

United States
Environmental Protection
Agency

Hazardous Waste Division

Region 10
1200 Sixth Avenue
Seattle WA 98101

Superfund Branch

Alaska
Idaho
Oregon
Washington

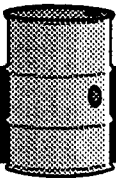
September 1991



Superfund:

Progress in Region 10





SuperFund: Progress in Region 10

Executive Summary

The purpose of this report is to provide perspective on the successes and challenges of the Environmental Protection Agency (EPA) Region 10 Superfund program. Superfund, the Federal program to clean up hazardous waste sites, is the focus of substantial activity in Region 10. Fifty of the over 1100 sites investigated by Region 10 are listed among the most hazardous in the nation.

Superfund is now an established program. Its ambitious task and unique liability scheme gave the program an extended adolescence. Now Superfund shows itself to be a strong program to protect people and the environment.

EPA has worked closely with States, communities, and other interested parties to develop effective Superfund cleanup remedies. Citizens, environmental groups, State and local officials, and industry representatives have participated in cleanup decisions. EPA Region 10 has used a variety of approaches, including newsletters, public meetings, and community workgroups, to inform and involve the public in its Superfund activities. Public involvement has contributed significantly to the successes of Region 10's program.

Region 10 Targeted Approach. The Region 10 Superfund program has aggressively moved to protect human health and the environment:

- Sites are investigated quickly and early actions are taken to protect people and the environment.
- The worst sites are addressed first, and even complicated sites are being cleaned up. Complex sites are stabilized quickly to protect human health until a complete cleanup is undertaken.
- The majority of cleanup work is financed by parties responsible for pollution at Superfund sites.

The first step in the Superfund program is to make sites safe for people and the environment. At 63 sites in the Northwest, EPA has immediately removed hazardous waste or taken other actions to stabilize and secure sites. In many cases, EPA's emergency cleanups or other immediate actions do more than provide safety -- they succeed in completely cleaning up the site.

- **Initial Investigations and Quick Cleanups Are a Priority.** *Region 10 has investigated over 1,100* sites reported to it and performed emergency cleanups at 63 sites, many of which resulted in clean sites. Over 700 of the sites reported, those not posing the most serious threats, have been referred to States for further action if necessary.*

Superfund's next step is to clean up sites, tackling the worst sites first. Site characterization is an important activity. By determining the source and pathways for exposure to people and the environment, EPA can identify the worst sites and at least stabilize them until cleanup can occur. EPA has found that by breaking large sites into a few smaller units, it can attack first the most contaminated area on-site or prevent the contamination from moving. The smaller units are more rapidly characterized, which means that cleanup can start sooner.

- **Focus on Smaller Bites for Clean Sites.** *Consistent with the national strategy for Superfund, Region 10 initiates early cleanups to reduce exposure to people and the environment. In Region 10, 23 emergency actions and 28 cleanup activities (6 initiated early to address significant threats) are underway or completed at the National Priorities List (NPL) sites managed by EPA.*

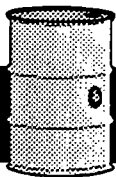
EPA uses strong enforcement to ensure that those responsible for the pollution clean it up at their own cost.

- **Superfund Leverages Cleanup by Responsible Parties.** *In Region 10, more than 50 percent of the emergency cleanups and 90 percent of the interim and final cleanups are being performed by responsible parties. Their contribution toward emergency cleanups, site studies, and cleanups is worth over \$300 million, four times what has been spent in Federal Superfund dollars.*

Hazardous waste problems created in the past 40 or 50 years cannot be cleaned up overnight. The following pages provide a brief overview of cleanup progress to date in Region 10. The structure of the report follows the Superfund cleanup process:

- **First Steps:** Investigating Threats, Quick Cleanups
- **Long-Term Cleanups:** NPL Sites
- **Enforcement:** Polluters Clean Up or Pay Up
- **Conclusion:** Superfund: Successful, Not Perfect

* All information in this report applies to EPA's Northwest Region (Region 10): Alaska, Washington, Idaho, and Oregon. The information covers Region 10 Superfund sites listed on the National Priorities List (NPL), except NPL sites managed by States and by Federal facilities, e.g., those operated by the Departments of Defense and Energy.



SuperFund: Progress in Region 10

First Steps: Investigating Threats, Quick Cleanups

Finding the Worst Problems

Over 1,100 of the 1,176 potential Superfund sites identified in the Northwest have been investigated by EPA Region 10. These sites were reported as possible threats by local governments, police or fire departments, nearby businesses, neighboring residents, or State or EPA inspectors. EPA's site investigations are comprehensive - they combine on-site sampling and inspections with detailed investigations of business records of past activities.

Fifty of these sites pose serious long-term threats, and EPA listed them on the National Priorities List (NPL). Another 63 sites have been cleaned up or stabilized by EPA

with short-term immediate work (called emergency cleanups or "removals"). Over 700 of the reported sites do not meet the criteria for listing on the Superfund National Priorities List (NPL) and are referred to State and local agencies for their appropriate follow-up, if needed.

Sites in the screening process will continue to be added to the National Priority List. New listing criteria will increase the number of sites listed because of environmental concerns.

Protecting A Community's Water Supply

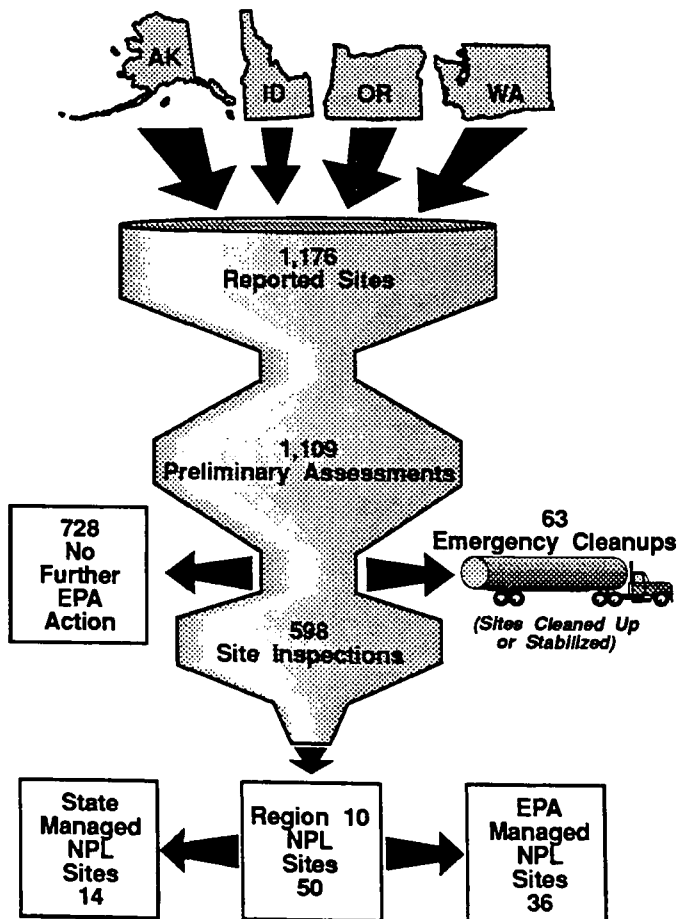
In 1981, EPA discovered that two major wells of the Lakewood Water District, which serves more than 10,000 people south of Tacoma, Washington, were contaminated with chlorinated organic chemicals. The Lakewood Water District took the wells out of production and notified its customers of the problem. Customers were requested to follow a water conservation plan.

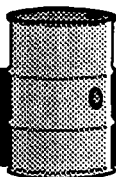
From 1981 to 1983, EPA investigated the site to determine the source of the contamination. EPA found that the contamination was coming from a commercial dry-cleaner. The State issued an enforcement order requiring the cleaner to cease dumping solvent-containing materials into the septic system.

EPA next studied treatment systems which would provide water to the water district and restrict the spread of contaminants in the aquifer. Lakewood Water District was concerned that the two shut wells were critical for providing drinking water and fire protection to 600 residents. EPA decided to construct aeration towers at the two wells to remove the organic solvents. The treated water was then distributed through the existing public water supply. The towers were constructed and in operation within six months.

Following a more detailed investigation of the soil and groundwater contamination at the site in 1985, EPA decided to add a treatment system to extract solvents from contaminated soil. The groundwater and soils treatment systems are expected to complete the site cleanup next year.

Figure 1:
Region 10 Site Reporting and Investigation
Many sites are reported. Not all require cleanup, but steps must be taken to determine how each reported site must be dealt with.





SuperFund: Progress in Region 10

Protecting People and the Environment from Urgent Threats.

EPA addresses the most urgent threats immediately. EPA's emergency crews remove hazardous materials and stabilize and secure sites. If drinking water is contaminated, EPA provides bottled water immediately and connects homes to a safe water supply as soon as possible.

While emergency cleanups are fast responses, they also can be significant efforts. Barrels with mysterious contents must be sampled, and safely removed in case of dangerous reactions or explosions. Proper disposal or recycling must also be assured before removal from the site. EPA directly and through enforcement actions has

performed emergency cleanups at 86 sites (23 at NPL sites, 63 at non-NPL sites) in the Northwest.

Many times, an emergency cleanup is all that is necessary to clean up a site. Whether for accidental spills or deliberate dumping, EPA can often remove contamination completely, especially if it is concentrated. While EPA moves quickly to remove the hazardous materials, EPA takes time to ensure the action is thorough. Emergency cleanups then result in a clean, safe site.

A typical emergency cleanup costs between \$250 thousand and \$2 million and takes from several weeks to a year to complete. In most cases, the site is then clean enough for use.

Cleaning Up an Illegal Dump

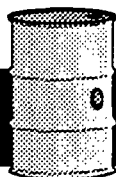
In January 1990, EPA's Office of Criminal Investigators notified Region 10's Superfund program about possible illegal disposal of hazardous waste at Ditch Creek Ranch in Wimer, Oregon. This information was forwarded from the State of Oregon Department of Environmental Quality. Superfund's site assessment discovered hazardous sludge and soils. Because of high levels of lead and copper, the site was determined to present an imminent threat to human health and the environment.

The emergency cleanup began with a community meeting that led to an investigation of the whole ranch. Due to previous gold mining in the area, it was difficult to distinguish between mining disturbances and disturbances caused by illegal disposal of hazardous waste. Site activities included testing of 16 domestic wells to ascertain the threat posed to neighbors, 117 soil samples, 42 surface water samples, electromagnetic surveys, ground penetrating radar, xray florescence, aerial photo interpretation, and surface geology. Most of these activities were conducted between April and August, 1990.

In September, EPA authorized emergency cleanup actions to address the contaminated areas. The owner of the ranch, who also owned Rogue Valley Circuits, a printed circuit board manufacturing and electroplating company, agreed to perform further studies on the extent of contamination, to remove the waste, and clean up the site under EPA Order and supervision.

Emergency cleanup activities began in November 1990. Soil was excavated, debris sorted out, and all contaminated material removed. The dump area was covered with hay and planted with seeds and conifer saplings for slope stabilization. Wastewater generated during cleaning and decontamination was transported to a licensed facility. Since the ranch includes the recharge area for the local drinking water aquifer, groundwater monitoring was installed for regular sampling. The neighboring wells have yet to show contamination. A total of 35 truckloads of soil, and 5 truckloads of debris, were removed, treated, and disposed at a hazardous waste landfill. The last truck left the site in January, 1991.

On May 28, 1991, the PRP was found guilty of illegal transport and disposal of hazardous waste and penalized almost \$1 million. This included \$960,000 for the cleanup and a criminal fine of \$20,000.



SuperFund: Progress in Region 10

Long-Term Cleanups: NPL Sites

Fifty sites listed on the NPL are in EPA Region 10 (excluding Federal facilities). Consistent with EPA's history of a strong Federal-State partnership, States have assumed management of 14 of these sites, the majority in the State of Washington. The long-term cleanup of these NPL sites includes: (1) a comprehensive study of the contamination and the technologies to clean it up; (2) the design of the chosen technology, and (3) the construction and operation of the treatment system. Contaminated soil and groundwater may take many years of treatment until a site meets cleanup standards.

In Region 10, many sites are well on the way to cleanup. Region 10 and responsible parties have completed or are conducting 66 site investigations and 28 separate cleanup actions at the 36 sites managed by EPA.

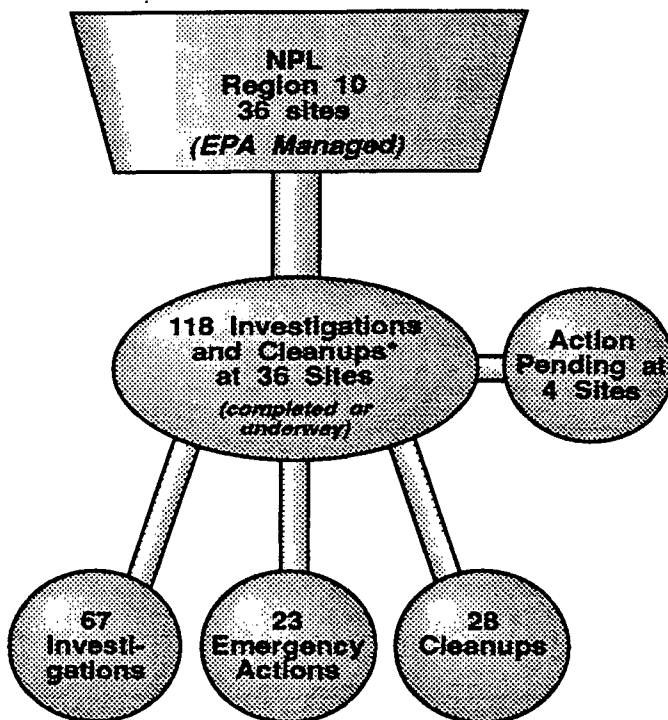
In all, 31 of the 36 NPL sites managed by EPA are actively being worked on. Of the four sites where action is pending, three were just listed on the NPL in August, 1991. One of the 36 sites is completely clean, verified by final sampling, and the site is no longer on the NPL.

Mega-Sites

Region 10 has been aggressive in listing very large sites on the NPL in special circumstances. These "mega-sites" allow EPA to more effectively address a variety of public health and environmental problems not covered by other State or Federal laws. However, these sites also present management and communication challenges, since site investigation or cleanup may occur simultaneously at different units of the site. The Superfund program is generally designed to deal with relatively small discrete problems, such as abandoned and leaking drums of toxic waste. In Region 10, we have listed several of these "mega-sites" on the NPL:

- Commencement Bay (Tacoma, Washington)
- South Tacoma Channel (Tacoma, Washington)
- Eagle Harbor (Bainbridge Island, Washington)
- Harbor Island (Seattle, Washington)
- Bunker Hill (Silver Valley, Idaho)

Figure 2:
Region 10 NPL Site Cleanups



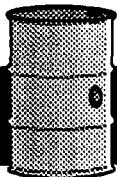
* Shows activities underway or completed. In Region 10, several large or complex NPL sites are managed as more than one cleanup site.

Significant action has taken place at 32 of 36 NPL sites under EPA jurisdiction.
(including one NPL deletion)

Smaller Bites for Clean Sites

Region 10 is breaking mega-sites and other Superfund sites into smaller, more manageable pieces. It often makes sense to identify parts of the larger site where early cleanups can be done to greatly reduce public or environmental exposure. Contamination in these areas is easier to characterize and the cleanup remedy is easier to design and implement. This means actual cleanup can start sooner and progress more efficiently. This also means that Region 10 can work on the worst sites first, consistent with the national strategy for Superfund.

Another result is that the number of sites Region 10 deals with is significantly larger than the 36 EPA-managed sites on the NPL. For example, the Tacoma Tar pits site is an independent cleanup unit within the larger Commencement Bay site. The Tar pits is a 30 acre site containing coal gasification wastes, lead, and PCBs. Each cleanup unit presents unique technical and legal challenges.



SuperFund: Progress in Region 10

Early Cleanups Make Sites Safe in the Interim

Not all NPL cleanups need to wait for completion of the comprehensive site study. EPA tackles the worst problems at each site first, often beginning some early cleanup action while site studies are still underway. EPA Region 10 reviews NPL sites to determine whether an emergency cleanup or interim action is necessary to make the site safe until final cleanup can occur. Interim cleanup actions tend to be larger-scale activities to stabilize the site. Many times

emergency or interim cleanup actions are performed by the responsible parties. To date, 23 emergency response actions have been initiated or completed to control immediate threats at NPL sites. In addition, of the 28 cleanup actions described above, 6 were interim cleanup actions performed by EPA Region 10 or responsible parties. These early cleanups ensure that NPL sites pose no immediate threats to public health or the environment, and they speed up the long term cleanup of the sites.

Early Cleanup at an NPL Site

The Commencement Bay South Tacoma Channel site covers 2.5 square miles in Tacoma, Washington. The site includes three major cleanup areas, one of which is a drinking water wellfield. Well 12A is the principal well of the 13 wells used by Tacoma to meet peak summer and emergency water demands. A production well, it can produce 5 million gallons per day. The well was removed from service in 1981 when the City of Tacoma found chlorinated solvents contaminating the well. EPA proposed the site for listing in 1981 and listed it in 1983.

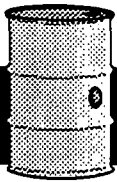
Studies of the wellfield area in 1982 showed that Well 12A was contaminated by previous nearby activities, including waste oil and solvent reclamations processes. Because of Tacoma's reliance on Well 12A, the City requested that action occur as soon as possible. In January 1983, EPA evaluated treatment options. In March, EPA selected a large five tower air stripping unit. Design and construction followed immediately. Operation began in July 1983. Well 12A, whose treated water now met drinking water standards, was returned to service. While the site itself needed further cleanup, Tacoma could once again rely on Well 12A.

Cleanup activities continued. Site studies of other areas demonstrated the extent of the contamination and the sources. This enabled EPA to pursue litigation against responsible parties, take action to prevent further contamination, and address cleanup of the entire site.

Litigation against Burlington Northern Railroad, owner of one of the properties contaminating Well 12A, resulted in a 1985 settlement whereby Burlington Northern agreed to excavate and dispose of contaminated soil at a cost between \$500,000 and \$1 million. Litigation against Time Oil Company, the owner of another property contaminating Well 12A, was settled in 1988 for \$8.5 million. The litigation uncovered other responsible companies. EPA is pursuing them also for their share in cleanup costs.

While pursuing litigation, EPA took actions to halt the spread of contamination and undertake long-term cleanup of the site. To prevent further migration of contaminants toward Well 12A, EPA constructed a carbon adsorption groundwater treatment system near the Time Oil property. The system began operation in 1988 and its successful continuous operation has kept the plume in check. Over 200 million gallons of groundwater have been treated and over 7,500 pounds of organic chemicals removed to date. Contaminant levels between the system and Well 12A have been reduced by two orders of magnitude and levels in Well 12A by one-fifth.

EPA will install the final cleanup measure, a soil aeration system, this fall. A network of 23 vacuum extraction wells will be hooked up to blowers. Air will pass through contaminated soil, evaporating the solvents. The contaminated air will be captured in the vacuum wells and treated aboveground to recover the solvents. Final site cleanup is expected to be complete in 1997.



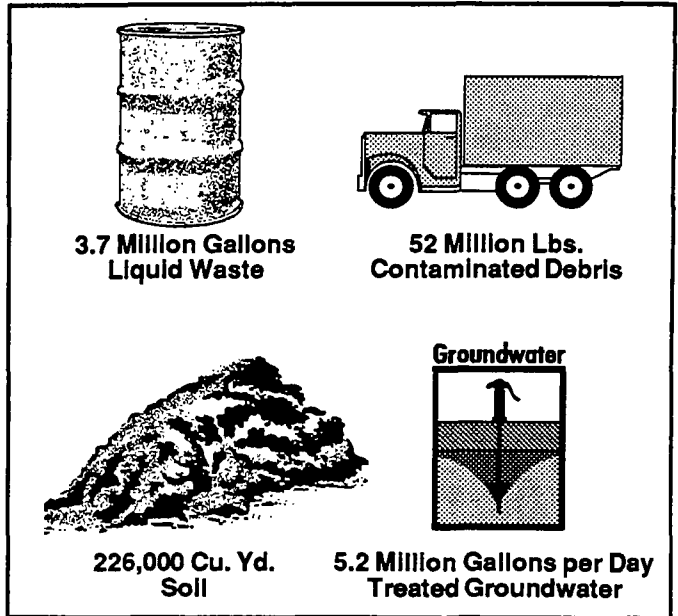
SuperFund: Progress in Region 10

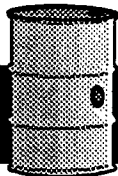
Cleanups Involve Large Quantities of Toxic Waste

Cleanups frequently entail removing hazardous materials from the site, emptying lagoons of hazardous liquids, dealing with large volumes of contaminated soil, proper disposal of these materials, building water treatment units and temporary storage facilities, or bringing in mobile incineration units. Even at small sites, these activities can be major construction projects.

Large quantities of contaminated material must be addressed at Superfund sites. Once hazardous material contaminates soil, surface water, or groundwater, the soil or water frequently becomes hazardous material as well. Over time, the contamination may spread across large areas, all of which is addressed in the cleanup. One indicator of Region 10's cleanup progress is the enormous volume of hazardous material treated or removed from Superfund sites.

Figure 3:
Region 10 Cleanups Address Contamination
Estimated Amount of Hazardous Materials Treated or Removed from Sites (through September 1990)



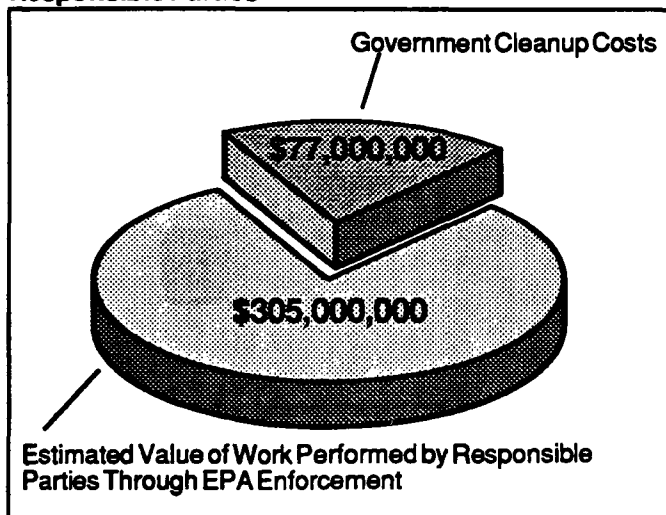


SuperFund: Progress in Region 10

Enforcement: Polluters Clean Up or Pay Up

The very name "Superfund" conjures up a picture of publicly funded cleanups financed by the special Superfund taxes. But EPA has been remarkably effective at using enforcement to produce far more cleanup work by responsible parties than would be possible using just public funds. In Region 10, for every dollar that has been spent from public funds, responsible parties have spent four dollars on cleanup work under EPA enforcement orders or judicial decrees. Region 10 Superfund enforcement has resulted in \$305 million of cleanup and investigation.

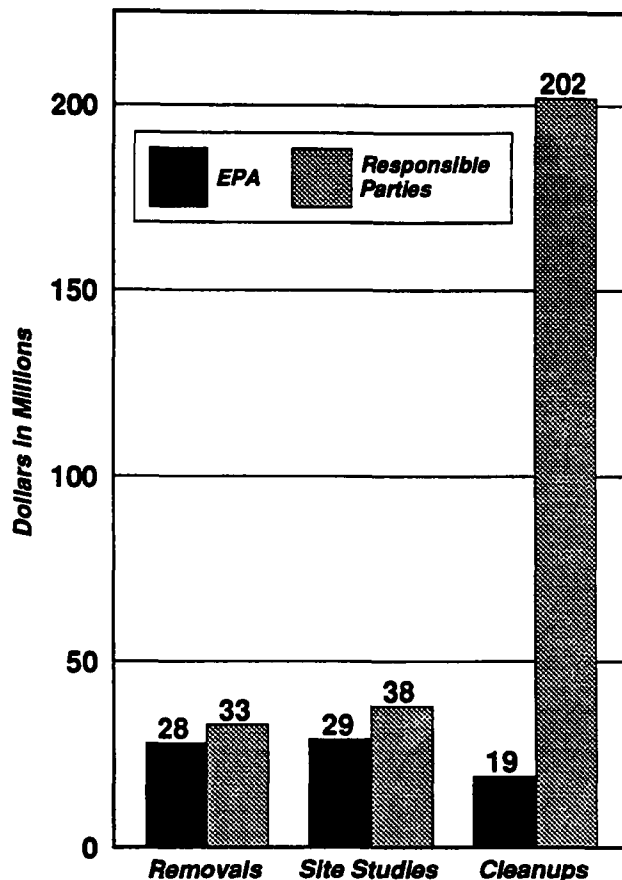
Figure 4:
Region 10 Superfund Dollars Leverage Cleanup by Responsible Parties*



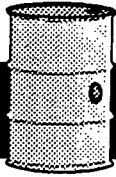
* Includes removals, site studies, cleanups, and miscellaneous costs reimbursed or paid in advance to EPA

Region 10 has been successful in obtaining responsible party cleanups. Region 10 uses its Superfund resources to focus on emergency cleanups, where the need for speed is greatest, and on site studies, often establishing the basis for later negotiations with responsible parties. As shown in the graph following, responsible parties have then supplied more than 90 percent of the resources for NPL site cleanups, the most expensive step in the process.

Figure 5:
Responsible Parties Pay for Cleanups in Region 10



When EPA cannot persuade responsible parties to perform removals or long-term cleanups, EPA uses Superfund to ensure that progress toward cleanup at the site continues. EPA closely documents its expenditures at the site, including overhead. EPA then sues responsible parties to recover these costs. Region 10 has been very successful in its efforts to recover its costs. In addition to the cleanup cost shown in Figure 5, responsible parties have also reimbursed the Federal government \$20 million for emergency cleanups, site studies, cleanups, and EPA oversight to date. In addition, responsible parties have paid \$12 million in advance toward EPA cleanups.



SuperFund: Progress in Region 10

Conclusion Superfund: Successful, Not Perfect

Region 10's Superfund program has significant successes to its credit:

- Preliminary investigation of 94 percent of the over 1,100 sites reported to Region 10 to date.
- Responsible parties paying for 90 percent of interim and final Superfund site cleanups in Region 10.
- Cleanup efforts targeted to addressing the most significant threats to people and the environment, with 29 early cleanup actions (23 emergency cleanups and 6 interim cleanup actions) underway or completed at the 36 NPL sites managed by EPA.

Despite this progress, Region 10 still faces a number of challenges: large and complex sites; complex technical and legal issues; reducing contractor overhead costs; and continuing an aggressive program to address the worst site problems first and to ensure that responsible parties pay their fair share of cleanup costs.

Region 10 is committed to maintain its successful efforts, and to aggressively address problems as they are identified. We will continue to work with States, affected communities, responsible parties, and others as appropriate to develop timely and effective Superfund cleanups. Looking ahead, Region 10 will continue to look for new ways to speed up the Superfund investigation and clean up process, improve contracts management, and continue a strong enforcement program, including dealing fairly and effectively with smaller responsible parties.

Setting the Record Straight

The Superfund program has received much scrutiny. Some concerns are valid and EPA is working to improve the program. Others may be based on incomplete information or reflect a lack of understanding of complex legal and technical issues.

"Superfund Spends Lots of Money, But Nothing Ever Gets Cleaned Up"

- *Just counting deletions from the National Priorities List does not tell the whole story.*
- *There are 28 cleanups completed or in progress here in Region 10 alone.*
- *Although there is only one deletion from the National Priorities List in Region 10 and only 36 nationally, deletions do not measure progress in site cleanup. Many NPL sites involve contaminated groundwater which can take years to correct, even when all other work at the site is completed. EPA established very stringent criteria for deletions, including careful study and public comment.*
- *EPA continues to push forward to clean up the most hazardous parts of Superfund sites first.*

"Superfund Is Not Making the Polluter Pay for Cleanup."

- *In Region 10, for every dollar that has been spent from public funds, responsible parties have spent four dollars on investigation or cleanup work through EPA enforcement.*
- *Responsible parties have contributed 90 percent of the costs of NPL site cleanups in Region 10.*

"Too Much of Superfund Goes to Pay Contractors"

- *Region 10 is paying higher than anticipated contractor overhead costs, due to an enforcement program that has been very successful, resulting in significant cleanup by responsible parties.*
- *Several years ago, EPA signed contracts with cleanup firms for work financed by Superfund taxes. These contracts guaranteed a minimum amount of work to the contractors, based on EPA's experience that Superfund would have to be used to clean up most sites.*
- *Since the contracts were signed, EPA enforcement has encouraged responsible parties to step forward at an unprecedented rate, resulting in less contractor work.*
- *EPA must still pay contract overhead costs, because of the terms of the contracts. EPA is actively working to cut these costs - one price of enforcement success.*

"Can Groundwater Really Be Cleaned Up?"

- *The Superfund program spends a considerable amount of time and money in cleaning up and protecting groundwater sources for future generations. Thousands of pounds of contaminants have been removed from important aquifers.*
- *Improving the effectiveness of techniques to clean up aquifers is the subject of intense EPA research.*
- *The standard method to clean polluted groundwater is to install a well to pump and treat the water, releasing it to drinking water systems, rivers, or back to the aquifer. This process does effectively clean the treated water. However, it is not as effective at cleaning up the aquifer itself. Some of the contaminants tend to stick to the rock or soil of the aquifer. Cleaning the aquifer is somewhat like cleaning soap out of a sponge; it requires a lot of rinsing. Right now, it can easily take 20 years to "rinse" an aquifer, and some will never be totally clean. EPA will continue to search for improvements to this technology.*

"Superfund Is Overkill. The Time and Money Just Aren't Worth It."

- *Some people feel this way, especially those that are asked to pay for cleanups because of their past involvement at a site.*
- *Congress placed stringent cleanup criteria on Superfund sites when the law was reauthorized in 1986. These cleanup standards are intended to ensure that Superfund sites are as clean as possible, and that public health is protected. EPA typically is required to clean sites to a point where the threat of disease, especially cancer, is virtually eliminated.*
- *People who live near Superfund sites generally feel that cleanup is worth the cost to protect their health.*