamination.

Six years after EPA first ordered them to clean the site, the responsible parties finally became involved and completed long-term cleanup actions in 2004.<sup>49</sup> Although these guilty parties eventually accepted responsibility for their polluted site, the Superfund program provided the money and resources to prevent six years' worth of toxic flood runoff and preclude the further disposition of toxic substances on neighboring properties and in the Mississippi River.

## **Lower Darby Creek Site: Philadelphia, Pennsylvania**

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The Lower Darby Creek Superfund Site is located in the southwest section of Philadelphia.<sup>50</sup> Starting in 1950s, the Clearview and Folcroft Landfills operated adjacent to Darby Creek, disposing of municipal, commercial and hospital wastes along the edge of the

Creek. In 1973, both of these landfills were shut down after continued violations of disposal regulations and improper waste management practices.<sup>51</sup> The selected method of closing the landfills involved capping the former disposal areas with a layer of

dirt. After closing, a total of 900 homes were constructed along the eastern and southern edges of the landfills.

In 1998, EPA investigators discovered that the dirt covers on the landfills had eroded. Runoff contaminated with dioxin, PCBs, PAHs and other volatile organic compounds was seeping into nearby Darby Creek, endangering residents that consume fish from the creek and threatening the local environment. Of special concern is the 1200-acre John Heinz National Wildlife Refuge, just downstream of the site, which includes the largest remaining freshwater tidal marsh in Pennsylvania.

Heavy rainfall and flooding caused by Hurricane Floyd in 1999 drastically amplified the public health dangers posed by the leaking landfills. In a 24-hour period, seven inches of rainfall dumped on southeastern Pennsylvania,

causing significant flooding in Darby and Cobb Creeks.<sup>52</sup> These floodwaters inundated local communities and coated homes with a blue-green sludge.<sup>53</sup> According to a subsequent health survey, more than 40 families stated that their children suffered unusual illnesses since the 1999 flood.<sup>54</sup>

After Hurricane Floyd spread site pollutants to neighboring communities, EPA, acting upon years of accumulated data, listed Lower Darby Creek on the NPL.<sup>55</sup> The Folcroft Landfill is currently owned by the U.S. Fish and Wildlife Service, which will take the lead on paying for cleanup actions at that site. As for the Clearview landfill, without any available responsible parties, EPA will continue to conduct sampling, planning and cleanup actions relying on money provided by the Superfund trust.<sup>56</sup>

### **Mohawk Tannery: Nashua, New Hampshire**

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The former Mohawk Tannery facility is located on a 30-acre site in Nashua, New Hampshire.<sup>57</sup> For 60 years, site operators tanned hides for leather, producing both alkaline and acidic waste streams that were discharged in two surface lagoons. The Mohawk Tannery ceased operations in 1984 and abandoned the site without removing the toxic wastes from the surface lagoons and other areas of the property.

Over the years, the site has become an increasingly dangerous and dilapidated industrial eye sore. There are gaps and breaks in the chain link fences

surrounding the abandoned industrial property, and the New Hampshire Department of Environmental Protection has observed children riding bikes across the site between the waste lagoons and the Nashua River. No barriers surround the waste lagoons to prevent human contact with the hazardous chemicals still stored within.

Sludge in the surface lagoons contains elevated levels of arsenic, cadmium, chromium, lead, pentachlorophenol and trichloroethylene. In addition to the absence of human barriers, the waste lagoons also are situated well within the

100-year floodplain of the Nashua River and have not been maintained to prevent washout of the hazardous substances in the event of a flood.<sup>58</sup> The precarious lagoons sit well below the water table, and contaminated lagoon sludge comes into direct contact with the groundwater that supplies drinking water for more than 5,000 local residents. Two popular fishing spots, the Nashua and Merrimack Rivers, also border the facility.

In 2000, EPA first began to address the Mohawk Tannery site by removing asbestos-laden building materials and a

number of waste drums and repairing gaps in the fence to prevent children from accessing the unsafe site. Currently, EPA is conducting further sampling to determine the extent of contamination and is developing a remedial design plan to permanently clean the site. Because no solvent responsible party has been identified, the Superfund trust has funded the actions at the Mohawk site. Future protective actions to clean up the site and contaminated groundwater and to remove toxic wastes from the perilous lagoons will continue to rely on the Superfund trust.

### **Callahan Mine: Brooksville, Maine**

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The Callahan Mine Site is located 1,000 feet southeast from the Town of Brooksville, Maine.<sup>59</sup> The site, a former open-pit zinc and copper mine opened in 1887 and closed in 1972, lies adjacent to and beneath the Goose Lake tidal estuary. At the time of its operation, the mine was reputedly the only inter-tidal mine in the world. As an inter-tidal mine, the open-pit is subject to the ebb and flow of the tide that carries waste tailings into the tidal estuary. In 1972, the intentional demolition of a dam permanently flooded the mine, which remains underwater today.

In 1975, the Maine Department of Marine Resources discovered high levels of bioaccumulative lead, zinc, copper and chromium in marine organisms in Goose Lake and the adjacent Goose Cove. Levels of contamination in Goose Lake and Goose

Cove organisms are several orders of magnitude higher than anywhere else in the state and present a serious danger to people that swim in the water or eat the mussels and other shellfish collected from the tidal estuary. In 1999, the Maine Department of Environmental Protection collected additional samples and again identified high levels of toxic heavy metals including copper, zinc, lead and arsenic.

EPA and the State of Maine commenced actions in 2002 to address the contamination from Callahan Mine by placing the site on the NPL.<sup>60</sup> Currently, the Maine Department of Transportation (DOT) is the only identified solvent party with any financial responsibility at the Callahan Mine. EPA and Maine DOT entered into an agreement for the state to conduct a thorough site investigation from which

it will develop a cleanup plan.<sup>61</sup> The submerged mining site presents a serious challenge and will likely cost millions of dollars to clean. Although the State of Maine is liable for a portion of the Superfund site, the amount the

state can provide to clean the complex site remains unsettled.<sup>62</sup> If Maine is unable to absorb the full costs of cleanup, EPA may provide funding from the Superfund trust.

### **Southern Maryland Wood Treating Site: Hollywood, Maryland**

The Southern Maryland Wood Treating Site is approximately 25-acres in size and is situated one mile north of Hollywood, Maryland.<sup>63</sup> From 1965 until 1978, wood treatment operations produced liquid wastes containing creosote and pentachlorophenol (PCP). Creosote and PCP cause cancer, liver damage, skin blistering, eye burns and convulsions.<sup>64</sup> These toxic wood preserving wastes were disposed of in six unlined lagoons and have contaminated soil and groundwater.

In the early 1970s, the State of Maryland negotiated with the operators of the site to clean up existing site contamination. During negotiations, the operators declared bankruptcy and closed the facility in 1978. The State of Maryland eventually compelled the defunct company to perform preliminary cleanup actions in 1982. These actions involved spraying untreated toxic wastewater in the woods behind the lagoon and mixing untreated toxic sludge with woodchips for disposal on another area on the site. These ill-conceived cleanup actions spread toxic substances from the wastewater lagoons to previously uncontaminated areas of the site.

In 1985, EPA conducted an emergency response action prompted by the discovery of toxic substances seeping into a freshwater pond. The emergency action excavated 1,400 cubic yards of contaminated sediment for onsite treatment and disposal in a newly constructed and properly lined lagoon. During these operations, EPA discovered numerous other areas of contamination and ultimately placed the site on the NPL in 1986.

Since 1988, EPA has used Superfund trust money to clean and remove the contamination at the Southern Maryland Wood Treatment Site. In 1999, while cleanup efforts were still underway, Hurricane Floyd dumped 17 inches of rain on the site, flooding one of the still-contaminated lagoons with approximately two million gallons of rainwater.<sup>65</sup> In response to the Hurricane Floyd situation, EPA allocated greater resources to reduce the threat of overflow from the lagoon.<sup>66</sup> In total, the Superfund program removed more than 270,000 tons of creosote and PCP-soaked soils, spending \$60 million in Superfund trust money to implement long-term cleanup plans and to protect neighboring residents from exposure to the toxic chemicals at the site.<sup>67</sup>

## **Gurley Pit: Edmondson, Arkansas**

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The Gurley Pit Superfund Site is located approximately 1.2 miles north of Edmondson, Arkansas.<sup>68</sup> The site is located within the floodplain of 15 Mile Bayou, a tributary to the St. Francis River. Immediately adjacent to the site are soybean fields and residential areas. The Gurley Pit also shares a hydrological connection to three major groundwater aquifers used to irrigate the soybean fields and for residential drinking water sources.

The Pit was first created when clay deposits were excavated for use as construction material. In the 1970s, the Gurley Refining Company leased the pit for a 10-year period to dispose of toxic materials produced from the reprocessing of waste oil. Prior to the expiration of the lease, Gurley Refining Company walked away from the site, stating that it had completed disposal operations. The company had, in fact, completed disposal operations by filling the Pit with toxic waste, eliminating the need for further use of the site.

In 1978, the U.S. Fish and Wildlife Service discovered that heavy rainfalls were overflowing Gurley Pit and sending toxic contaminants into 15 Mile Bayou, seriously injuring and killing resident fish and waterfowl. This discovery was a harbinger of the damage to come. In 1980, 15 Mile Bayou flooded and

inundated the Gurley Pit, releasing 500,000 gallons of waste oil, PCBs, and toxic sediment containing heavy metals onto the neighboring farm fields and residential properties.

Shortly after the flood event, EPA began removal actions to address the toxic sediment and to prevent future flooding from releasing the contaminants still contained within the Pit. EPA also placed the site on the NPL and began to implement a long-term remedial cleanup to fully remove contamination from the Gurley Pit and the adjacent contaminated sites.

EPA initiated its response actions at the Gurley Pit with money provided by the Superfund trust but sought to impose these and future costs on two responsible parties, the landowner that leased the property for disposal purposes and the Gurley Refining Company. The Gurley Refining Company refused to pay and liquidated its assets before EPA could recover cleanup costs. The landowner possessed limited financial resources and was unable to pay for the majority of cleanup costs. As a result, the Superfund trust provided the funding to prevent future releases of toxic pollution by floodwaters and to ultimately complete cleanup and remove the site from the NPL in 2003.<sup>69</sup>

**Table 1. How the Superfund Trust Protects Public Health When Nature and Industry Collide: Summary of Site Profiles**

Site Name and State	Crisis and the Actions Taken to Protect Public Health
<b>American Creosote, Florida</b>	EPA implemented a cleanup action to prevent heavy rainfalls from carrying toxic wastewater from an industrial lagoon into Pensacola Bay. The Agency also initiated an emergency action to remove a hotspot of dioxin contamination on a road regularly used by local residents.
<b>Bunker Hill Mine and Metallurgic Site, Idaho</b>	After severe flooding carried waste contaminated with heavy metals into the local community, EPA instituted an emergency action to clean contaminated homes and to prevent future floods from threatening downstream homes. EPA also is treating the continued release of toxic wastewater from the mine site.
<b>South 8<sup>th</sup> Street Landfill, Arkansas</b>	When the responsible parties refused to participate, EPA implemented emergency action to prevent floodwaters from carrying toxic sludge into adjacent communities and the Mississippi River.
<b>Lower Darby Creek, Pennsylvania</b>	In 1999, Hurricane Floyd caused severe flooding that carried chemicals from two landfills downstream into a residential area. EPA is working to prevent the continued spread of toxic pollution and to stop the landfills from leaching toxic substances.
<b>Mohawk Tannery, New Hampshire</b>	EPA initiated actions to prevent children from accessing the site and to eliminate the possibility that floodwaters would further spread toxic chemicals. The agency also is addressing the contamination of groundwater that supplies drinking water for local residents.
<b>Callahan Mine, Maine</b>	This inter-tidal abandoned mine is the source of heavy metal contamination in the adjacent estuary. Toxic contamination poses a serious threat to residents that swim in the area or eat the contaminated shellfish. EPA and the State of Maine are working to stop the release of toxics into the estuary from the flooded mine.
<b>Southern Maryland Wood Treatment, Maryland</b>	EPA initiated a cleanup to eliminate the migration of pollutants into groundwater. After Hurricane Floyd flooded the site, EPA allocated greater resources to reduce the threat of overflow from contaminated lagoons.
<b>Gurley Pit, Arkansas</b>	Floodwaters overflowed a pit filled with waste oil, PCBs and sediments containing heavy metals, spilling this toxic slurry into adjacent farmland and residential areas. EPA initiated cleanup actions to eliminate the looming threat that future floodwaters might once again overflow the toxic pit.

# THE SUPERFUND PROGRAM IN THE WAKE OF HURRICANE KATRINA

As demonstrated by the case studies on the previous pages, natural forces can contribute to the release of toxic substances and complicate cleanups of existing hazardous waste sites. Despite the permanent reality of nature's unpredictable impacts, the Superfund program has evolved to address these situations and to offer critical public health protections against the secondary impacts of toxic contamination. EPA now must use the Superfund program's experience in handling the collision of nature and industry to respond to what may be the largest challenge yet: cleaning up after Hurricane Katrina.

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## ENVIRONMENTAL DEVASTATION FROM HURRICANE KATRINA

Hurricane Katrina affected more than a half million people located within 90,000 square miles spanning Louisiana, Mississippi, and Alabama. The devastation caused by the category 4 hurricane has resulted in the largest natural disaster relief and recovery operation in United States history.

In the aftermath of Hurricane Katrina, hazardous substances present both immediate and long-term health threats. The Gulf Coast, one of the most heavily industrialized and polluted areas in the nation, is blanketed by thousands of facilities that regularly store, produce

and release a myriad of toxic substances. Hurricane forces and floodwaters stirred up industrial and household chemicals, sewage, oil, and pesticides and deposited them across the region. The full extent of these toxic releases will take years to understand and even longer to clean. EPA Administrator Steven Johnson admitted that it is impossible to estimate how long future cleanup efforts along the Gulf Coast will last.<sup>70</sup> With the magnitude of toxic contamination, an ominous future greets returning residents who have already endured more hardships than can be imagined.

Reports on the environmental damage and public health risks created by Hurricane Katrina and flooding from the breached levies in New Orleans are widespread. Testing by EPA and independent organizations discovered dangerous levels of contaminants in floodwaters and in the sediment deposited across flooded areas. Debris from destroyed buildings and houses contain the carcinogen asbestos and are a likely source of lead and other hazardous substances once used as building materials. Oil and gasoline released from gas stations, damaged cars and boats and oil refineries spilled into surrounding communities and mixed with floodwaters to disperse over wide areas. Finally, chemical and industrial facilities, hazardous waste storage areas and Superfund sites



suffered extensive damage, and the integrity of these sites is still the subject of inspection and testing.

### **Floodwater and Sediment Toxicity**

In New Orleans, Louisiana, sampling of floodwaters and sediments by EPA and independent organizations revealed a cocktail of contamination. Samples taken by EPA showed the presence of arsenic, lead, mercury, PCBs, PAHs, chromium and benzo(a)pyrene to name a few.<sup>71</sup> Some samples revealed the presence of the carcinogen arsenic at levels 200 times greater than established health criteria.<sup>72</sup> Benzo(a)pyrene, an ingredient in creosote and a probable human carcinogen, was found in amounts 570 times greater than established health criteria.<sup>73</sup>

In addition to the contaminants found by EPA, similar tests by the Subra Company and Altamont Environmental Company found a disturbing mix of toxic pollutants including barium, lead, benzene, toluene and carbon disulfide.<sup>74</sup> Due to these results, EPA and the Centers for Disease Control and Prevention recommended that local residents and aid workers avoid all contact with the contaminated floodwaters.<sup>75</sup> Consistent with EPA's duties under the federal disaster response plan, the Superfund program is responsible for long-term hazardous substance cleanup efforts, which may include efforts to remove the toxic chemicals left by receding Katrina floodwaters.<sup>76</sup>

### **Removal and Disposal of Debris**

Debris from damaged and destroyed structures also presents a serious environmental and public health concern. Hurricane Katrina produced an astonishing 22 million tons of solid debris waste, an amount 15 times greater than the debris removed after the 2001 attacks on the World Trade Center.<sup>77</sup> After spending weeks submerged in toxic floodwaters, much of this debris is contaminated with raw sewage, oil and an assortment of hazardous chemicals. According to EPA, debris from older buildings is a likely source of asbestos and may be contaminated with other toxics such as PCBs or lead.<sup>78</sup>

To deal with the accumulated toxic debris, state officials reopened the Old Gentilly Landfill, an ancient dump that was shut down by federal regulators in the 1980s due to improper disposal practices and toxic contamination concerns.<sup>79</sup> The reopening of the unlined landfill prompted local residents to file a lawsuit over concerns that the ill-suited landfill will become a Superfund site.<sup>80</sup> These fears are not without precedent. After Hurricane Betsy flooded much of New Orleans in 1965, contaminated debris was disposed at the Agriculture Street Landfill, a site that eventually landed on the NPL for Superfund cleanup (see sidebar on page 28).<sup>81</sup> As proven by the Agriculture Street Landfill, improper debris management raises serious concerns that Hurricane Katrina disposal sites will one day require Superfund cleanup.

## **Oil Spills Rivaling the *Exxon Valdez***

Oil spills are perhaps the most easily identifiable form of toxic contamination that resulted from Hurricane Katrina. Across the Gulf Coast, the Coast Guard reported at least 133 oil spills and nine major spills of 10,000 gallons or more, including a spill at the Bass Enterprises Production Company on the Mississippi River that released 3.78 million gallons of oil.<sup>82</sup> In total, more than eight million gallons of oil was released from the identified spills.<sup>83</sup> This total does not include gasoline leaked from service stations and more than 300,000 flooded cars, which adds approximately two million gallons to the total oil spilled.<sup>84</sup>

The estimated 10 million of gallons of oil and gas spilled over vast areas of the Gulf Coast rivals the amount of oil spilled from the *Exxon Valdez*, the worst spill in our nation's history.<sup>85</sup> The 1989 *Exxon Valdez* disaster confirmed that oil spills are not easily cleaned. Fifteen years after the tragic spill in Alaska, cleanup efforts are ongoing, and deposits of oil still contaminate 58% of the areas sampled.<sup>86</sup> Attempts to deal with spilled oil along the Gulf Coast will likely follow suit, costing millions of dollars and spanning years, if not decades.

## **Superfund Sites and Industrial Facilities**

The areas affected by Hurricane Katrina are home to 24 Superfund sites, 466 industrial facilities that handle large quantities of hazardous substances, and countless other sites that store, use or

produce hazardous substances.<sup>87</sup> In Mississippi and Alabama alone, 450 chemical spills were reported and the integrity of many chemical and industrial facilities called into question.<sup>88</sup> For instance, in Mississippi, Hurricane Katrina caused extensive damage at a phosphate fertilizer manufacturing plant, rupturing a tank that leaked lethal anhydrous ammonia into the surrounding areas.<sup>89</sup>

The business entities that own or operate industrial and chemical facilities damaged by Hurricane Katrina are typically held accountable for any toxic cleanup costs. These entities may be able to escape liability, however, by claiming bankruptcy or by successfully asserting a statutory "act of God" defense.<sup>90</sup> In these latter cases, the Superfund trust will be responsible for funding cleanup actions.

Hurricane-related damage from high winds, storm surges and flooding also may have compromised the integrity of former and current Superfund sites, raising concerns that once-sequestered toxics were released into the environment. To address these concerns, the Superfund program conducted visual assessments and preliminary sampling at all 24 sites. These inspections revealed that three Superfund sites were completely inundated by floodwaters, potentially damaging established safeguards.<sup>91</sup> EPA is continuing investigations at all sites to determine the true extent of the damage.<sup>92</sup> Should it be determined that any site presents a threat to human health, the Superfund program will

once again be called upon to make these sites safe.

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## THE SUPERFUND SAFETY NET AND FUTURE CLEANUP OF THE GULF COAST

In response to Hurricane Katrina, the Superfund program initiated a wide range of disaster response actions. Superfund staff conducted sampling, assisted with debris removal, stopped the continued spread of oil, inspected Superfund and other hazardous waste sites, removed more than 5,000 barrels containing substances ranging from gas to medical waste, and implemented a program to properly dispose of approximately one million pounds of household hazardous waste.<sup>93</sup> Although the Superfund program has done much to date, Katrina cleanup efforts continue with no end currently in sight.

According to a senior EPA policy analyst, the cleanup of New Orleans and other affected Gulf Coast areas will be a daunting task that could cost billions of dollars and take years to complete.<sup>94</sup> Receding floodwaters deposited pollutants, oil and hazardous chemicals in sediment and soil, on buildings and houses and in rivers and other waterways. Although contaminated floodwaters are gone, many toxic constituents deposited by the waters remain undetected. The true environmental and public health impacts from Hurricane Katrina may take years to understand, and even longer to clean.

## Financing Future Katrina Cleanup Efforts

The Superfund program will play a critical role in the long-term cleanup of the affected Gulf Coast areas.

With the full extent of toxic contamination still unknown, absorbing future cleanup costs is a hot potato no federal agency wants to hold. According to federal disaster response policies, the Superfund program is directly responsible for the costs and implementation of long-term response and remediation efforts (see Appendix B).<sup>95</sup> Although the Disaster Relief Fund provided \$100 million to reimburse EPA for some response costs, future toxic removal and remedial cleanup costs are likely to be borne by the Superfund trust.<sup>96</sup> Consequently, as Hurricane Katrina cleanup efforts progress, toxic cleanups will present a significant financial drain on already limited Superfund resources.

Once federal disaster funds run dry, EPA holds two options to finance future and on-going toxic cleanups in the Gulf Coast. The agency can either seek to impose liability on a private party or pay for the cleanup using Superfund trust money. It is highly unlikely that EPA will be able to impose cleanup costs on polluters for two reasons. First, it will be difficult if not impossible for EPA to identify sources of toxic contamination or to prove that contamination originated from particular facilities. Second, assuming EPA can identify and prove the source of contamination, polluters can assert a

statutory defense that relieves them of the obligation to pay for cleanups that result from an “act of God.”<sup>97</sup>

EPA also will be unable to recover cleanup costs from contaminated landowners. Due to a long-standing and well-reasoned EPA Superfund policy, owners of residential property are not liable for contamination that they did not cause.<sup>98</sup> With EPA unable to place cleanup costs on landowners or polluters, the Superfund trust will assume its safety net role by paying for cleanup at these orphan sites. Considering the extent of contamination and damage caused by Hurricane Katrina, the number of orphan sites could be substantial, adding a significant financial burden to an already under-funded Superfund program.

### **Hurricane Katrina’s Financial Impact on the Superfund Program**

Orphan sites caused by natural disasters create a significant and unanticipated financial drain on already scarce Superfund trust resources. If current program funding levels remain static, the potentially large financial demands from future Katrina cleanups will add to Superfund’s fiscal woes, weakening the Superfund trust safety net and reducing the capability of the program to fund other toxic cleanups.

Given that Hurricane Katrina will increase demand for scarce money, the Superfund trust must receive increased funding in order to sustain a properly functioning program. Congress has two viable options to increase program funding: allocate more money from taxpayer revenues or reinstate the polluter pays fees. Considering the financial burden already borne by taxpayers for Superfund cleanups and Katrina aid, reinstating the polluter pays fees provides a fiscally sound and equitable resolution.

## Dante's Inferno

The 95-acre Agriculture Street Landfill,<sup>99</sup> situated in the eastern part of New Orleans between Lake Pontchartrain and the French Quarter, was covered with Hurricane Katrina floodwaters for more than three weeks.<sup>100</sup> The potential damage from these floodwaters dredged up concerns over a site that has plagued local residents for two decades.

Starting in 1909, the Agriculture Street Landfill accepted municipal and industrial waste until 1950 when it closed for a short period. In 1965, the landfill reopened to accept large amounts of debris from the cleanup of Hurricane Betsy, which included toxic incinerator ash and hazardous debris. After decades of haphazard disposal practices, the landfill became a hotspot of contamination loaded with lead, dioxin, carcinogenic hydrocarbons, and pesticides such as DDT. Constant underground fires and an unearthly stench prompted area residents to nickname the site "Dante's Inferno."<sup>101</sup>

In the 1970s, the site closed for good and was capped with a layer of dirt. The site was then sold and redeveloped for residential and public use, including the construction of a school and community center on top of the former landfill. In 1986, responding to concerns from local residents, EPA sampled the former landfill and discovered high levels of lead and polycyclic aromatic hydrocarbons (PAHs). Subsequent soil samples found dangerous levels of arsenic and benzo(a)pyrene.<sup>102</sup>

In response to the discovered contamination, EPA initiated an emergency action to remove contaminated soil, placing the site on the NPL in 1994. The long-term cleanup plan selected for the site left contaminants in place and placed another cap of clean dirt over the landfill. EPA decided not to remove the toxic chemicals after determining that the areas of the site that remained contaminated, including the groundwater, were not used for any beneficial purpose. The Superfund trust primarily funded all of the actions at this site.

Notwithstanding EPA's efforts to clean the site, toxic chemicals at the Agriculture Street Landfill still pose a serious threat to local residents. Floodwaters from Hurricane Katrina may have washed away the clean soil above the site contaminants, once again requiring EPA to dip into the Superfund trust funds to fix the problem. Sites such as the Agriculture Street Landfill underscore the importance of a fully-funded Superfund trust that EPA can use to implement permanent solutions regardless of funding concerns.

# THE SUPERFUND PROGRAM TODAY

As Superfund has matured, program responsibilities and expectations have grown. The expansion of the Superfund program to include natural disaster response support, coupled with ongoing cleanups and the identification of new sites, has dramatically increased financial demands.<sup>103</sup> Unanticipated events such as Hurricane Katrina add significantly to the financial strain on the program and threaten to tear the safety net by depleting available funds. Absent adequate funding, the Superfund program cannot fully accomplish its mission of protecting public health and the environment.

## CLEANUP SLOWDOWN

Cleaning up Superfund sites is an expensive undertaking. Even prior to Hurricane Katrina, the Superfund program suffered from a dwindling balance and experienced funding shortfalls of \$174.9 million and \$263.1 million in 2003 and 2004 respectively.<sup>104</sup> Contributing to these funding shortfalls was a 15% reduction in the amount of money appropriated to Superfund from 2000 to 2004 and the loss of income from the expired polluter pays fees (Table 2).<sup>105</sup> These cutbacks have resulted in an overall cleanup slowdown that threatens public health and increases cleanup costs as Superfund sites remain untouched and contaminants spread over larger areas and onto adjacent properties.

**Table 2. Reductions in Funding for Superfund Program Since the Polluter Pays Fees Expired in 1995 (millions of dollars)**

Year	Amount Appropriated	Change in Funding	% Change in Funding
1994	\$1,755		
1995	\$1,555	-\$200	-11%
1996	\$1,477	-\$78	-5%
1997	\$1,545	\$68	5%
1998	\$1,642	\$97	6%
1999	\$1,611	-\$31	-2%
2000	\$1,482	-\$129	-8%
2001	\$1,312	-\$170	-11%
2002	\$1,331	\$19	1%
2003	\$1,265	-\$66	-5%
2004	\$1,241	-\$24	-2%
<b>Total</b>	<b>\$14,461</b>	<b>-\$514</b>	<b>-32%</b>

Source: Government Accountability Office, Superfund Program: Updated Appropriation and Expenditure Data (2004) (Figures in constant 2003 dollars).

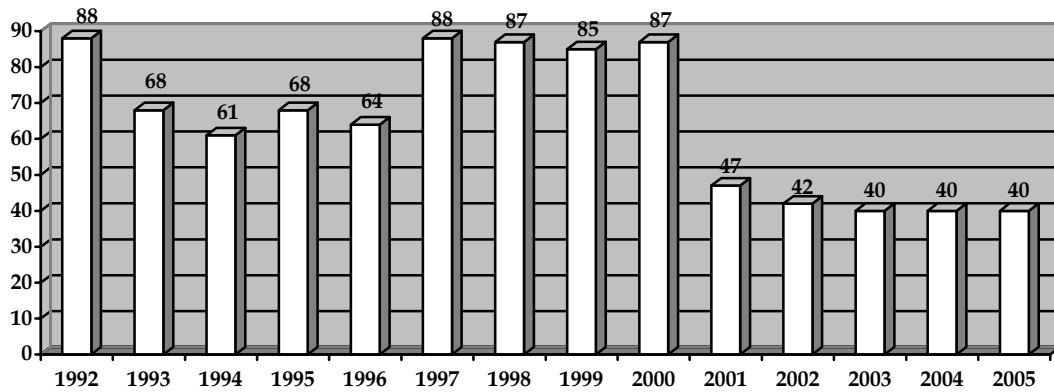
The dozens of Superfund sites receiving no funding or partial funding illustrate the current cleanup slowdown situation. Each year since 2002, the Superfund has consistently been unable to meet the financial needs for site cleanups. In 2002 and 2003, 41 Superfund sites received no funding for cleanup actions, and an additional 67 sites were only partially funded.<sup>106</sup> In 2004, 29 sites failed to receive any money for new construction activities.<sup>107</sup> (For a full list of under-funded sites by state, see Appendix C).

The diminishing number of Superfund cleanups completed each year is a further manifestation of inadequate funding. When Superfund received proper funding, the program cleaned an average of 77 sites per year from 1992 to 2000. Due to recent annual funding deficits, the number of cleanups completed has fallen to 40 sites a year (Figure A).<sup>108</sup> This represents a nearly 50% drop in the pace of cleanups and reiterates the impact that insufficient funding has on the ability of the Superfund to achieve its mission.

Deficient Superfund funding levels creates multiple problems. It undermines the purpose of the Superfund program by preventing some

cleanup activities and inhibiting the progress of cleanups that do occur. Slower and delayed cleanups increase total site costs and create a preventable and unnecessary risk for local communities. According to EPA Superfund personnel, funding uncertainty also impedes planning and design activities, making it more difficult to implement long-term cleanup strategies.<sup>109</sup> Plainly stated, without proper funding the Superfund program is unable to effectively protect communities and public health from the dangers of uncontrolled releases of hazardous substances caused by accidents, deliberate acts, natural disasters or irresponsible business practices.

**Figure A. Number of Superfund Cleanups Completed, Fiscal Years 1992-2005**



Source: Environmental Protection Agency, *Number of NPL Site Actions and Milestones by Fiscal Year*, available at <http://www.epa.gov/superfund/sites/query/queryhtm/nplfy.htm> (last accessed Nov. 30, 2005)

### **Near Disaster at the Elizabeth Mine in Stafford, Vermont**

The Elizabeth Mine in Stafford, Vermont is one of the oldest mine sites in the country.<sup>110</sup> Over the 200 years of operations at the mine, acidic waste and heavy metals including lead and copper have leached into groundwater and the Ompompanoosuc River. Despite its classification as a high-priority NPL site, the Elizabeth Mine Superfund site received no funding in fiscal years 2002 and 2003.<sup>111</sup>

The Elizabeth Mine site includes a 110-foot high pile of toxic mine waste that acts as a makeshift dam by holding back acidic liquid mining waste. In the spring of 2003, investigators discovered that portions of the waste pile were eroding and that the dam might breach at any time.<sup>112</sup> Investigators predicted that if the dam collapsed, it would send a toxic flood down the river into the communities below.<sup>113</sup> Due to this serious concern, downstream families received beepers to warn them of a dam breach.

To mitigate the immediate threat posed by the eroding dam, EPA allocated emergency funding to provide a temporary fix that stabilized the dam to prevent further erosion but left the toxic pile and liquid in striking position. The inability of the Superfund program to provide funding for the Elizabeth Mine Superfund site has placed local residents at risk and forced EPA to incur emergency costs that would not have been necessary had cleanup work begun as scheduled. Sites such as the Elizabeth Mine are indicative of the problems and risks associated with an under-funded Superfund program.

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### **A SUPER-EXPENSIVE FUTURE**

In 1999, Congress commissioned a study to predict the future financial stability of the Superfund program.<sup>114</sup> To date, the report has accurately predicted that Superfund funding shortfalls would range from \$100 million to \$300 million annually, with cumulative funding deficits eventually reaching over \$1 billion.<sup>115</sup> In 2003, the EPA Inspector General verified the findings of the report for the 2002 fiscal year, lending more credibility to the report's conclusions.<sup>116</sup>

As annual Superfund appropriations have decreased from \$1.8 billion in 1993 to \$1.2 billion in 2005, cost predictions for future years are increasing.<sup>117</sup> The recovery efforts for Hurricane Katrina are also likely to increase the financial demand on the ailing Superfund trust. Although the full extent of contamination may take years to unfold, EPA will need the Superfund trust to clean up toxic hotspots and orphan sites created by the hurricane.



## SUPERFUND'S DIM FINANCIAL FUTURE

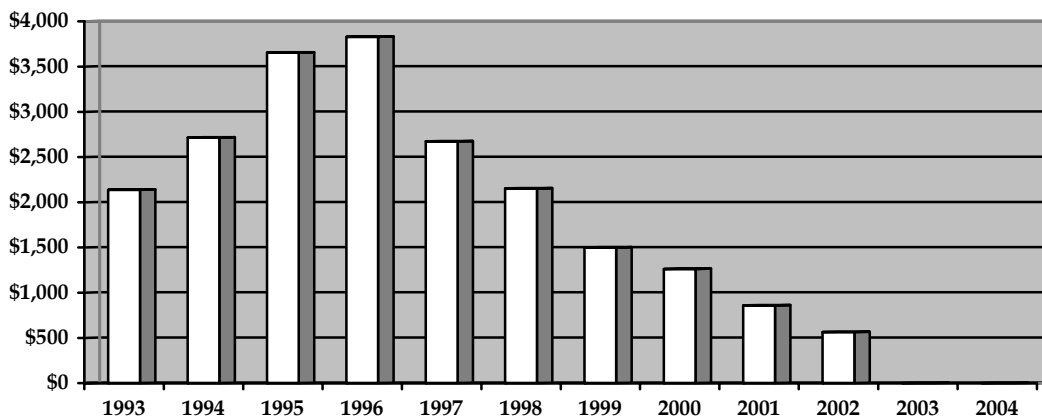
The origin of Superfund's funding shortfalls dates back to the expiration of the polluter pays fees in 1995. Prior to this date, the polluter fees provided the majority of money for the Superfund trust and ensured an adequate level of funding to accomplish program objectives. From 1991 to 1995, the polluter pays fees generated approximately \$1.4 billion annually for the Superfund trust.<sup>118</sup> This reliable source of funding grew the Superfund trust to a surplus of \$3.8 billion in 1996.<sup>119</sup> With the expiration of the fees, the financial health of the Superfund trust rapidly dwindled from a surplus of \$3.8 billion in 1996 into bankruptcy by the end of 2003 (Figure B).<sup>120</sup>

To cover the annual \$1.4 billion funding gap created by the expiration of the polluter pays fees, Congress increased appropriations from taxpayer-funded

general revenues, shifting the financial burden of cleaning toxic sites from polluters to taxpayers. Since the polluter pays fees expired, the financial burden shouldered by taxpayers has increased almost 400%.<sup>121</sup> Taxpayers now pay the entire cost of Superfund-financed cleanups (Figure C).

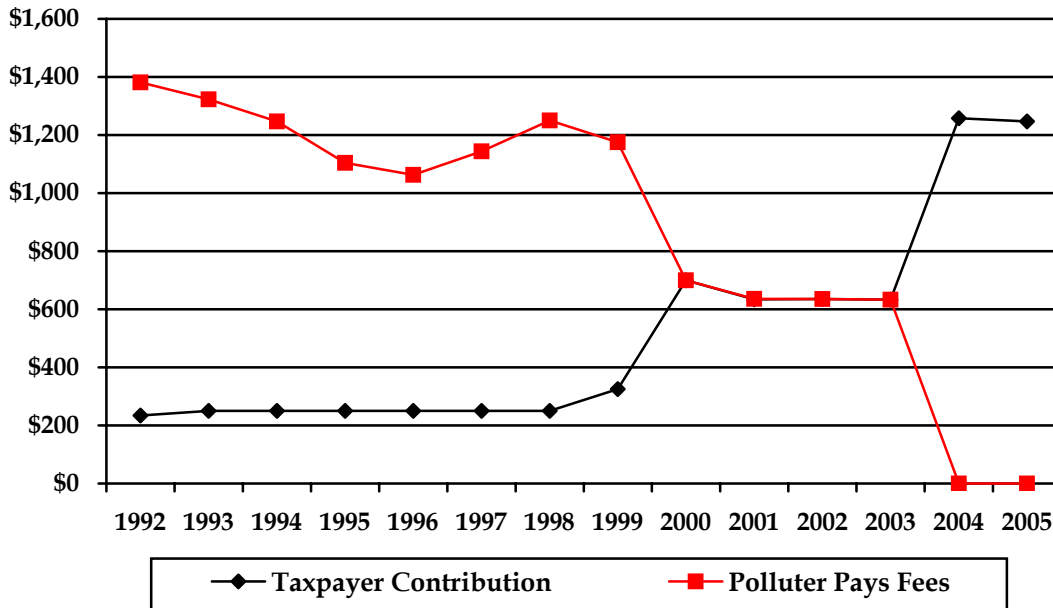
Despite the significant financial burden now borne by taxpayers to sustain the Superfund program, overall funding levels have dropped by approximately \$200 million a year.<sup>122</sup> As financial demands on the Superfund trust have steadily increased, funding for program activities has substantially decreased, leaving the Superfund program unable to perform necessary toxic cleanups. As a result, even with significant taxpayer funding to sustain the ailing Superfund trust, EPA readily admits that it "lacks adequate funds to address the growing number of sites that are ready for long term cleanups each year."<sup>123</sup>

**Figure B. Superfund Trust End-of-Year Unobligated Balance, Fiscal Years 1993-2004 (millions of dollars)**



Source: Congressional Research Service Report for Congress, *Superfund Taxes or General Revenues: Future Funding Options for the Superfund Program*, RL31410, CRS-5 (March 4, 2004)

**Figure C. Funding Sources for the Superfund Trust, Fiscal Years 1992-2005  
(millions of dollars)**



Source: Environmental Protection Agency, *Superfund Budget History*, available at <http://www.epa.gov/superfund/action/process/budgethistory.htm> (last accessed Nov. 27, 2005)

## RESTORING THE SUPERFUND

A well-funded Superfund is the cornerstone of the nation's hazardous waste cleanup program. A properly funded Superfund trust enables EPA to pay for long-term remedial cleanups at orphan sites and provides a reliable source of immediate funds to carry out removal actions intended to protect the public from immediate threats. It also confers EPA with enforcement leverage to compel responsible parties to clean contaminated sites.<sup>124</sup> Using the Superfund trust, EPA can first clean the site and then seek to recover costs from responsible parties. This reality induces responsible parties to settle with EPA or otherwise participate in the process in order to exert some influence over cleanup decisions and subsequent costs.

In order to address orphaned sites, conduct removal actions and compel responsible parties to engage in cleanup actions, the Superfund trust must receive sufficient funding. To meet Superfund's budgetary needs, federal decision makers have two options. First, policy-makers can place spending caps on the Superfund to reduce the demand on scarce program funds. This option ignores actual needs in lieu of predetermined levels of funding and will perpetuate the Superfund cleanup slowdown while escalating cleanup costs and public health risks. Second, policy-makers can restore Superfund funding to levels that enabled the program to function properly for 20 years. This option requires deriving new income from either polluter fees or taxpayer-funded general revenues.

## RECOMMENDATIONS AND CONCLUSIONS

Superfund sites threaten public health and the environment. For two decades, the Superfund program effectively provided a safety net, protecting the public from the dangers of contaminated sites. Superfund's past successes were based on vigorously forcing responsible parties to clean up their contamination and on collecting fees from polluters to fund toxic cleanups at orphan sites or where costs cannot be imposed on responsible parties. Superfund's foundation of success, however, has been eroded by the expiration of the polluter pays fees and dwindling funding for the program. As a result, the Superfund program has been weakened and is unable to effectively protect public health.

To ensure that polluters, rather than regular taxpayers, pay to clean up Superfund sites, the polluter pays fees must be reinstated. Reinstating these fees will once again ensure that the Superfund program receives the funding it needs to function properly. In addition, a fully-funded Superfund program will be able to meet and overcome future emergencies and program challenges. In an era of federal budget deficits and program spending cuts amounting to billions of dollars, providing a reliable source of adequate funding for the Superfund program with the polluter pays fees is sound public policy that will do much to protect public health and the environment.

## APPENDIX A. POLICY DISCUSSION OF THE POLLUTER PAYS PRINCIPLE

The polluter pays principle is founded on an insightful understanding of the most fair and efficient way to address Superfund financing. The principle first recognizes that the public already pays its fair share for toxic contamination in the form of health and environmental costs.<sup>125</sup> Public financing to clean the contamination caused by polluters would add to this existing burden. Next, the principle recognizes that polluting industries can internalize Superfund costs, ensuring that these expenditures are reflected as a cost of doing business.<sup>126</sup> Consequently, the polluter pays principle implements an equitable Superfund financing system that reflects a simple and widely recognized maxim: when you make a mess you should clean it up.

In addition to its equitable underpinnings, the polluter pays principle also promotes beneficial public policies by encouraging polluters to reduce the use of toxic substances and to implement improved business practices to avoid creating further toxic contamination. By taking these measures, businesses can limit their Superfund financial obligations by removing themselves from the category of polluters. Businesses that reduce or eliminate the use or release of toxic materials obtain a cost savings advantage over competitors that do not implement these protective measures. Consequently, the polluter pays principle uses market forces to drive the implementation of sound environmental business practices and the reduction of toxic substances.

## APPENDIX B. COORDINATING FEDERALLY-DECLARED DISASTER RESPONSES: FEMA AND THE SUPERFUND

Congress solidified Superfund's role in responding to federally-declared disasters with the passage of the Stafford Act.<sup>127</sup> The Stafford Act authorizes the President to declare federal emergencies after major natural disasters such as flooding, hurricanes, tornados or earthquakes. The Federal Emergency Management Agency (FEMA) administers the Act and is responsible for the management, coordination and oversight of disaster response activities. FEMA also administers the federal Disaster Relief Fund and uses this fund to finance response activities.

To achieve the goals set out in the Stafford Act, FEMA created the Federal Response Plan. This plan coordinates activities of the federal government by allocating specific functions based on areas of expertise. The Federal Response Plan classifies federal assistance into 12 areas called Emergency Support Functions (ESF) that include response functions such as health and medical services, public works and search and rescue operations. Each ESF is headed by an expert agency selected for its statutory authority, resources and capabilities.<sup>128</sup>

EPA is the primary agency for ESF #10, the Hazardous Materials Support Function. ESF #10 requires EPA to

respond to releases of hazardous substances in federally declared disasters areas. These response actions are carried out under the NCP and conducted using EPA's existing federal authority under the Superfund program.

The Stafford Act provides federal funding for disasters from the Disaster Relief Fund managed by FEMA. EPA is also authorized to access money from the Superfund trust. Since there are two sources of federal funds that can be used to respond to releases of hazardous substances in federally declared disaster areas, FEMA and EPA developed a joint guidance to resolve conflicts over payment of response costs.<sup>129</sup>

The ESF #10 guidance document sets forth the actions that EPA will fund and those funded by FEMA. Pursuant to the guidance, EPA pays for costs incurred at pre-existing Superfund, oil pollution or other hazardous sites, and for all costs associated with long-term cleanup actions and the permanent storage and removal of hazardous substances. For its part, FEMA agreed to use Disaster Relief Funds to pay for response activities including the retrieval and disposal of orphan tanks and drums, the pumping of contaminated water, household hazardous waste disposal programs and all testing and monitoring

to determine immediate health threats. Although FEMA funds certain actions involving hazardous substances, EPA and its expertly-trained response personnel perform all such activities. Table 3 summarizes the breakdown of funding responsibilities between FEMA and EPA in an emergency situation involving hazardous substances.

Under the Federal Response Plan, EPA is responsible for implementing all response actions involving hazardous substances consistent with ESF #10.

Many of these response activities are funded by the Superfund trust. Consequently, the Superfund trust serves as an important safety net in federally declared disaster areas. While responding to natural disasters is undoubtedly an important use of Superfund trust money, these response efforts can significantly drain fund resources—especially when natural disasters cause extensive and widespread contamination that requires expensive and time-consuming permanent cleanup remedies.

**Table 3. Breakdown of Funding Responsibility for Emergency Support Functions Involving Hazardous Substances.**

<p><b>Environmental Protection Agency</b></p>	<ul style="list-style-type: none"> <li>• Emergency response activities at existing Superfund sites</li> <li>• Response actions at pre-existing oil pollution cleanup sites</li> <li>• Testing of soil, air and waters for long term cleanups</li> <li>• Long term site remediation or restoration</li> <li>• Permanent storage of hazardous materials</li> </ul>
<p><b>Federal Emergency Management Agency</b></p>	<ul style="list-style-type: none"> <li>• Retrieving and disposing of orphan tanks and drums</li> <li>• Household hazardous waste program expenditures</li> <li>• Technical assistance to states</li> <li>• Pumping of contaminated water</li> <li>• Immediate assessments to determine health and safety threats</li> <li>• Control and stabilization of releases of hazardous materials posing immediate health threats</li> </ul>

# APPENDIX C. UNDER-FUNDED SUPERFUND SITES, BY STATE

Sites with Insufficient Funding in Fiscal Year 2003 (in millions of dollars)<sup>130</sup>

State	Site Name	Funding Requested	Funding Given	Underfunding by Site	Underfunding by State
<b>Connecticut</b>	Inter Royal Corporation	Unknown	0.1	1.5	<b>1.5</b>
<b>Idaho</b>	Bunker Hill Mining and Metallurgical	49.3	16.9	32.4	<b>32.4</b>
<b>Illinois</b>	Circle Smelting	8.3	1.5	6.8	<b>19.3</b>
	Jennison-Wright	12.5	0	12.5	
<b>Indiana</b>	Hog Hollow	0.2	0.1	0.1	<b>39.2</b>
	Continental Steel	39.1	0	39.1	
<b>Louisiana</b>	Kruger Battery	0.4	0	0.4	<b>9.7</b>
	Marion Pressure Treating	9.0	0	9.0	
	Pointe Coupee	0.3	0	0.3	
<b>Massachusetts</b>	Atlas Tack Company	13.1	0	13.1	<b>13.1</b>
<b>Missouri</b>	Annapolis Lead	0.4	0	0.4	<b>0.45</b>
	Union Electric	0.05	0	0.05	
<b>Montana</b>	Libby Asbestos	25.1	22.6	2.5	<b>3.8</b>
	Upper Tenmile Creek	5	3.7	1.3	
<b>Nebraska</b>	Omaha Lead	2.5	1.0	1.5	<b>1.5</b>
<b>New Hampshire</b>	Mohawk Tannery	6	0	6	<b>9.5</b>
	New Hampshire Plating	3.5	0	3.5	
<b>New Jersey</b>	Roebing Steel Co.	5.0	4.2	0.8	<b>0.8</b>
<b>New Mexico</b>	N. Railroad Ave Plume	6.5	0	6.5	<b>6.5</b>
<b>Oklahoma</b>	S&K Industries	0.4	0	0.4	<b>0.4</b>
<b>Oregon</b>	McCormick & Baxter Creosote	5.0	0.25	4.75	<b>4.75</b>

State	Site Name	Funding Requested	Funding Given	Underfunding by Site	Underfunding by State
Texas	Hart Creosoting	9.8	0	9.8	16.0
	Jasper Creosoting	6.2	0	6.2	
Vermont	Elizabeth Mine	8	0	8.0	8.0
Wisconsin	Kip Nelson Properties	1.1	0.1	1.0	1.0
<b>NATIONAL</b>				<b>167.9</b>	<b>167.9</b>

**Sites Receiving No New Construction Funding By State: Fiscal Year 2004<sup>131</sup>**

	State	Site Name
1	Arkansas	Mountain Pine Pressure Treating
2	California	Pemaco, Inc.
3	Colorado	California Gulch
4	Colorado	Central City Big Five Mine
5	Colorado	Summitville Mine
6	Delaware	Standard Chlorine, Inc.
7	Florida	Sapp Battery Salvage
8	Georgia	Escambia Brunswick Wood Treating
9	Georgia	Marzone Chemical Company
10	Illinois	Ottawa Radiation
11	Indiana	Continental Steel Corporation
12	Louisiana	Marion Pressure Treating Company
13	Massachusetts	Atlas Tack Corporation
14	Massachusetts	Hatheway & Patterson Company
15	Montana	Upper Tenmile Creek Mine
16	New Hampshire	Mohawk Tannery
17	New Hampshire	Ottati & Goss-Kingston Steel Drum
18	New Jersey	Kauffman & Minter, Inc.
19	New Jersey	Roebing Steel Company
20	Pennsylvania	Crossley Farm
21	Pennsylvania	Franklin Slag Pile
22	Pennsylvania	Havertown PCP Corporation
23	Tennessee	Wrigley Charcoal Plant
24	Texas	Hart Creosoting Company
25	Texas	Jasper Creosoting Company
26	Texas	Rockwool Industries, Inc.
27	Utah	Jacobs Smelter
28	Vermont	Elizabeth Mine
29	Washington	Bunker Hill Mining and Metallurgical



**Sites Receiving No New Construction Funding By State: Fiscal Year 2005<sup>132</sup>**

	<b>State</b>	<b>Site Name</b>
1	Colorado	Summitville Mine
2	Florida	Sapp Battery Salvage
3	Illinois	Ottawa Radiation
4	Louisiana	Marion Pressure Treating Company
5	Massachusetts	Atlas Tack Corporation
6	New Jersey	Kauffman & Minter, Inc.
7	North Carolina	Barber Orchard
8	Pennsylvania	North Penn Area 7
9	Virginia	Kim Stan Landfill

## END NOTES

<sup>1</sup> 42 U.S.C. §§ 9601 *et seq.*, Pub. L. 96-510 (Dec. 11, 1980)

<sup>2</sup> 42 U.S.C. § 9604(a) (“Whenever (A) any hazardous substance is released or there is a substantial threat of such release into the environment, or (B) there is a release or substantial threat of release into the environment of any pollutant or contaminant which may present an imminent and substantial danger to the public health or welfare, the President is authorized to act...to remove or arrange for removal of, and provide remedial action relating to such hazardous substance, pollutant or contaminant at any time”)

<sup>3</sup> *Ibid.* (The President is authorized to take any action deemed “necessary to protect public health or welfare or the environment.”)

<sup>4</sup> See Clean Air Act 42 U.S.C. § 7401 *et seq.*, Clean Water Act 33 U.S.C. § 1251 *et seq.* and Resource Conservation and Recovery Act 42 U.S.C. § 6901 *et seq.*

<sup>5</sup> Love Canal account based on the events as described in Miller and Johnston, *The Law of Hazardous Waste Disposal and Remediation*, West Publishing Co. (1996) (summarizing Martin Linsky et al., *How the Press Affects Federal Policy Making, “Shrinking the Policy Process: The Press and the 1980 Love Canal Relocation.”* (1986))

<sup>6</sup> Agency for Toxic Substance and Disease Registry, *ToxFAQs*, available at <http://www.atsdr.cdc.gov/tfacts104.html> (last accessed Nov. 30, 2005)

<sup>7</sup> 42 U.S.C. § 9604(a)

<sup>8</sup> Code of Federal Regulations Chapter 40, Subchapter J, Part 300 (40 C.F.R. §§ 300.1 – 300.920)

<sup>9</sup> 42 U.S.C. § 9601(24) (“remedial action means those actions consistent with permanent remedy taken instead of or in addition to removal actions”)

<sup>10</sup> 42 U.S.C. § 9601(22) (“removal means the cleanup or removal or released hazardous substances from the environment...to prevent, minimize or mitigate damage to public health or welfare or the environment”)

<sup>11</sup> 40 C.F.R. § 300.415(b)(1)

<sup>12</sup> 40 C.F.R. § 300 Appendix A (Hazardous Waste Ranking System)

<sup>13</sup> 42 U.S.C. § 9604(a); 40 C.F.R. § 300.425(b)

<sup>14</sup> 42 U.S.C. § 9604(c)(1)

<sup>15</sup> 42 U.S.C. § 9604(c)(1)

<sup>16</sup> Environmental Protection Agency, *Comprehensive Environmental Response Cleanup and Liability Information System* database, available at <http://cfpub1.epa.gov/supercpad/cursites/srchsites.cfm> (last accessed Nov. 30, 2005); Environmental Protection Agency, *Superfund: Building on the Past, Looking to the Future*, p. 12 (April 22, 2004)

<sup>17</sup> Environmental Protection Agency, *Comprehensive Environmental Response Cleanup and Liability Information System* database, available at <http://cfpub1.epa.gov/supercpad/cursites/srchsites.cfm> (last accessed Nov. 30, 2005)

<sup>18</sup> *Ibid.*

<sup>19</sup> Probst and Konisky, *Superfund’s Future: What Will it Cost*, p. 85, Washington, D.C. Resources for the Future Press (2001) (citing U.S. Government Accountability Office, *Superfund: Extent of Nation’s Potential Hazardous Waste Problem Still Unknown*, GAO/RCED-88-44 (1987))

<sup>20</sup> 42 U.S.C. § 9607(a)

<sup>21</sup> Environmental Protection Agency Memo from John Peter Suarez to Regional Administrators, *Enforcement First for Remedial Actions at Superfund Sites*, Sept. 20, 2002, available at <http://www.epa.gov/compliance/resources/policies/cleanup/superfund/enffirst-mem.pdf> (last accessed Nov. 30, 2005)

<sup>22</sup> Congressional Research Service Report to Congress, *Superfund Taxes or General Revenues: Future Funding Options for the Superfund Program*, CRS-2, RL31410 (March 4, 2004)

<sup>23</sup> 26 U.S.C. §§ 9507, 4611, 4661 and 4671

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- <sup>24</sup> Probst and Konisky, *Superfund's Future: What Will it Cost*, p. 104, Washington, D.C. Resources for the Future Press (2001)
- <sup>25</sup> Environmental Protection Agency, *Federal On-Scene Coordinator's After Action Report for the Capitol Hill Site* (Aug. 2002) available at <http://www.epaosc.org/sites%5CDCN000305703%5Cfiles%5Cosc%20report.pdf> (last accessed Nov. 30, 2005)
- <sup>26</sup> Government Accountability Office, *Capitol Hill Anthrax Incident: EPA's Cleanup Was Successful; Opportunities Exist to Enhance Contract Oversight*, Page 2, GAO-03-686 (June 2003) available at <http://www.gao.gov/new.items/d03686.pdf> (last accessed Nov. 30, 2005)
- <sup>27</sup> Larson, Presentation at IAHS Conference, *Destructive Waters: Water-Caused Natural Disasters- Their Abatement and Control*, presented in Anaheim, California (June 1996) available at [http://www.nwrfc.noaa.gov/floods/papers/oh\\_2/great.htm](http://www.nwrfc.noaa.gov/floods/papers/oh_2/great.htm) (last accessed Oct. 29, 2005)
- <sup>28</sup> Environmental Protection Agency, *EPA's Role in the Federal Disaster Response Plan Factsheet*, 550-F-95-006 (January 1995)
- <sup>29</sup> *Ibid.*
- <sup>30</sup> Federal Emergency Management Agency, *The Great Midwest Floods of 1993*, available at <http://www.fema.gov/hazards/floods/mwfld93.shtm> (last accessed Nov. 22, 2005)
- <sup>31</sup> Unless otherwise noted all site information for American Creosote Works, Inc. Superfund Site obtained from: Environmental Protection Agency, *Florida NPL/NPL Caliber Cleanup Site Summaries*, available at <http://www.epa.gov/region4/waste/npl/nplfln/acwpenfl.htm> (last accessed Nov. 21, 2005)
- <sup>32</sup> Environmental Protection Agency Region IV, Letter from David Andrews to Regional Response Center, *POLREP #1 AND FINAL*, May 9, 2003
- <sup>33</sup> *Ibid.*
- <sup>34</sup> Environmental Protection Agency, *Comprehensive Environmental Response Cleanup Information System (CERCLIS)*, available at <http://cfpub1.epa.gov/supercpad/cursites/csitinfo.cfm?id=0400572> (last accessed Nov. 21, 2005)
- <sup>35</sup> Unless otherwise noted all site information for Bunker Hill Mine and Metallurgic Superfund Site obtained from: Environmental Protection Agency, *Comprehensive Environmental Response Cleanup Information System (CERCLIS)*, available at <http://cfpub1.epa.gov/supercpad/cursites/csitinfo.cfm?id=1000195> (last accessed Nov. 21, 2005)
- <sup>36</sup> Steele, *Cleanup Results Murky*, *The Spokesman-Review* (Tuesday July 23, 2002)
- <sup>37</sup> Environmental Protection Agency, *Superfund Fact Sheet: Bunker Hill*, p. 3 (January 14, 1998)
- <sup>38</sup> Agency for Toxic Substances and Disease Registry, *ToxFAQs for Lead*, available at <http://www.atsdr.cdc.gov/tfacts13.html> (last accessed Nov. 30, 2005)
- <sup>39</sup> Environmental Protection Agency, *Superfund Fact Sheet: Bunker Hill*, p. 4 (January 14, 1998).
- <sup>40</sup> *Ibid.*
- <sup>41</sup> Steele, *Cleanup Results Murky*, *The Spokesman-Review* (Tuesday July 23, 2002).
- <sup>42</sup> *Ibid.*
- <sup>43</sup> *Ibid.*
- <sup>44</sup> *Ibid.*
- <sup>45</sup> Environmental Protection Agency Inspector General, *Response to Senate Environment and Public Works Committee on Funding Needs for Superfund Sites*, Oct. 25, 2002; Environmental Protection Agency Inspector General, *Congressional Request on Funding Needs for Non-Federal Superfund Sites*, Report 2004-P-00001 (Jan. 7, 2004) available at <http://www.epa.gov/oig/reports/2004/20040107-2004-p-00001.pdf> (last accessed Nov. 20, 2005); Environmental Protection Agency, *New Construction Fact Sheets: Sites Not Receiving FY 2004 New Construction Funding*, available at <http://www.epa.gov/superfund/accomp/factsheets04.htm> (last accessed Nov. 30, 2005)
- <sup>46</sup> Unless otherwise noted all site information for South 8<sup>th</sup> Street Landfill Superfund Site obtained from: Environmental Protection Agency, *EPA Superfund Record of Decision: South 8<sup>th</sup> Street Landfill*, EPA/ROD/R06-94/089 (1994), available at <http://www.epa.gov/superfund/sites/rods/fulltext/r0694089.pdf> (last accessed Nov. 21, 2005)

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- <sup>48</sup> Environmental Protection Agency, *NPL Site Narrative for South 8<sup>th</sup> Street Landfill*, Feb. 7, 1992, available at <http://www.epa.gov/superfund/sites/nplsnl/n0600184.pdf> (last accessed Nov. 30, 2005)
- <sup>49</sup> 69 Fed. Reg. 45,597 (July 30, 2004) (Notice of Intent for site deletion)
- <sup>50</sup> Unless otherwise noted all site information for the Lower Darby Superfund Site obtained from: Environmental Protection Agency, *Lower Darby Creek: EPA Investigates Lower Darby Creek*, available at <http://www.epa.gov/reg3hwmd/super/sites/PASFN0305521/fs/1999-08.htm> (last accessed Nov. 21, 2005)
- <sup>51</sup> Environmental Protection Agency, *Lower Darby Creek: Current Site Information*, available at <http://www.epa.gov/reg3hwmd/npl/PASFN0305521.htm> (last accessed Nov. 21, 2005)
- <sup>52</sup> Health-Track, *A Health-Track Case Study of Pennsylvania: Eastwick and the Lower Darby Creek Area*, p. 1 (Aug. 7, 2001).
- <sup>53</sup> *Ibid.* at 2
- <sup>54</sup> *Ibid.*
- <sup>55</sup> 66 Fed. Reg. 32,235 (June 14, 2001)
- <sup>56</sup> Environmental Protection Agency, *Lower Darby Creek: Current Site Information*, available at <http://www.epa.gov/reg3hwmd/npl/PASFN0305521.htm> (last accessed Nov. 21, 2005)
- <sup>57</sup> Unless otherwise noted all site information for the Mohawk Tannery Superfund Site obtained from: Environmental Protection Agency, *NPL Site Narrative for Mohawk Tannery*, available at <http://www.epa.gov/superfund/sites/npl/nar1589.htm> (last accessed Nov. 21, 2005)
- <sup>58</sup> Environmental Protection Agency, *Mohawk Tannery*, available at [http://yosemite.epa.gov/r1/npl\\_pad.nsf/51dc4f173ceef51d85256adf004c7ec8/321261260630d12b852569e7006d885c!OpenDocument](http://yosemite.epa.gov/r1/npl_pad.nsf/51dc4f173ceef51d85256adf004c7ec8/321261260630d12b852569e7006d885c!OpenDocument) (last accessed Nov. 21, 2005)
- <sup>59</sup> Unless otherwise noted all site information for the Callahan Mine Superfund Site obtained from: Environmental Protection Agency, *Callahan Mining Corp.*, available at [http://yosemite.epa.gov/r1/npl\\_pad.nsf/51dc4f173ceef51d85256adf004c7ec8/1cdd147450089bb585256aca005551e9!OpenDocument](http://yosemite.epa.gov/r1/npl_pad.nsf/51dc4f173ceef51d85256adf004c7ec8/1cdd147450089bb585256aca005551e9!OpenDocument) (last accessed Nov. 21, 2005)
- <sup>60</sup> 67 Fed. Reg. 56,757 (Sept. 5, 2002)
- <sup>61</sup> Environmental Protection Agency Administrative Order by Consent for Remedial Investigation and Feasibility Study, *In The Matter of Callahan Mine Superfund Sites, Brooksville, ME*, CERCLA-01-2005-0022 (July 7, 2005)
- <sup>62</sup> *Ibid.*
- <sup>63</sup> Unless otherwise noted all site information for the Southern Maryland Wood Treating Superfund Site obtained from: Environmental Protection Agency, *Record of Decision: Southern Maryland Wood Treating*, EPA/ROD/R03-95/197 (Sept. 8, 1995) available at <http://www.epa.gov/superfund/sites/rods/fulltext/r0395197.pdf> (last accessed Nov. 21, 2005)
- <sup>64</sup> Agency for Toxic Substances and Disease Registry, *ToxFAQs*, available at <http://www.atsdr.cdc.gov/tfacts85.html> (creosote); <http://www.atsdr.cdc.gov/tfacts51.html> (PCP) (last accessed Nov. 30, 2005)
- <sup>65</sup> Environmental Protection Agency, *Southern Maryland Wood Treating Remedial Action Report, August 2001*, available at [http://www.epa.gov/reg3hwmd/super/sites/MDD980704852/reports/2001-08\\_remedial-action.pdf](http://www.epa.gov/reg3hwmd/super/sites/MDD980704852/reports/2001-08_remedial-action.pdf) (last accessed Nov. 21, 2005)
- <sup>66</sup> Environmental Protection Agency, *Southern Maryland Wood Treating Remedial Action Report, August 2001*, available at [http://www.epa.gov/reg3hwmd/super/sites/MDD980704852/reports/2001-08\\_remedial-action.pdf](http://www.epa.gov/reg3hwmd/super/sites/MDD980704852/reports/2001-08_remedial-action.pdf) (last accessed Nov. 21, 2005)
- <sup>67</sup> Environmental Protection Agency Environmental News, *Former Toxic Wood Treating Site Now Clean and Ready for Reuse, EPA to Remove Hollywood Site from Superfund List* (Feb. 4, 2005), available at <http://www.epa.gov/reg3hwmd/super/sites/MDD980704852/pr/20050204.pdf> (last accessed Nov. 21, 2005); Environmental Protection Agency, *Final Close Out Report, Southern Maryland Wood Treating* (Feb. 2,

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<sup>68</sup> Unless otherwise noted all site information for the Gurley Pit Superfund Site obtained from: Environmental Protection Agency, *Record of Decision Gurley Pit Operable Unit 01*, EPA/ROD/R06-87/022 (Oct. 6, 1987) available at <http://www.epa.gov/superfund/sites/rods/fulltext/r0687022.pdf> (last accessed Nov. 21, 2005); Environmental Protection Agency, *Record of Decision Gurley Pit Operable Unit 02*, EPA/ROD/R06-88/016 (Sept. 26, 1988) available at

<http://www.epa.gov/superfund/sites/rods/fulltext/r0688016.pdf> (last accessed Nov. 21, 2005)

<sup>69</sup> 68 Fed. Reg. 62,747 (Nov. 6, 2003)

<sup>70</sup> Cone, *Toxic Threat Still Vague but Ominous, EPA Says*, Los Angeles Times (Sept. 15, 2005).

<sup>71</sup> Environmental Protection Agency, Summaries of Water and Sediment Testing, available at

<http://www.epa.gov/katrina/testresults/water/index.html> (water) and

<http://www.epa.gov/katrina/testresults/sediments/index.html> (sediment) (last accessed Nov. 30, 2005)

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